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EANINGS IN THE FIELD OF THYROID SURGERY

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A REMARKABLE quickening of interest in diseases of e thyroid gland has been witnessed in this country ring the last two decades. In it the workers at the ew End thyroid clinic, founded by Sir Thomas Dunhill 1932, have been privileged to play a part; and it is the hope of maintaining the interest which has been roused that we now present the case-records of a few f the 3000 goitre patients whom, between us, we have d under our care at New End and elsewhere. Some, e think, illustrate the drama inherent in thyroid surgery hich appealed so much to the late Cecil Joll, once r colleague; some, we hope, may interest other workers the thyroid field. In spite of our long experience in eating patients with toxic goitre we do not claim any pecial knowledge of the workings of the gland. We re, first and last, clinicians who, knowing its many and omplex relationships with other endocrine glands, ever cease to be surprised by the success achieved simply hrough its subtotal removal. We have seen many undreds of sick people—some of them very sick people —restored to health by operation, and this with a ortality-rate of a fraction of one per cent. We have eliberately adopted the anecdotal method in recording e cases and have omitted irrelevant details likely to rove tiresome. Our comments are mostly based on sonal experience.

THYROID CRISIS FOLLOWING TONSILLECTOMY

A generation ago, in what we call the pioneering days of yroid surgery, one of us saw a girl, aged 18, who presented e classical symptoms and signs of mild Graves's disease. nce the tonsils were large and septic, it was thought best at they should be removed before subtotal thyroidectomy s considered. The patient developed a thyroid crisis on after the operation and died 24 hours later.

Inquiries in various quarters which followed showed at this was not an isolated tragedy; that thyroid isis and death had followed tonsillectomy in other yrotoxic patients and had also followed other operaons, some of a comparatively trivial nature. Ever fterwards he insisted that, whenever in a thyrotoxic atient there was another condition demanding operation, e goitre—save in circumstances of dire necessity— hould be dealt with first. Later this became the unvaryng rule at New End, and F. H. Lahey, chief of the amous *thyroid* clinic in Boston, U.S.A., told us recently n private conversation that there, even now in the days f thiouracil, the same rule obtains—"always the yroidectomy first."

It is generally believed that postoperative thyroid isis only occurs in severely toxic patients. Though is is usually so, there are exceptions. The cause of hyroid crisis we do not know. Joll used to say that he new neither its cause nor its treatment and, contrary o current opinion, held that it was not due to hyrotoxicosis.

MALIGNANT PIGMENTED PAPILLOMATOUS GROWTH OF THYROID, WITH PIGMENTED SATELLITES

In 1935 a woman, aged 40, was transferred from the etropolitan Hospital to New End as probably suffering n a pigmented malignant papillomatous growth of the oid, in view of the fact that a small hard tumour—one everal palpable in the anterior triangles of the neck—which had been removed for biopsy had shown such a structure on section, and the thyroid was, on palpation, hard and nodular. Operation revealed a thyroid infiltrated with darkly pigmented growth, and several pigmented satellites. Practically the whole of the thyroid was removed, together with every satellite that could be found. After the operation wound had healed the affected area was treated with deep X rays. When seen thirteen years later there was no recurrence.

This is the only case of a pigmented malignant neoplasm of the thyroid we have met, though a number of such cases have been published at various times in different parts of the world.

TUBERCULOSIS OF THE THYROID

In 1935 a girl, aged 22, was admitted to New End with what appeared to be an ordinary "primary" toxic goitre. A subtotal thyroidectomy was followed by the expected temporary reactionary rise of temperature, and the patient was discharged some ten days after operation. To our surprise the pathological report, received some time later, described not only thyrotoxic changes in the removed gland tissue but also granulomatous tubercles.

In 1939 a girl, aged 25, was admitted with a medium-sized nodular goitre, definite though not severe thyrotoxic symptoms, and a basal metabolic rate (B.M.R.) of + 40. She was taken to be an ordinary case of moderately toxic nodular goitre; a subtotal thyroidectomy was followed by no complications; and she was discharged ten days later. In her case, too, the pathologist reported granulomatous tubercles in the removed tissue.

In 1938 we saw a very different type of case—a man, aged 26, who had previously been treated in a sanatorium for pulmonary tuberculosis and whose X-ray film showed infiltration of both apices, more extensive on the right side. Tubercle bacilli were present in the sputum, but there was no pyrexia. For two months he had been complaining of huskiness of the voice and pain in the right side of the neck. A hard nodular tumour was felt in the right lobe of the thyroid. After observation we came to the conclusion that we were probably dealing with a case of carcinoma of the thyroid in a patient with pulmonary tuberculosis. At operation a cold abscess was discovered in a deeply placed hard nodular lobe adherent to the cricoid cartilage and showing small tubercles on its exposed surface. The lobe was removed in toto. The reactionary pyrexia was very mild and lasted only forty-eight hours. The pathological report described not only fibrocaseous and granulomatous tuberculosis of the thyroid but also thyrotoxic appearances. The patient was later handed over to the care of the tuberculosis authorities.

Perusal of the published reports reveals an extraordinary divergence of views as to the frequency of tuberculosis of the thyroid in the absence of general tuberculosis. We, for our part, are convinced that it is a rare condition since Joll told us, a short time before he died, that in his 9600 thyroidectomies he had never met a case. It is such cases as these that prove the necessity of a pathological examination of every goitre removed. In addition to these cases of tuberculosis of the thyroid at least 2 cases of unsuspected early cancer have been discovered at New End by this means.

It is interesting to note that a granulomatous infiltration seems capable of causing thyrotoxic changes in the gland.

CEREBRAL EMBOLISM RESULTING FROM PAROXYSMAL AURICULAR FIBRILLATION DUE TO GOITRE WITH NO OVERT SYMPTOMS OF THYROTOXICOSIS

In 1936 a woman, aged 36, with auricular fibrillation and a hemiplegia of recent origin was transferred from another L.C.C. hospital to New End because she had also a large nodular goitre. There was no history of acute rheumatism, and there were no signs of mitral stenosis. Apart from the auricular fibrillation there was no evidence of thyrotoxicosis, and the patient stoutly maintained that she had been in good health until the onset of the hemiplegia. Soon after her admission to New End the cardiac rhythm returned to normal spontaneously. A subtotal thyroidectomy was done, and there had been no further attacks of auricular fibrillation when we had news of her some years later. Unfortunately there had been little improvement in the hemiplegia.

Some 20 years ago a woman, considerably younger than the previous one, came to the casualty department of another hospital in a like condition. By the time she had reached the ward, not only had the fibrillation disappeared but the pulse-rate was below 70. She also insisted that previously she had been in good health. An unsuspected nodular goitre was discovered and a subtotal thyroidectomy done. She was more fortunate than the other woman, for not only was there no return of fibrillation after operation but practically all signs of hemiplegia had gone before she left hospital.

Our clinical experience over many years had long ago convinced us that, at any rate in this country, by the time early middle life is reached, the large majority of patients with goitres are thyrotoxic to some extent. Recently we have surveyed about 1400 case-records of unselected goitre patients at New End and have compared the clinical findings with the pathological. In patient after patient of early middle age or older, in whom there had been no clinical evidence of thyrotoxicosis before operation, definite evidence of thyrotoxic changes was revealed by section of the excised gland. Goitres in which there was no evidence whatever of thyrotoxic change were rare in comparison. We realise that the histological diagnosis of thyrotoxicosis is less accurate than the clinical, but it affords, none the less, very valuable evidence.

It seems certain that an attack of auricular fibrillation is occasionally the first recognisable sign of toxic change in a goitre.

It is of the utmost importance to consider the possible presence of a toxic goitre in any patient with auricular fibrillation the cause of which is not clear.

Auricular fibrillation due to toxic goitre is almost always paroxysmal at first and only later becomes established. This is fortunate, for one can at this stage practically promise a non-recurrence of the attacks after operation.

Embolism is in our experience surprisingly uncommon in paroxysmal fibrillation, though it does occur.

If all nodular goitres, "toxic" and "non-toxic" alike, were operated on without undue delay—as we hold they should be—the incidence of auricular fibrillation would be materially reduced.

NOVEL METHOD OF TREATING FEMORAL EMBOLISM RESULTING FROM AURICULAR FIBRILLATION DUE TO TOXIC GOITRE

In 1937 a woman, aged 65, was admitted to New End with a toxic goitre of many years' standing, auricular fibrillation, and congestive failure. After due preparation a subtotal thyroidectomy was done. Three days after operation an embolus, almost certainly originating in the left auricle, lodged in the right common femoral artery at the origin of the deep femoral artery. There was acute pain in the leg, which became mottled, cold, and pulseless, movement was limited, and sensation to touch was diminished. Pulsation of the femoral artery was felt at the level of Poupart's ligament but not below. Under local anæsthesia an incision was made down to the artery for an embolectomy. Palpation of the embolus resulted, to the surgeon's dismay, in its sudden disappearance. Almost immediately, however, there was a return of pulsation of the popliteal and tibial arteries, with flushing and warmth of the limb, which became free from pain. Movements gradually returned. Three days later an embolus lodged at the same level in the left femoral artery. This time the vessel was exposed and the embolus deliberately broken up with the fingers and milked away. The patient was discharged four weeks later, able to walk strongly and with good pulsation of the tibial arteries. The rhythm of the heart had meanwhile returned to normal spontaneously. When seen recently, twelve years after leaving hospital, the patient was in excellent health.

In 1946 another woman, also aged 65, was admitted to New End in a similar condition. An embolus lodged in the left femoral artery six days after admission, and before operation. The artery was exposed, and, with our previous experience in mind, the embolus was digitally broken up
and milked away, with an immediate change of colou
sensation of warmth in the limb as well as a return of
of the popliteal and tibial arteries. Strange to say, te
later not only did another embolus lodge in the same
but also one lodged in the right femoral artery. The
manœuvre was used as before, with the result that circ
in both legs apparently returned to normal. Ten
later, however, dry gangrene was evident in the
phalanges of the big and second toes of the right
Meanwhile a subtotal thyroidectomy had been
This was followed by a spontaneous disappearance o
auricular fibrillation. When seen sixteen months late
patient was in excellent health, the two affected toes
completely healed after loss of the distal phalanx, an
was walking normally.

DEVELOPMENT OF EXTREME "THYROTROPIC EXOPHTHALMOS" ACCOMPANIED BY RISING BLOO PRESSURE AFTER THYROIDECTOMY

In 1938 a woman, aged 48, was admitted to New
with a goitre of moderate size and toxicity and a histo
paroxysmal auricular fibrillation. There was only a
gestion of exophthalmos at the time of admission, an
blood-pressure was no more than 130/80 mm. Hg. W
not expect any untoward symptoms to follow opera
nor were there any at first, and it was only after three m
that definite exophthalmos, with œdema of the eyelids,
noticed. Thereafter the exophthalmos and an associ
ophthalmoplegia increased rapidly; as did the level of
blood-pressure, a reading taken four months after the oper
registering 200/120. So extreme became the exophtha
and so distressing the pain, photophobia, and lacrima
that the patient was transferred to the Radcliffe Infirm
Oxford. There Sir Hugh Cairns removed the roof of
left orbit, leaving the right untouched, since, in his experi
a sympathetic retrogression of the eye on the opposite
occasionally follows decompression of one orbit. In
present case, however, there was little, if any, diminu
of the exophthalmos on either side. Three months late
view of the patient's increasing misery, the retrobulbar sp
were explored. A curved incision was made through
lower lid of one eye, and by gentle dissection a well-def
prolapsed crescentic indurated pad of fat was remo
The following week a similar pad was removed through
upper lid. The other eye was then dealt with in like man
and the final result was excellent both from a cosmetic
a visual point of view.

This operation has been repeated in 3 other pati
with good results, but cases for operation have to
selected with the greatest care, since excess of orb
fat is not present in all cases of severe exophthalm
The case we have described was one of "thyrotr
exophthalmos," so named because animal experime
suggested that it was caused by the thyrotropic horm
deriving from the anterior lobe of the pituitary gla
Now, however, it seems that in man the part played
the thyrotropic hormone is doubtful, and that it
more likely to be due to a complex disorder of
pituitary-hypothalamic system. Happily, the conditi
is not common. Such thyrotoxic patients as we ha
seen with it have all been only mildly thyrotoxic; th
we understand, is the rule. We have seen it in patien
with hypothyroidism, and in others without eviden
of either thyrotoxicosis or goitre. The exophthalm
and the ophthalmoplegia, which is often associat
with it, usually develop insidiously, but they
develop with remarkable rapidity. Most authoriti
contend that they are generally increased by subto
thyroidectomy; we do not consider that we have se
enough cases to give a worth-while opinion on th
point, especially as we have more than once seen the
develop rapidly in patients awaiting operation. Nor
our experience sufficiently large for us to give an opinio
on the value of endocrine and other medical treatme
of the condition. Recently, however, we have seen
patient who, after a subtotal thyroidectomy for nodula
toxic goitre seven years ago, developed such sever
exophthalmos and ophthalmoplegia that at one tim
orbital decompression was discussed. In spite of the

ing had no treatment, the exophthalmos has practically disappeared, though a certain degree of ophthalmoplegia remains in one eye. This is in accordance with [illegible] le by others that spontaneous [illegible] not complete cure, almost always [illegible] owever, danger to the eyes is very at. Save in the patient whose case we have described length we have not watched a rising blood-pressure ompany an increasing exophthalmos.

ONG REMISSION OF IDIOPATHIC ASTHMA FOLLOWING SUBTOTAL THYROIDECTOMY

In 1939 a woman, aged 44, was transferred from another .C. hospital to New End with the request that a complete yroidectomy should be done in view of her suffering from evere cardiac asthma" as a result of mitral stenosis and rtic incompetence (this was at a time when complete yroidectomy was being advocated by well-known American rdiologists for patients with extreme cardiac failure). It s soon discovered that, though the patient had mitral nosis and aortic *incompetence*, there was no evidence cardiac failure whatever, the attacks being those of opathic asthma, which she had had for years. She d a nodular goitre of moderate size and definite, though ild, toxicity. There were no symptoms whatever of essure on the trachea. Influenced by the trend of current rdiological opinion, we thought it wise to remove the and as completely as possible, for we felt that, quite apart om the cardiotoxic effect it must be exerting, the extreme verity and frequency of the asthmatic attacks warranted ch a procedure, since they could only lead to the early ilure of a heart already badly handicapped. Never did a tient show greater gratitude, for, to our surprise, the tacks of asthma ceased altogether, and when she was seen me years later they had not returned.

This is not an isolated happening. Shortly before e war Dr. J. H. Palmer, of McGill University, told us at a patient of his, with a toxic goitre and asthma, d a like experience; and we have just heard from a tient of ours, a woman of 52, who, after thyroidectomy 1936 for toxic goitre. which, so far as we could see, as causing no symptoms of tracheal pressure. completely lost her asthma until the beginning of this year, hen she had a short-lived relapse.

Unfortunately, thyroidectomy has not proved so ccessful in our other goitre patients with asthma, ven if some have reported considerable alleviation. o explain these successes it will almost certainly be rged that so predominant is the psychological factor the production of asthmatic attacks that any surgical peration can on occasion bring about their cessation —at any rate for a time. Again, it is, we suppose, arguable hat in the cases we have described there was, after all, ressure by the goitre on the trachea or larynx and that his, by adding to the excitement of the bronchial musculature via the vagus, became the deciding factor in the roduction of the attacks in a very nervous asthmatic abject. Unless, however, the predominant psychological ypothesis be invoked, the relief afforded by subtotal hyroidectomy to thyrotoxic patients with no symptoms hatever of tracheal pressure is not easy to explain, specially as many physiologists believe that thyroxin ensitises the sympathetic system. Plausible explanations in plenty can no doubt be adduced, but we ladly leave the problem for others to solve, in the elief that the psychological factor in asthma has been mphasised far too much, and that the full story of the athogeny of the disease has not yet been told.

IRRITATING COUGH AND ILL HEALTH DUE TO UNSUSPECTED TOXIC GOITRE

In 1940 a woman, aged 61, was seen who had had a dry rritating cough for some three years. Associated with it ad been shortness of breath on exertion, languor, easily nduced fatigue, and a considerable loss of weight. Pulmonary tuberculosis had been suspected, but specimen after specimen of such sputum as could be obtained had revealed no tubercle bacilli, and an X-ray film of the chest had shown clear lung fields. She had been seen by a well-known chest specialist, who had been unable to find any abnormality save mild emphysema. A barium swallow had also shown no abnormality. and the radiologist responsible for subsequent films of the chest had been driven finally to a tentative diagnosis of dry bronchiectasis. A "small" goitre had been noted by more than one examiner, but it had been discounted as a possible cause of the symptoms. One glance was sufficient to note that the eyes were definitely staring. and on palpation, low down and deeply placed in the neck, a moderately large nodular goitre, displacing the trachea. could be felt. After a subtotal thyroidectomy the symptoms gradually disappeared.

An irritating cough due to the pressure of a goitre —generally partly retrosternal—on the trachea is not uncommon, and it is well worth bearing this in mind when a patient complains of such a cough. As regards the suspected presence of pulmonary tuberculosis in the present case, it is common experience that the differential diagnosis between pulmonary tuberculosis and thyrotoxicosis is not always easy, since shortness of breath on exertion. languor. easily induced fatigue, and loss of weight are common in both; and, though they were absent in this patient, excessive sweating, especially at night, and slight pyrexia are not rare in thyrotoxicosis. The fact that a persistent cough can occasionally be due to a toxic goitre does not make the differential diagnosis any easier.

UNRECOGNISED THYROID CARCINOMA WITH SECONDARIES IN THE SPINE

Shortly before the war a middle-aged woman was seen by one of us. A few months previously she had been seen by a cardiologist because of pains across the front of the chest and in the back. After a careful examination. which included electrocardiography and screening the chest, he had hesitantly diagnosed coronary disease. Shortly afterwards the patient had begun to complain of pains in the legs also, and she had been handed over to a general physician for investigation in hospital. The physician had concluded that her symptoms were purely hysterical and had sent her home to be under the care of her own doctor. The staring eyes which confronted one on entering her room seemed to demand a palpation of the neck without more ado. An undoubted carcinoma of the thyroid was present; the pains were almost certainly due to secondaries in the spine. The patient was dead in a few weeks.

We record this case for one reason only: goitre is a very common condition and, in spite of a widespread view to the contrary, is in our opinion always a potential danger, for it may at any time become toxic; it may in consequence be responsible for the onset of auricular fibrillation; it may cause pressure symptoms. either by continued growth or by hæmorrhage into its substance; and it may—more commonly than is at present believed in this country—become malignant. Is it too much to ask that students be trained in the future to examine the neck of every patient by inspection and palpation as part of their routine examination. regardless of the presenting symptoms? Thereby, we are convinced, the cause of an appreciable amount of ill health could be discovered. Cardiologists have become increasingly aware of the importance of such an examination. The only criticism of them we make is that some have evidently not learnt to palpate low-lying and deeply placed goitres, since patients have been admitted to New End with auricular fibrillation who have previously attended cardiac clinics without their goitres having been discovered. Since most of these patients have drifted to our clinic by devious paths, we suggest that there may be a still larger number still attending cardiac clinics with unrecognised goitres.

Returning for a moment to carcinoma of the thyroid, it is still not sufficiently recognised that thyrotoxic symptoms and signs are not rarely associated with this condition even if it is doubtful if they are due to it.

TOXIC GOITRE, AURICULAR FIBRILLATION, AND FULL CONGESTIVE FAILURE: SPONTANEOUS RESTORATION OF RHYTHM A FEW HOURS AFTER OPERATION

In 1943 a woman, aged 67, was admitted to New End with a nodular goitre, severe exophthalmos, emaciation, and other signs of severe thyrotoxicosis, as well as established auricular fibrillation and full congestive heart-failure. After five weeks' preparation by rest in bed, digitalis, and, at a later stage, iodine, a subtotal thyroidectomy was done. Twelve hours after operation the rhythm of the heart was regular, and, save for an occasional extrasystole, so remained.

Auricular fibrillation in toxic goitre is commonly attributed to an actual myocardial lesion caused by excessive or disturbed secretion of the thyroid, though some cardiologists contest this view. The present case seems to support their disbelief, for it hardly seems to us possible for a myocardial lesion to be benefited to the degree we have described within twelve hours of operation; rather would one expect it to be worsened temporarily. To us, however, the whole question of auricular fibrillation in toxic goitre is puzzling. It is common for transient fibrillation to develop for the first time soon after operation; it occasionally develops for the first time during operation. On the other hand, it is common for established fibrillation to disappear a week or so after operation and, not rarely, within a few days of it, even if not as soon as in the present case. For the same operation to initiate and stop fibrillation so dramatically is so paradoxical that, in our opinion the matter deserves more consideration than it has so far received.

TOXIC GOITRE, AURICULAR FIBRILLATION, AND EXTREME HEART-FAILURE: RESTORATION OF NORMAL RHYTHM WITH QUINIDINE AFTER OPERATION

A woman, aged 46, was recently seen in desperate straits: she was orthopnœic, deeply cyanosed, and grossly œdematous; the veins of the neck were distended and pulsating; the heart was enlarged; there was auricular fibrillation, and the ventricular rate was practically uncountable; she had an enlarged tender liver, ascites, and hydrothorax. A deeply placed nodular goitre was discovered, and the conclusion reached that the cardiac condition was almost certainly thyrotoxic in origin. On large doses of digitalis and intravenous injections of mersalyl the signs of congestive failure disappeared so rapidly that in a fortnight's time a course of iodine was started. A month after her admission to hospital a subtotal thyroidectomy was done. There was little reaction, and a fortnight later an attempt was made to restore the rhythm with quinidine. In thirty-six hours it was normal, and it has so remained.

We record this case for the following reasons: (1) Thyrotoxic patients with auricular fibrillation and congestive failure are often accounted thenceforward unfit candidates for operation, whereas with careful preparation and a skilled surgeon the mortality-rate is little higher than it is in patients with neither auricular fibrillation nor failure. (2) There seems to be an idea at the moment that thiouracil is absolutely necessary in the preparation of patients with auricular fibrillation for subtotal thyroidectomy, whereas it is our experience that the large majority of patients who develop auricular fibrillation are only mildly thyrotoxic, and, when this is so, iodine is quite sufficient (we reserve thiouracil for very toxic patients). (3) A history of previous congestive failure is regarded by many cardiologists as a contra-indication to the use of quinidine to restore the rhythm in patients with auricular fibrillation. That it is contra-indicated in such circumstances in patients in whom auricular fibrillation complicates mitral stenosis we have no reason to doubt, but this is not so when the auricular fibrillation is the result of thyrotoxicosis. The case we have described is only one of a number of like successful cases we have had under our care. It is understood, of course, that the patients are first digitalised. Most thyrotoxic patients exhibit a remarkable toleran digitalis, so that large doses can be given and cont for long periods not only with impunity but, gen speaking, with excellent results. This is our experi even if it conflicts with the teaching of some well-k cardiologists.

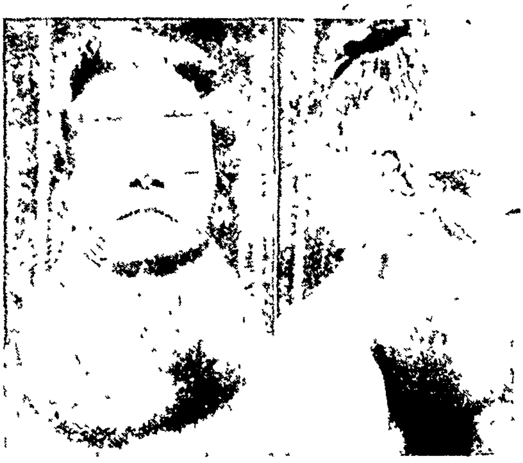

Fig. 1—Large endemic goitre which became toxic.

DOWNWARD EXTENSION OF GOITRE INTO THE POSTERIOR MEDIASTINUM

Early this year an elderly woman was admitted to End with ten years' history of gradually increasing dys on exertion and two years' history of increasing st nocturnal choking sensations, cyanosis, irritating cough, dysphagia. Such was her condition on admission that symptoms or signs of thyrotoxicosis were, if present, impo to elicit. The left lobe of the thyroid was found t enlarged and nodular, and radiography of the chest sh a large mass, partly calcified, in the posterior mediasti The cervical portion of the left lobe of the gland was exp after which the sternum was split to allow removal o prolongation, which extended downwards under the innominate vein to end in a partly calcified mass weig more than 200 g. in the situation revealed by the Pathological examination showed not only conside calcification and old and recent hæmorrhages, but thyrotoxic changes. Convalescence was stormy, but in end the patient made a good recovery.

We have dealt with many large retrosternal prolo tions of goitre. This is only one of several we found extending into the posterior mediastin Though on many occasions all preparations have made to split the sternum for removal of retroste goitres, hardly ever has the need arisen. Almost alw they can be dislocated upwards with the fingers.

ENORMOUS ENDEMIC GOITRE BECOMING TOXIC, LEAD TO AURICULAR FIBRILLATION AND DEATH

In 1936 a woman, aged 49, born and living in the Cotsw was seen with a goitre (fig. 1) so large that she suppo its weight with a shawl knotted over the top of her h The goitre had first been noticed in her teens and caused stridor for 22 years. Latterly it had grown rapi with great increase of stridor and the onset of thyrotoxic Subtotal thyroidectomy was advised, but the patient s bornly refused to consider this because her father had a large goitre and had lived to be 81 and her brother was alive with one as large as hers. The after-history was m as we expected; she soon developed auricular fibrillat which was followed by congestive failure, and she die about a year.

There seems to be an idea abroad that large ende goitres seldom become toxic. This may be the cas some parts of the world and even in some parts of country, but it is not our experience. Recently, instance, a woman from one of the Home Co was seen with a goitre as large as the one descr above, severe thyrotoxicosis, urgent stridor, auri llation, and congestive failure—she also refused ration. Again, over many years a long succession patients with endemic goitres which had become to have been sent to us from one small district in th Wales to New End for operation.

LOCALISED PRETIBIAL MYXŒDEMA FOLLOWING SUBTOTAL THYROIDECTOMY

Eighteen months after a subtotal thyroidectomy for mary toxic goitre. where the diagnosis had been corroated by pathological examination. a woman, aged 42, urned to New End complaining of great weariness. considerb increase in weight, and swelling of the lower legs, on the nt of which a growth of coarse hair had appeared during preceding six months. On clinical examination she was viously mildly myxœdematous, and this was borne out an estimation of the B.M.R. which was −19. It was the s, however. which chiefly interested us. A hard brawny dema was present in both from the feet upwards to just low the knees; anteriorly the skin looked and felt like gskin, and from it grew a thick crop of coarse hairs (fig. 2*a*). X-ray film of the pituitary fossa showed it to be shallow, t there was no evidence of erosion or deformity. The ministration of thyroid strikingly improved her general ndition but did not affect the legs. When the patient s seen eleven years later, all signs of general myxœdema d disappeared, and the legs, which (according to her) d at one time become so unsightly that she had only ntured into the streets after dark, were practically normal appearance save over a small area above each ankle, here the skin was still somewhat thickened, corrugated, d pigmented (fig. 2*b*). The patient had given up taking yroid soon after leaving hospital and had received no atment whatever afterwards.

The disappearance of the general myxœdema did t surprise us, since persistent postoperative myxœdema eding thyroid for a long time is, in our experience, re, the normal metabolic balance being almost always stored through regeneration of the thyroid tissue hich is left. The great improvement in the localised myxœdema" is another matter.

We have seen several other cases of localised pretibial yxœdema, all in patients admitted with thyrotoxicosis, t they were of a milder degree. Two followed subtal thyroidectomy, one the administration of thiouracil, d in the others the condition had developed before peration. In none of them did general myxœdema evelop. There is no known treatment for the condition hich is not a serious one and, as in the case we have escribed, may disappear spontaneously after a time.

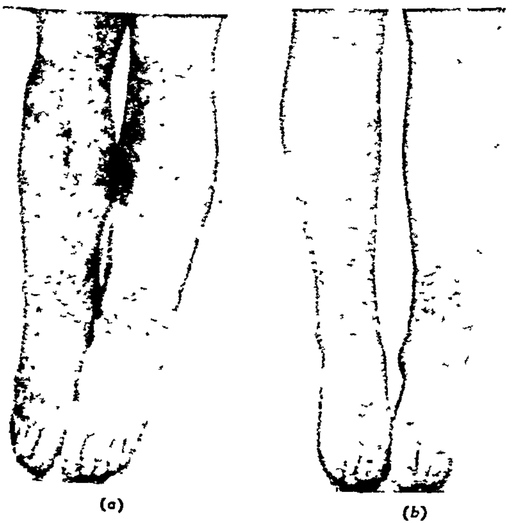

Fig. 2—Localised myxœdema developing after subtotal thyroidectomy: (*a*) eighteen months after thyroidectomy; (*b*) eleven years later.

TETANY ASSOCIATED WITH THIOURACIL THERAPY AND DISAPPEARING AFTER SUBTOTAL THYROIDECTOMY

In 1947 a woman, aged 31, was transferred from another L.C.C. hospital to New End with a history of thyrotoxicosis starting in 1938 after labour. Before transfer she had been treated with thiouracil for a year, during which time she had had several attacks of tetany accompanied by a normal blood-calcium level. After discontinuance of thiouracil and a subtotal thyroidectomy there were no further attacks. There was no question of hysteria so far as we could discover.

Dr. V. C. Medvei has made the interesting suggestion that the tetany was due to hæmorrhage into one or more of the parathyroids caused by the administration of thiouracil, which, as is well known, can cause purpuric hæmorrhage.

AGRANULOCYTOSIS DUE TO THIOURACIL DIAGNOSED AS ACUTE RESPIRATORY DISEASE

We have no wish to discuss here the much debated question of the value of thiouracil in the treatment of toxic goitre—our views have already been published. We wish merely to draw attention to the fact that only recently we have come across two patients with toxic goitre, known by their doctors to be under treatment with thiouracil. who, on their becoming desperately ill and presenting such symptoms as sore throat, pyrexia, and rigors, were sent to hospital. not as cases of agranulocytosis—which was the actual condition—but of acute respiratory disease. With the wide and, we fear, often indiscriminate use of thiouracil by medical practitioners almost from its introduction. we have for long felt certain that the numbers of cases of, and deaths from, agranulocytosis due to it are far larger than are recorded. One of our patients had been ordered one of the sulphonamides, which was only likely to interfere still further with the hæmopoietic system: he died.

RECURRENCES AFTER OPERATION

We naturally have had to deal with recurrences, some in patients operated on at New End, some at other hospitals. They are always a disappointment to patient and surgeon alike, and to the surgeon they are also a cause of considerable anxiety in view of the danger of a second operation to the recurrent laryngeal nerves and parathyroid glands. Recurrences there must be, even in the practice of the most experienced thyroid surgeon merely because the amount of gland tissue he decides to leave can only be based on his past experience, and he has no means of estimating its capacity for regrowth, since this varies with each patient. That the percentage of recurrences, however, can, and should, be materially cut down we have no doubt. The ligation of the inferior thyroid arteries in every case where they are discoverable should alone tend to bring about such a reduction—this was Joll's teaching, and its truth has been amply borne out by our experience, for we can now produce the records of a number of patients in whom the regrowth occurred only on the side where the artery had not been tied.

But there are other means at our disposal conducing to the same end. Both lobes should be exposed in every case, even when a single adenoma appears to be present, for one of the commonest causes of "recurrence" is the continued growth of a lobe unexposed at operation. Over and over again we have seen a lobe apparently normal in situ prove to contain adenomata when thoroughly exposed (such a continued growth is not strictly a recurrence, but it simulates one and is reckoned as one). And we would emphasise the necessity of removing the pyramidal lobe in its entirety in every instance, no matter how small it is. When left it often grows rapidly and can become exceedingly toxic if the original condition was one of toxic goitre. In this connexion, Dunhill, when a colleague of ours, used to say that pyramidal overgrowth in itself is good evidence of toxicity.

We wish to acknowledge our indebtedness to Sir Thomas Dunhill, Mr. Geoffrey Keynes, and the late Mr. Cecil Joll, at one time or another our co-workers at New End, who were responsible for the operations on some of the patients whose case-records we have used in this paper. We also wish to thank Dr. Clark Nicholson, of Moreton-in-Marsh, for the photographs illustrating his case and Dr. Hugh Dunlop for his valuable criticisms.

ACTION OF HETRAZAN ON FILARIASIS AND ONCHOCERCIASIS

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'HETRAZAN' (1-diethylcarbamyl-4-methylpiperazine hydrogen dicitrate) is a new compound which has recently been introduced for the treatment of filariasis (Santiago-Stevenson et al. 1947). A previous note has described a study of its mode of action in cotton-rats infected with *Litomosoides carinii* (Hawking et al. 1948); apparently hetrazan acts something like an opsonin, modifying the microfilariæ so that they are seized by fixed phagocytes of the reticulo-endothelial system, which later destroy them. The present note reports the main conclusions reached during preliminary clinical investigations in Tanganyika and Uganda.

Under African conditions the dose schedule must be as simple and short as possible if it is to have any wide application. As a general rule, patients were treated with only one dose per day and treatment was not continued more than seven days.

EFFECT ON MICROFILARIA BANCROFTI

The maximum tolerated dose seemed to be about 20 mg. of the salt per kg. body-weight in one dose daily (see below). Doses as low as 1 mg. per kg. twice daily, or 0·5 mg. per kg. three times daily, removed all or most of the microfilariæ from the blood; but usually doses of 0·2 mg. per kg. twice daily did not completely clear the blood-stream. When bigger doses were given (12–20 mg. per kg. per day) the blood usually became free from microfilariæ in 3 days or less; but rarely a few microfilariæ persisted and stayed at a steady low level of about 1–6 microfilariæ per 60 c.mm. until the end of the observation period (3 months). Large single doses (e.g., 20 mg. per kg.) removed all or most of the microfilariæ from the blood in most of the patients treated; the possibility of mass treatment by such short high-dosage courses is being closely investigated.

Various features of the action of hetrazan upon *Wuchereria bancrofti* in man were compared with the similar features of its action upon *Litomosoides* in cotton-rats; and, when comparison was possible, a close similarity was found. Thus:

(1) When 12 mg. per kg. was given to patients by mouth about 8.30 P.M. (when the microfilarial tide was rising), 60–80% of the microfilariæ had disappeared from the blood at the first time of examination half an hour later. Similarly, when 50 mg. (total) of hetrazan citrate was injected intravenously, so as to cut out the time required for absorption from the alimentary canal, 60% of the microfilariæ in the blood disappeared within 4 minutes.

(2) Microfilariæ of *W. bancrofti* were set up in vitro at 37°C in a medium consisting of serum and Ringer glucose. They lived for several days in contact with hetrazan citrate 200 mg. per 100 ml. or with serum from a patient who had received hetrazan one hour previously. Similar results were obtained with the microfilariæ of *Onchocerca*.

These observations agree with our previous findings about the microfilariæ of *Litomosoides* and show that hetrazan does not have a direct toxic action o microfilariæ nor is it changed by the body into some which does have such an action.

(3) Five patients, who had hydroceles containing r filariæ, were treated with hetrazan, usually at 20 mg. p daily for a week. At the end of this time their night b were free from microfilariæ. Samples of hydrocele fluid taken again and in all cases microfilariæ were still p Hetrazan citrate (about 40 mg. per estimated 100 n hydrocele fluid) was injected into the hydroceles. The day microfilariæ were still present.

These observations support the hypothesis hetrazan acts by sensitising the microfilariæ for ph cytosis by the reticulo-endothelial system, to w microfilariæ in the blood-stream are exposed. however, the microfilariæ are not in contact with phagocytes because they are in a serous cavity, su the hydrocele of a man or the pleura of a cotton they are apparently not destroyed by hetrazan.

EFFECT ON ONCHOCERCA VOLVULUS

(a) *Microfilariæ.*—Owing to allergic reactions dose of hetrazan employed against onchocerciasis much smaller than that used against filariasis, espec in the first 3 days. A common dosage was 50–100 per patient, twice daily, for the first 2 days and t 150–600 mg. twice daily. Under this dosage the s sometimes became negative for microfilariæ after days, but sometimes microfilariæ persisted for m than 10 days in spite of continued treatment. A patients were followed up for 2–3 weeks after tr ment, and some of these relapsed during this per Apparently hetrazan has a marked action on *Mf. volv* but this is less rapid and less permanent than the ac on *Mf. bancrofti*.

(b) *Adult Worms.*—Seven patients were treated 13–27 days with courses of hetrazan at a level of 5–12 per kg. per day, after which nodules were excised examined. In all cases numerous active microfila were still present (indicating the presence of heal adult female worms). Activity of the adult female wo is always difficult to demonstrate even in nodules fr untreated patients; but in three of the above trea cases movement of female worms was seen. In all two cases, active male adults were seen. It is conclu that hetrazan fails to kill many of the adult worms *Onchocerca*.

EFFECT ON PATIENTS

Most of the patients with *W. bancrofti* were treat with hetrazan hydrochloride. This seemed to be bet tolerated (in terms of hetrazan base) than hetraz hydrogen citrate which has since become the standa preparation. In patients with *W. bancrofti* large do of hetrazan hydrochloride (20 mg. per kg. and ov sometimes caused nausea and vomiting, with or witho epigastric pain, especially if given on an empty stomac Occasionally patients complained of tender spots in th groin or scrotum. Otherwise there were no sympton which distressed the patient sufficiently to excite comme or complaint. (The investigation of minor symptoms Africans is often difficult.) This maximum tolerated do of 20 mg. per kg. *once or twice* daily is much higher tha the dose used by previous workers—namely, 2 mg. pe kg. three times daily.

In patients with *Onchocerca*, however, the first dos —even a single dose of 50 mg. hetrazan citrate almost always produced a violent reaction which wa well marked in 16 hours. There was usually swelling œdema and tenderness of the skin, especially of th buttocks and thighs. Sometimes the prepuce, penis, an scrotum were swollen. Intense itching was alwa widespread. Sometimes there was a thick papular ra over the trunk and limbs. The lymph-glands we generally enlarged and tender, especially those of femoral and inguinal groups. There was always pyrexia, ometimes up to 101–102°F. Other symptoms included oreness of the eyes and general aching. These symptoms ubsided after a few days and the patients could then olerate much higher doses—e.g., 12 mg. per kg. daily. The severity of the reaction seemed to be proportionate o the number of microfilariæ initially present in the skin ather than to the level of hetrazan dosage. Apparently he reaction is mostly an allergic one, excited by he breakdown products of microfilariæ injured or estroyed by the drug. This allergic reaction would make hetrazan unpopular if it were used for the mass reatment of onchocerciasis, although it might be quite acceptable if employed for the mass treatment of ilariasis due to *W. bancrofti*. In one patient who had dimness of vision before he was treated for onchocerciasis, he vision deteriorated further during treatment and administration of hetrazan was discontinued.

Much histological material was collected from the patients with onchocerciasis. Full publication will be delayed until this has been cut and examined.

SUMMARY

Hetrazan is very rapid and effective in removing microfilariæ from the blood of patients infected with *Wuchereria bancrofti*. It does not remove microfilariæ from hydroceles and it has no direct toxic action on microfilariæ in vitro. The clinical observations are compatible with the hypothesis that hetrazan acts by modifying the microfilariæ so that they are seized by phagocytes.

Hetrazan removes microfilariæ from the skin in patients with onchocerciasis but apparently it does not kill the adult worms. It is well tolerated by patients with *W. bancrofti* but it provokes violent allergic reactions in patients with onchocerciasis.

Grateful acknowledgments are due to the Directors, and many members, of the Medical Services of Tanganyika and Uganda, without whose kind support this work would not have been possible; and to Mr. D. Garlick for technical assistance.

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LOIASIS TREATED WITH HETRAZAN (BANOCIDE)

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This paper records observations at the Hospital for Tropical Diseases, London, on seventeen European patients (eight males and nine females) with loiasis treated with 1-diethylcarbamyl-4-methylpiperazine, the filaricidal drug marketed as 'Hetrazan' (Cyanamid Products Ltd.) and 'Banocide' (Burroughs Wellcome & Co.).

The lengths of residence of the patients in endemic areas of *Loa loa* infection ranged from 1 to 24 years, and the times between last leaving an infected area and coming under the present observation ranged similarly from a few days to 6 years.

In each case, in addition to the clinical assessment, the blood was examined for microfilariæ, both with wet films and with stained thick films, at least three preparations of each being examined where no microfilaria was found; total and differential leucocyte-counts were made; and an intradermal filarial sensitivity test and a filarial complement-fixation test were also performed. These examinations were made before treatment and were repeated at intervals during treatment and subsequently.

BEFORE TREATMENT

Calabar Swellings.—Each patient was subject to calabar swellings, and had been so for periods varying from 6 months to 14 years, the average being 5 years. The frequency of the swellings varied from one every 2 or 3 days in two recently infected persons to one every 4–8 months in a patient who had been infected for 8 years; the average frequency of the swellings was one every 6 weeks.

Microfilariæ were found in only three patients; in the remainder films were repeatedly negative despite undoubted evidence of *Loa loa* infection, including in two patients the presence of worms under the conjunctivæ and in another three patients the appearance of dead worms under the skin during treatment.

Eosinophilia.—The total leucocyte-counts varied from patient to patient from 5200 to 37,000 per c.mm., with an average of 13,080 per c.mm.; the eosinophilia similarly varied from 2 to 59%, with an average of 23%.

Immunology.—A standardised intradermal filarial sensitivity test[1] was positive in each patient, and sera of nine of the seventeen patients gave positive complement-fixation reactions with filarial antigen.

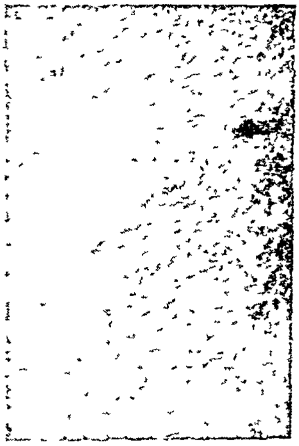

Fig. 1—Dead adult *Loa loa* under skin after treatment.

Diagnostic Criteria.—A diagnosis of loiasis was accepted if microfilariæ of *L. loa* were found or an adult *L. loa* was seen. Failing either of these criteria the diagnosis was accepted if *all* the following conditions were satisfied: (1) the recent history or presence of calabar swellings was beyond doubt; (2) there was an otherwise unexplained eosinophilia of more than 10%; and (3) there was immunological evidence of filarial infection shown by intradermal or complement-fixation tests.

TREATMENT

Dosage.—Owing to limited supplies, each of the first six patients was treated with daily doses of only 2 mg. per kg. of body-weight, but later the daily dose was increased to 4 mg. per kg. in two cases, and then to 6 mg. per kg. for each of the remaining nine patients. The daily dose was divided into three equal portions given by mouth after breakfast, luncheon, and supper. Two patients were treated for 10 days, eight for 14 days, and the remaining seven for 21 days; the total amounts given varied from 1·2 to 10·5 g.

General.—The patients were normally kept in hospital until at least the first week of treatment had been completed, after which, provided they had no toxic symptoms and felt otherwise well, they were treated as outpatients. They were requested to attend the outpatient department at monthly or two-monthly intervals after treatment; in this way one patient has been under observation for 14 months after finishing treatment, one for 12 months, one for 8 months, one for 6 months, two for 3 months, and six for 2 months or less. Questionaries

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[1] Fairley, N. H. *Trans. R. Soc. trop Med. Hyg.* 1931, 24, 635.

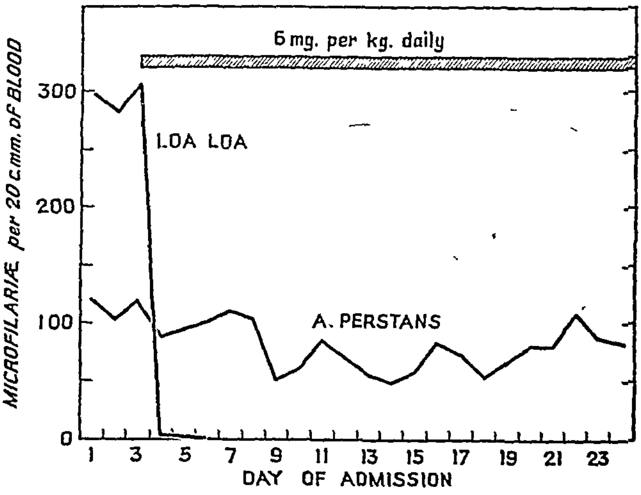

Fig. 2—Disappearance of microfilariæ of *Loa loa* from blood and insensitivity of those of *Acanthocheilonema perstans* under treatment in a patient with a double infection.

were also sent to five patients who went abroad soon after treatment.

IMMEDIATE EFFECTS

Cutaneous Reactions.—On the day after the start of treatment six patients complained of itching, and in three of them the pruritus was accompanied by rashes. In one the rash was morbilliform and diffusely distributed over the trunk, in another it was urticarial and affected only the left arm, and in the third it was papulo-erythematous and affected only the neck and upper chest; the rashes were transitory and lasted only 48 hours. The irritation was more protracted, taking usually 3 or 4 days to disappear, though in one case it lasted 16 days; its intensity seemed less than that of the itching and burning experienced by some patients with onchocerciasis treated with the same drug, and it was alleviated by 'Benadryl' 50 mg. or 'Anthisan' 100 mg. thrice daily. In three patients, one of whom had no other cutaneous reactions to treatment, cutaneous thickenings or nodules appeared; these were about 0·5 cm. in diameter and disappeared in 2 or 3 days. In three further patients cutaneous serpiginous linear swellings appeared, in one patient within 24 hours and in the other two between the 3rd and 4th days from the start of treatment. The appearance, size, and shape of the swellings suggested reactions round adult worms (fig. 1), and in two patients specimens of dead adult *L. loa* were extracted from the swellings; Prof. J. C. Buckley kindly confirmed their identity. Five of the seventeen patients showed no cutaneous reactions during treatment.

Effect on Microfilariæ.—The embryos of *L. loa* rapidly disappeared from the peripheral blood of treated patients. One patient showed a few microfilariæ on the day after the start of treatment but none on the third day, whereas before treatment the average number present at the corresponding time of day was about 300 per 20 c.mm of blood. This patient also had embryos of *Acanthocheilonema perstans* in his blood, and the relative insensitivity of this microfilaria to the drug was clearly demonstrated (fig. 2).

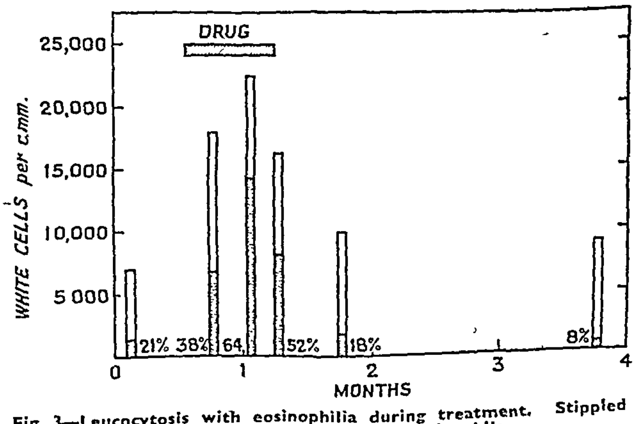

Fig. 3—Leucocytosis with eosinophilia during treatment. Stippled portions of columns represent eosinophils.

Leucocytes.—Many patients showed during treatment a rise in their total leucocyte-count, associated with an increase in the eosinophil percentage (fig. 3).

Temperature.—During treatment three patients showed trivial spikes of temperature. A more interesting effect on temperature was observed in four patients who before treatment were having slight pyrexias accompanied by calabar swellings or visible migrations of worms. Fever is not usually recorded in classical descriptions of loiasis, and it is not clear whether the fever in these patients was accidental or whether the careful observation to which they were being subjected revealed a hitherto unemphasised feature of loiasis. The interesting fact is that in each of the four patients the fever disappeared within 36 hours of the start of treatment (fig. 4).

Nausea without vomiting was encountered in four patients, and lasted 3–5 days after the start of treatment.

Headache.—During treatment four patients complained of headache, which though generally mild tended to persist, lasting from 4 days in one case to the whole duration of the treatment in another.

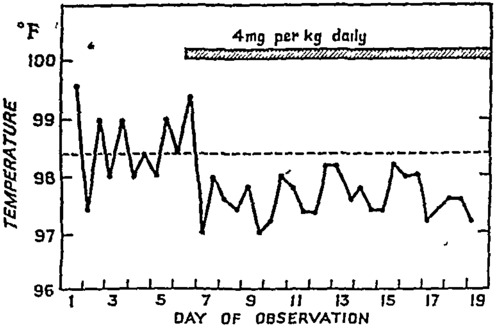

Fig. 4—Fever in an untreated patient and its disappearance und treatment.

LATER EFFECTS

Clinical.—With one exception all the treated patient have remained entirely free from symptoms, and nin have been followed up for 6 or more months after treatment. The one exception had a recurrence of calaba swellings, but this was 3 months after re-entering a endemic area of the disease, so it is possible tha reinfection had occurred. These results are in general agreement with, but seem somewhat better than, thos obtained by Stefanopoulo and Schneider.[2] In most o their patients symptoms, particularly pruritus, recurre though with diminished intensity after an intermissio of only about three weeks following a single course o treatment; to achieve lasting benefit they found i necessary to give 2–4 courses of treatment. Each o their courses lasted only 7–10 days, and it is possible that longer courses have some advantage.

Immunology.—In eight patients the intradermal filarial sensitivity test was repeated 3–5 months after the treatment; the reaction was still positive, as might be expected from its nature. On the other hand, the disappearance of circulating filarial antibody has been demonstrated in several patients. Three months after treatment, five of the nine patients whose sera before treatment gave positive complement-fixation reactions with filarial antigen were retested. In four the reaction had changed from a strong positive to a negative, while in the fifth, though the reaction remained positive, the amount of complement fixed had decreased from 8 to 5 M.H.D. In another patient, re-tested only 2 months after treatment, the reaction had also changed from a strong positive to a weak positive.

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[2] Stefanopoulo, G. J., Schneider, J. *C.R. Soc. Biol. Paris*, 1948, 142, 930.

COMMENT

Neither symptoms nor alterations in total and differential leucocyte-counts were found in two healthy persons to whom the drug was given in doses of 6 mg. per kg. of body-weight daily for 14 days. It seems likely that the reactions in patients with loiasis given the drug are due to the death of the parasites, since embryos disappear from the blood, cutaneous lesions containing dead adult worms are found, calabar swellings and other manifestations of the disease cease, and circulating filarial antibody disappears.

SUMMARY

In loiasis, 1 - diethylcarbamyl - 4 - methylpiperazine brought about disappearance of microfilariæ from the blood and death of adult worms. Cutaneous reactions, headache, nausea, transient fever, and leucocytosis with eosinophilia occurred at times during treatment. In some patients mild fever present before treatment (possibly a hitherto overlooked feature of loiasis) disappeared on treatment.

All the patients except one have remained free from symptoms of loiasis for 1–14 months since treatment; the exception may have been reinfected. Complement-fixation tests showed disappearance of circulating filarial antibody from treated patients.

The findings suggest that the drug is a valuable filaricidal agent in loiasis.

Our thanks are due to the Medical Research Council, Lederle Laboratories Division American Cyanamid Company, and Burroughs Wellcome & Co. for supplies; and to the Wellcome Museum of Medical Science for the photograph.

SEQUELÆ OF MENINGOCOCCAL MENINGITIS IN CHILDREN

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THOUGH it is widely recognised that chemotherapy has greatly reduced the mortality from meningococcal meningitis in children, it is not so clear from published reports whether or not there is a heavy incidence of sequelæ among the survivors. The fact that some of what may be termed borderline patients who might have died but for modern therapy now survive made it possible that serious sequelæ might even have increased. This study was made to investigate this point.

Between October, 1938, and May, 1948, 50 children with meningococcal meningitis were admitted to the Hospital for Sick Children; 43 were aged 2 years or less, and 29 of these were aged a year or less. There was only 1 child over the age of 5 years. They were all treated with one of the sulphonamides, with or without the addition of antimeningococcal serum or penicillin. The following is the result of an attempted follow-up of these children.

Of the 50 children, 7 (14%) died in hospital of the meningitis; 1 died eleven months later in the Radcliffe Infirmary, Oxford, with pneumonia and bilateral mastoiditis following whooping-cough. At necropsy the only stigmata of the meningitis eleven months before were slight thickening of the arachnoid in the interpeduncular fossa, adhesions and thickening round the base of the brain, and some thickening of the spinal-cord arachnoid.

Of the remaining 42 children, 35 were seen and examined personally; 3 were followed up by letter and a doctor's report obtained where the child was not normal; and 4 could not be traced; but all of them had been seen at various periods after discharge and found to be normal:

Total		*Died*		*Seen*		*Traced*		*Not traced*
50	..	7	..	35	..	4	..	4

PROGNOSIS

The prognosis was worst in the youngest age-group. Thus, of the 29 infants aged a year or less, 6 (21%) died. Of the 14 children aged more than a year and less than 2 years, only 1 (7%) died. There were no deaths among the children aged more than 2 years. The details according to age-group were as follows:

Age (yr.)	*Number*	*Alive*	*Dead*
0–1	29	23 (*79%*)	6 (*21%*)
1–2	14	13 (*93%*)	1 (*7%*)
Over 2	7	7 (*100%*)	0
Over 5	1	1 (*100%*)	0
Total	*50*	43 (*86%*)	7 (*14%*)

It is interesting to compare these figures with those of other groups treated in different ways, including those receiving no specific therapy and those receiving serum alone.

Batten (1915), while on the staff of the hospital at which these patients were treated, found that among infants and young children not given specific therapy the case-mortality was 50%. Slesinger (1933) found a case-mortality of 40% in children under the age of 5 years and treated with serum alone. The introduction of sulphonamide therapy has led to a still lower mortality. Beeson and Westerman (1943) found a mortality of 24% for the same age-group. In the present series, in the children under the age of 5 years there was a case-mortality of 14%. The better figures in the present series may be due to the fact that latterly, in the treatment of the more seriously ill children, early use has been made of intrathecal crystalline penicillin, which has been given at the same time as the systemic administration of one of the sulphonamides. It is interesting to find that in two large surveys, one by Jubb (1943) and the other by Beeson and Westerman (1943), and in a small survey by Banks (1940) the results with sulphonamides alone were better than those with combined treatment with both sulphonamides and serum. The case-mortalities with different methods of treatment were as follows:

Age-group	*Serum* *	*Sulphonamides and serum* †	*Sulphonamides* †	*Present series*
0–1	54%	33%	22%	21%
1–2	10%	13%	18%	7%
0–2	42%	25%	18%	16%
1–5	27%	16%	12%	5%

* Slesinger (1933).
† Jubb (1943).

SEQUELÆ

Of the 42 children who survived in the present series, 4 had sequelæ. In only 1 of these children were the sequelæ so severe as to necessitate admission to a special institution. This child was aged 13 months when he had meningitis. He has hydrocephalus, hemiplegia, and optic atrophy, and is mentally defective and deaf. The other 3 children have deafness as their only disability, 2 of them being almost completely deaf in both ears while the third had bilateral otitis media at the same time as the meningitis and now has impaired hearing in the right ear. Their ages when they had the meningitis were 16 months, 10 months, and 13 months.

Of the 5 children who developed squint during their illness, 3 now have no squint. One has a squint with full range of movements of each eye, and the squint is probably due to the presence of myopia of moderate degree. The other one has a slight inconstant squint; her present age is 16 months and, since she has full range of movements in each eye, it is considered that the squint is probably not the result of the meningitis.

Another child has a pronounced horizontal nystagmus, not noticed before she had meningitis. Examination of the rest of the nervous system reveals no abnormality. She has been seen by the ophthalmic surgeon, who considers that the nystagmus is not causing any disability, is not of ocular origin, and, in view of the family history of nystagmus, is probably familial.

The intervals between the meningitis and the subsequent examinations were as follows:

Interval (yr.)	10	9	8	7	6	5	4	3	2	1	Under 1
No. of cases	2	3	7	1	4	2	0	5	6	5	3

The possibility of late development of sequelæ, such as mental defect or deafness, can be safely excluded in all but the 3 of this series whose examination took place within a year of the original infection. The low incidence of sequelæ with modern treatment compared with that when no specific therapy was available is most noticeable, especially in the infants and younger children. For example, Batten (1915) found that, when no specific treatment was given, 35% of all the cases—i.e., more than half of those surviving—showed sequelæ. The incidence of permanent sequelæ in those receiving serum alone was found by Slesinger (1933) to be 27%. In those treated with sulphonamides the incidence of sequelæ has been much lower. Maddock (1943) found 19% permanent sequelæ. The incidence in this series was 8%.

The commonest permanent complications in this young age-group were said to be blindness, deafness, and mental defect. The incidence of deafness in a large series of cases reviewed by Flexner (1913) was 13% in children receiving no specific therapy and 3·5% in those receiving serum treatment. Slesinger (1933) found the incidence of deafness in those treated with serum alone to be 9%. In the children treated with sulphonamides and reviewed by Jubb (1943) deafness was found in 4%, and in the group surveyed by Degen (1945) deafness was found in 6%. The incidence of deafness in the present series was 8%. Thus it appears that, though specific therapy greatly reduces the incidence of deafness as a complication, deafness is almost equally common in cases treated with serum and with sulphonamides.

In the youngest age-group blindness is said to be the commonest complication, and in the older deafness is more common. That was not found in the present series, where there were 3 children with deafness and only 1 with blindness (the child with deafness, hydrocephalus, hemiplegia, and optic atrophy). The other striking finding in the present series was the low incidence of mental deficiency—only 1 case. There is still a possibility, however, that the last 3 children—those who have been followed up for less than a year—could be backward, though hitherto (they have all been examined at least six months after the meningitis) there are no signs of retardation.

SUMMARY

The present survey shows that (as is already well recognised) adequate chemotherapy greatly reduces the case-mortality in the very young as well as in the older age-groups. What is equally important is that the incidence of serious sequelæ in this age-group was very small. This means that modern treatment of meningococcal meningitis is not just saving life to leave, as a tax on the community and a reflection on modern medicine, a host of defective children.

Thanks are due to members of the medical staff of the Hospital for Sick Children for permission to investigate children under their care.

References at foot of next column

ISOLATION OF THE KARP STRAIN OF RICKETTSIA TSUTSUGAMUSHI

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H. E. BROWN

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THE Karp strain of *Rickettsia tsutsugamushi* has been used extensively in experimental work on scrub-typhus (Topping 1945, Fulton and Joyner 1945, Bengtson 1945, 1946, McLimans and Grant 1947, Peterson and Fox 1947, Tullis et al. 1947, Rights and Smadel 1948, &c.), probably because it was the first of those isolated during the 1939–45 war to become generally available for study. Since there have been several conflicting accounts of its origin, it seems advisable to record the circumstances of its isolation (the brief account given by Rights and Smadel (1948) is correct).

An American soldier (Karp) was wounded in the Buna-Gona area of New Guinea, evacuated to Brisbane, and admitted there to the 42nd U.S. Hospital. Soon afterwards he became febrile. On Jan. 15, 1943, a sample of his blood was received in the Laboratory of Microbiology and Pathology of the Queensland Health Department through the courtesy of Major W. C. Merkel. About 1·5 ml. of clot was inoculated intraperitoneally into a guineapig weighing 250 g., and the serum was used for agglutination tests with various organisms. The results of the test with *Proteus* OXK on this and later sera were as follows:

Date		*1 : 20*	*1 : 40*	*1 : 80*	*1 : 160*	*1 : 320*
Jan. 15, 1943	..	–	–	–	–	–
Jan. 30, 1943	..	+++	+++	+++		
Feb. 22, 1943	..	+++	+++	++	+	–

The results with other test organisms were not significant.

Karp recovered from his illness.

The temperature of the inoculated guineapig rose after an incubation period of 10 days, and reached 105·5°F. The guineapig was killed on the third day of fever, and from it other guineapigs were inoculated. The strain was maintained in guineapigs (mostly weighing 200–350 g.), usually by intraperitoneal inoculation of liver-spleen-kidney emulsion, and in this work we had the valued assistance of J. S. Wannan. After thirty-five passages the strain was voluntarily discontinued. The 14 guineapigs of the first nine passages which were not killed for examination and passage all survived the infection. After an incubation period of 5–10 days (average 7·5 days) they underwent a fever lasting 2–8 days (average 5·5 days) with an average maximal temperature of 105·1°F. After nine passages the strain apparently became more adapted to guineapigs, and thereafter the average mortality was about 50%.

Guineapigs killed after several days' fever had a greatly enlarged spleen and rather viscous fluid in the peritoneal cavity. Often there was a fibrinous deposit on the surface of the spleen. Rickettsiæ were usually present in the peritoneal fluid and abundant in the deposit on the spleen. In those guineapigs which died as a result of the infection (the 14th–16th day after inoculation being the most likely period) the pleural cavities were found filled with clear and rather viscous fluid.

The presence of pleural fluid could often be suspected during life by the development of respiratory distress. This symptom commonly appeared about the 14th day and could often be relieved by aspirating the fluid. As much as 17 ml. was removed on the 18th day after inoculation from the left pleural cavity of a guineapig weighing 340 g.; the guineapig's temperature had by then returned to normal for 5 days, and the animal survived the illness. From another guineapig inoculated at the same time and 6 days convalescent, 9·5 ml. of pleural fluid was aspirated, and 4 ml. of this was injected intraperitoneally into each of a pair of guineapigs; these showed no sign of infection.

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On three occasions the strain was inoculated into mice and maintained in them for a few passages. Inoculated mice usually died in 6–10 days. Rickettsiæ could be demonstrated readily in the peritoneal fluid after the first passage.

In March, 1943, the strain was sent to Dr. F. M. Burnet, F.R.S., of the Walter and Eliza Hall Institute, Melbourne, after undergoing two passages in guineapigs and three in mice. In July, 1943, material from the nineteenth guineapig passage was given to Commander I. L. V. Norman, U.S.N., for transmission to America. This material apparently met with some misadventure, probably from exhaustion of dry ice during transit, and in the following month a further Karp sample was obtained by Commander Norman from Dr. Burnet. Its arrival at the U.S. Naval Medical Research Institute and subsequent study there are recorded by McLimans et al. (1944). Dissemination of the strain to other laboratories followed, and in this process an active agent was Dr. R. Lewthwaite, who early in 1944 (to use his own words) "scattered typhus strains like confetti at a wedding in America, Britain, and India." His chief "confetti" were the Raub and Seerangayee strains isolated in Malaya in 1932 (Lewthwaite and Savoor 1936) and maintained since, often under considerable difficulties.

A feature of the Karp strain is that it was pathogenic for guineapigs from the first inoculation with human blood. Only a minority of strains of *R. tsutsugamushi* are obviously pathogenic for guineapigs. Lewthwaite and Savoor, for instance, experienced many failures before they established the Seerangayee strain in guineapigs. In this respect the Karp strain may be contrasted with two other strains studied by us in Brisbane in 1940 in conjunction with D. W. Johnson, D. J. W. Smith, and C. L. Greaves but not reported. These strains were isolated by the inoculation of mice with blood obtained from patients with scrub-typhus at Innisfail, North Queensland, by courtesy of Drs. T. J. P. Cotter and R. Hertzberg. The strains were readily maintained in mice for 17 and 13 passages, usually killing the mice in 7–10 days, but attempts to establish them in guineapigs were unsuccessful.

A sequel of the wide use of the Karp strain has been a distressing toll of laboratory infections with it. In Melbourne, this agent was responsible for one tragic death (Burnet 1943). In England there were four laboratory infections during the development of a vaccine intended for use on the Burma front (van den Ende et al. 1946, Fulton 1949), and there were several cases also in America (Bengtson 1945). The Karp strain was probably responsible also for some of the other laboratory infections in which the infecting strain was not specifically mentioned.

SUMMARY

The Karp strain of *Rickettsia tsutsugamushi* was isolated in Brisbane in January, 1943, from an American soldier infected in New Guinea.

Notable features of this strain are its pathogenicity for guineapigs, its extensive use in experimental studies of scrub-typhus, and the number of laboratory infections caused by it.

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A NEW CONTRAST MEDIUM FOR HYSTEROSALPINGOGRAPHY

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ALTHOUGH iodised oil has been largely used for hysterosalpingography for many years with satisfactory results, some uneasiness has developed about the risk of undesirable sequelæ, particularly because it may produce tissue irritation with serious consequences in the tubes, and also oil embolism, which has proved fatal. To avoid these risks Rubin in 1941 introduced 'Visco-rayopake,' which is a water-miscible substance, and recently Sharman[1] has reported on his findings with a similar contrast medium, 'Rayopake.' Neither substance is generally obtainable in this country.

For over a year I have been using a new British contrast medium, 'Viskiosol Six,' which has recently been placed on the market. This contains 50% of diodone in water with 6% of polyvinyl alcohol added to give sufficient viscosity. It is non-irritant and the diodone is rapidly absorbed. Being water-soluble there is no risk of producing oil embolism. No complications have so far arisen with it. Pregnancy is known to have followed its use in at least two patients, and one of these has been safely delivered at term and the other is already beyond the seventh month.

It is usually convenient to take films after the injection of 3, 6, and 9 ml. A cannula of the Provis type has been used, because I do not think it justifiable to injure the cervix with the screw type often recommended. It is essential, however, to keep up firm pressure with the cannula against the cervix with counter-pressure from a volsellum, to prevent the leakage which occurs easily owing to the low viscosity of the solution. A final

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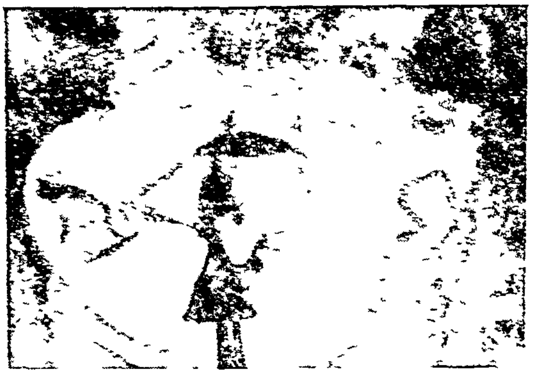
[1] Sharman, A. *J. Obstet. Gynæc.* 1948, 55, 770.

Fig. 1.



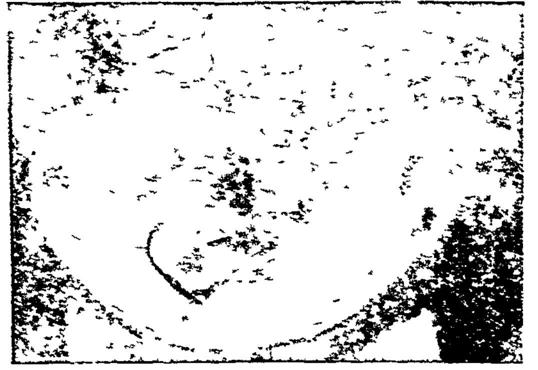


Fig. 2.

film may be taken 5 or 10 minutes after the injection has been finished, to demonstrate the presence of the medium in the pelvic cavity. After this time the shadows become increasingly difficult to recognise in films owing to the rapid absorption of the diodone. Since it is unnecessary to take a further film in 24 hours the use of this new substance offers an added advantage, especially in outpatients.

The shadows of the uterus and tubes are not quite so dense as with iodised oil, and the latter is preferable if it is desired to show deformities of the uterus or filling defects. The appearance of the medium as it passes in a stream laterally from the tubes into the peritoneal cavity also differs from that of the characteristic fall of the globules of iodised oil. Fig. 1 shows the appearances after the injection of 6 ml., and fig. 2 the appearances 5 minutes later.

I am indebted to Messrs. May & Baker Ltd. for supplies of this contrast medium for trial.

COMPLETE HEART-BLOCK ASSOCIATED WITH AMŒBIC HEPATITIS

NORMAL RHYTHM RESTORED WITH EMETINE *

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Heart-block associated with amœbiasis is a rarity. In the literature of the last twenty years we have found only three references; and in the three reported cases of auriculoventricular dissociation this complication occurred during the dysenteric phase of the infection. In the course of long-continued diarrhœa other factors may influence the cardiogram; among these should be mentioned anæmia, toxæmia, malnutrition (including thiamine and nicotinic-acid deficiency), peripheral circulatory failure, uræmia, and abnormal blood and tissue chemistry.

Petzetakis (1925) studied polygraphically a European aged 40 who lived in Egypt and had acute amœbic dysentery. Jugular phlebograms showed auriculoventricular dissociation: auricular rate 55–65 per min., ventricular rate 45–50. After four injections of emetine, ventricular extrasystoles appeared, and three days after the ninth injection sinus rhythm was re-established.

Gerbasi (1931) gave very brief cardiac findings in 26 children (mostly wasted infants) with amœbic dysentery. One fatal case, in a child aged 5, showed at times complete and incomplete heart-block (cardiogram not reproduced) and later auricular fibrillation. There were also infants showing prolonged P–R interval (0·18 sec.) and 3 cases of sino-auricular block; also one case of alleged auricular flutter (cardiogram unconvincing) and one with prolonged intraventricular conduction. Response to emetine was scarcely mentioned, and the impression gained is that the circulatory and cardiographic changes were due to dehydration, malnutrition, and anæmia.

Heilig and Visveswar (1943), investigating in Mysore the effects of emetine on the heart, found surprisingly that of 45 cases of amœbic dysentery 34 had abnormal cardiograms on admission. Many of these patients, however, had coexistent chronic malaria, hookworm infestation, and doubtless anæmia and malnutrition. The usual abnormalities were low-voltage or flattened T waves or depression of the S–T interval. In some of these cases improvement in the reco took place after emetine was given. The only case of hear block was in a Mohammedan girl aged 12 years. Befo she received emetine a cardiogram showed complete hear block with ventricular extrasystoles (described in the te as incomplete heart-block). After emetine gr. 6 sinus rhyth was recorded with prolonged P–R interval (0·32 sec.); b after completion of the course of emetine gr. 12, what w probably complete heart-block returned. (Cardiogram str were short and were described as 2 : 1 heart-block.) T general and circulatory condition was said to have be incomparably better after emetine.

In the case of amœbic hepatitis here reported t patient had had no diarrhœa for nine months and w well nourished. The presenting symptoms were pai due to hepatitis, and fainting episodes which proved be Stokes-Adams attacks. Both the hepatitis and t heart-block responded to emetine.

CASE-RECORD

An ex-Army officer, aged 28, was first seen by one of (M. D. R.) on Jan. 1, 1948. He complained of several attac daily of giddiness and faintness lasting one or two minute At no time did he lose consciousness. During the attack which occurred both by day and night, the heart seemed t be missing beats. For a few days he had had lower stern discomfort and pains in the shoulders which increased o breathing. Slight effort dyspnœa had been noticed for year. There was no history of acute rheumatism or diphtheri but he had had scarlet fever at the age of 19, and since the occasional pains in his limbs. In 1942, while serving in th Western Desert, he had had mild jaundice and in the sam year periodic attacks of diarrhœa for which he did not repo sick or receive treatment. Diarrhœa had recurred intermittently, the last occasion being in May, 1947.

He was a well-nourished muscular man. The resting pulse-rate was 40 and regular and rose to 60 after short strenuous exercise. Blood-pressure 145/70 mm. Hg. Heart not enlarged; no murmurs. Liver dullness extended upwards in the mid-axillary line to the fourth interspace. The liver edge could not be felt. A diagnosis of heart-block was made.

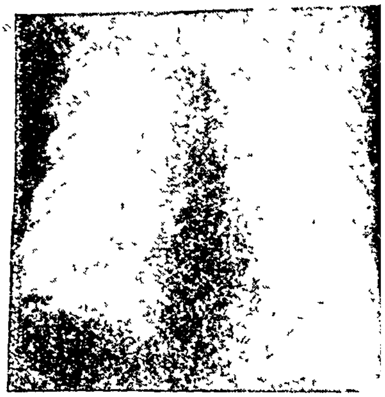

Fig. 2—Postero-anterior radiogram of ches (Jan. 5, 1948) showing right dome of dia phragm raised, with blurred outline mottling at base of right lung; transverse diameter of heart increased to left and right; and prominent pulmonary arc.

During the next three days Stokes-Adams attacks occurred frequently with periods of asystole lasting three to four seconds. He would then feel faint and become pale and sweaty. On Jan. 5, 1948, a cardiogram (fig. 1) showed complete heart-block: auricular rate 88, ventricular rate 31 per min., ventricular rhythm slightly irregular.

X-ray examination (fig. 2) showed that the right dome of the diaphragm was considerably raised; it was immobile, and its outline was blurred. There was also mottling at the base of the right lung, extending up to the right root region. The transverse diameter of the heart was increased to the left and right; the left auricle was not enlarged. The appearances were typical of amœbic hepatitis with inflammatory changes spreading through the diaphragm into the lung above.

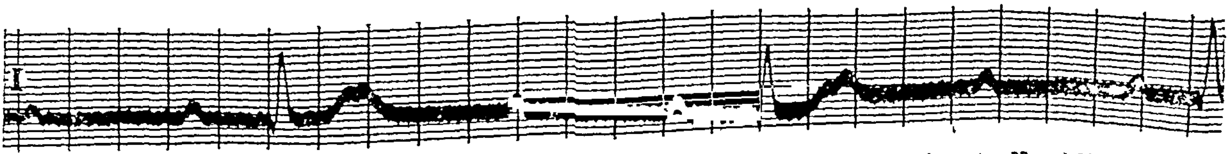

Fig. 1—Electrocardiogram (Jan. 5, 1948), lead I, showing complete heart-block; auricular and ventricular rates 88 and 31 per min.; and ventricular rhythm slightly irregular.

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* Paper read before the British Cardiac Society May 13, 1948.

Six consecutive stool examinations were negative for *Entamœba histolytica* and sigmoidoscopy showed normal appearances. The white blood-cells numbered 8000 per c.mm.

He was put to bed and daily intramuscular injections of emetine hydrochloride gr. 1 were begun on Jan. 5. After the third injection the lower chest pain disappeared and the pulse-rate increased to 80; it was then quite regular. but next day extrasystoles appeared at every second to fourth beat. The course of emetine (gr. 11) was completed on Jan. 17 and on Jan. 23 a cardiogram (fig. 4) showed restoration of normal rhythm: rate 40 with P–R interval 0·2 sec. Radiography now showed free movement of the diaphragm; the right dome had returned to its normal level and was of regular outline (fig. 3). The heart was more vertical and its size and contour normal.

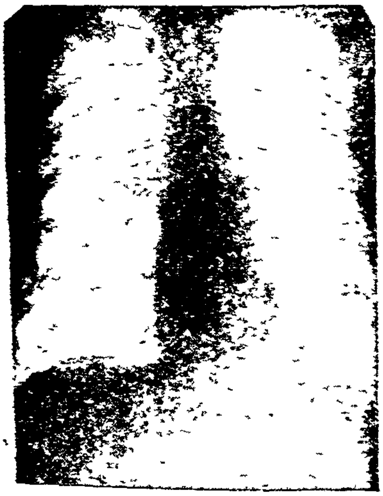

Fig. 3—Postero-anterior radiogram of chest (Jan. 23, 1948) showing right dome of diaphragm now normal in position and regular in outline; size and contour of heart normal; and pulmonary arc still a little prominent.

At this time the patient complained of pains in the jaws, shoulders, and buttocks. The erythrocyte-sedimentation rate was 4 mm. in the first hour (Westergren). The pains gradually subsided during the next four weeks.

A cardiogram on Feb. 2 again showed sinus bradycardia: rate 45. The P–R interval had lengthened to 0·24 sec. but P, R, and T in all the limb leads were of higher voltage. Lead III showed two sino-auricular nodal extrasystoles followed by ventricular escape. By Feb. 23 the pulse had accelerated and a cardiogram (fig. 5) showed normal rhythm, rate 70, with P–R interval 0·2 sec., and no extrasystoles. 'Diodoquin' (di-iodohydroxyquinoline) gr. 3¼ thrice daily was then given for a month. He was apyrexial throughout the illness.

COMMENT

Though final proof of the amœbic origin of the hepatitis was not obtained, the history of recurrent diarrhœa since serving in North Africa, and the rapid response to emetine, left little doubt. The heart-block also disappeared after emetine gr. 3 and the Stokes-Adams attacks ceased shortly after the start of therapy. The decrease in the size of the cardiac shadow during treatment could be attributed to descent of the diaphragm and the restoration of normal cardiac rhythm and rate.

There was no evidence of valvular disease of the heart, but a rheumatic lesion involving the conducting tissues had to be considered in view of the jaw and limb pains which developed during treatment. At that stage, however, the erythrocyte-sedimentation rate was normal, and it seemed more probable that the pains were due to emetine intoxication; the pains disappeared a few weeks later. As to the relation of the amœbic hepatitis to the heart-block one could only speculate as to whether the cardiac lesion was an indirect toxic effect or due to blood-borne amœbic metastases; the latter seemed more likely in view of the rapid response to specific therapy. As the patient had had no diarrhœa for nine months and his nutrition was good, the effects of dehydration and malnutrition could be excluded.

Considering the proximity of the left lobe of the liver to the pericardium, it is strange how rarely the heart is affected in amœbiasis. Possibly cardiographic studies will reveal more such cases in the future.

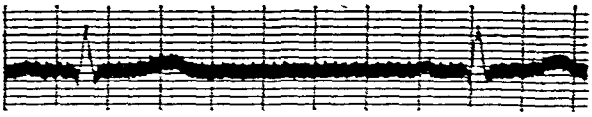

Fig. 4—Electrocardiogram (Jan. 23, 1948), lead I, showing normal rhythm re-established during emetine therapy; sinus bradycardia 40 per min.; and P-R interval 0·2 sec.

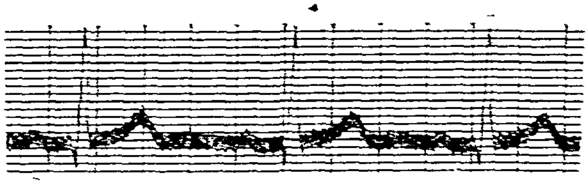

Fig. 5—Electrocardiogram (Feb. 23, 1948), lead II, showing bradycardia superseded by sinus rate of 70 per min.

Extension upwards of an abscess of the left lobe of the liver may cause inflammatory adhesion of the two layers of the pericardium, or rarely the abscess may rupture into the pericardium with rapidly fatal result (Connor 1929).

SUMMARY

A well-nourished man with amœbic hepatitis but with no recent dysentery had complete heart-block. which appeared to respond to emetine. In three previously reported cases of amœbiasis with auriculoventricular dissociation the patients had diarrhœa, thus introducing other possible factors affecting the conducting tissues.

Our thanks are due to Dr. T. Fane Tierney for the X-ray photographs.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Developments in India

At a meeting of the section of epidemiology and State medicine on July 6, Sir Allen Daley, the president, welcomed Dr. K. C. K. E. Raja, director-general of health services, government of India.

Dr. Raja surveyed recent developments in the field of health in India. He took as his starting-point the publication of the Bhore report in 1945. At the end of the war India was in a satisfactory financial position, and there were hopes that a quick start might be made with the extensive public-health programme outlined in the report. The partition of the subcontinent, however, brought with it pressing problems which soon absorbed the government's attention. A vast exchange of population with Pakistan was accompanied by much bloodshed: camps had to be opened for the refugees and displaced persons, and food, clothing, housing, and medical care provided. At one time the largest camp held no less than 300,000 inmates. All the available resources of public health were mobilised to meet these needs, and the medical services were heavily strained. The absence of epidemics during those tense months reflected the stupendous efforts that were made.

It was important, he continued, to understand the existing conditions before judging how effective the public-health programme of the new government was likely to be. In 1944 the death-rate in British India was 24·1 per 1000, and the infant-mortality rate 169, compared with 11·9 and 46 respectively in England and Wales. It was estimated that there were 100 million cases of malaria each year, and 2½ million cases of open tuberculosis with an annual mortality from this cause of half a million. There were about 1 million cases of leprosy, a quarter of which were infectious, and about 37 cases of venereal disease per 1000 of the population.

By contrast, the traditional endemic infections of India—cholera, smallpox, and plague—together accounted for only some 5% of the total deaths. The diet of the people was insufficient and unbalanced, being largely cereal. There was also a great shortage of medical personnel, as shown by the figures of 1·6 doctors and 2·4 hospital beds per 10,000 of the population, and 5000 midwives for the whole country instead of the 100,000 who were needed.

The Bhore Committee recognised that the prime needs were for vast expansion of the health services, and for a general rise in the nutritional standards of the people. They drew up a short-term and a long-term programme. The former, to be spread over ten years, provided for the establishment of a primary health-centre unit for each 40,000 of the population; each primary centre was to include a 30-bed hospital, and to afford a service of home-visiting by doctors and nurses. Twenty-five of these units would be grouped under a secondary health-centre unit, in which there would be a hospital of 200 or 500 beds with special departments. The large unit of public-health administration would be the district health organisation, catering for some 3 million of the population. The long-term programme outlined a more detailed and elaborate framework which could be built on the short-term developments. In 1946 all the provincial governments accepted in principle the Bhore Committee's public-health proposals, which were now beginning to be put into effect.

Meanwhile various government measures had an important bearing on public health. The Employees' State Insurance Act provided cash and medical benefits for sickness and injury. At its inception it covered 2,500,000 people, but it would in time be extended to cover 85% of the population. The Factories Act had been newly amended to promote the health, safety, and welfare of factory workers, and provide for medical attention inside the factories. The age at which children might be employed was raised by law from 12 to 13½ years, and adolescents were prevented from entering hazardous occupations. In addition, steps were being taken to control the drug industry. The anti-tuberculosis campaign was advancing steadily, and an extensive programme of B.C.G. vaccination had been started. The provision of rural tuberculosis centres was being considered.

Turning to the problems of medical education and research, Dr. Raja said that the Bhore Committee's three main proposals in this field had all been accepted in principle. The first of these was the establishment of an All-India Medical Institute; cost, and shortages of building materials and teachers were causing delay, but these difficulties would be overcome. The second was the improvement of selected departments of existing medical colleges. The third was the establishment of special teaching and research centres for the study of various diseases; and malaria and leprosy had been singled out as the first subjects for study at such institutes. In addition, a Council for Postgraduate Education would supervise the training of specialists.

The work of implementing various parts of the health programme had been divided between a number of special committees, some of which had already presented their reports. The upgrading committee was examining hospitals with a view to making them suitable for post-graduate teaching. The vital-statistics committee had proposed the appointment of a registrar-general for India, to be aided by provincial registrars. The first registrar-general had in fact already begun work, and it was hoped that big changes would soon be made in the system of registration in the villages. The leprosy committee had proposed the establishment of a centre at Madras for the study of this disease. The rural health committee had not yet reported. In this field Dr. Raja attached importance to the early establishment of primary health centres, which could show quick results; in some provinces these might be built around the existing anti-malaria dispensaries. Furthermore, an effective anti-malaria campaign could greatly improve the general standard of living in the locality, as had been convincingly shown in Ceylon. Another committee was concerned with the problem of the indigenous systems of medicine; the government of India took its stand firmly in support of scientific medicine, but felt that research into the traditional systems should be stimulated.

Finally, Dr. Raja emphasised that India was participating actively in the work of W.H.O., on whose agencies it had many members. Both W.H.O. and F.A.O. wer helping India a great deal, especially in the fields o malaria, tuberculosis, and children's diseases.

Sir **Bennett Hance** paid a tribute to Dr. Raja's wor as secretary of the Bhore Committee. He welcomed th proposal to establish an All-India Medical Institute which he felt could do for Indian medicine what th Johns Hopkins Institute had done for America medicine.

Sir **George McRobert** hoped that Indian postgraduates working here would not spend their time studyin for higher British qualifications, but would instead gai practical experience in such specialties as thoracic an plastic surgery; the higher degrees of Indian universitie were quite as good as ours. He asked what the government was doing about population control, which seeme to be the most urgent problem of all.

Dr. Raja agreed that fertility was continuing t outstrip mortality. At present a contraceptive programm was out of the question; there were not enough peopl qualified to give contraceptive advice and training there were religious objections, and the consequence of widely diffusing such advice might be undesirable In any event, the result would not show itself for tw generations. The problem was basically that of food-supply. There were 200,000 square miles of cultivabl land which could be used for food production when malaria was controlled. The productivity of the soil was low, but could possibly be increased threefold over th whole country. These measures would more than clos the gap in the food-supply. There were also grea possibilities of hydro-electric development. The solutio lay in improving the resources of the country, and i educating the individual in a sense of responsibility.

New Inventions

APPARATUS FOR INTERMITTENT VENOUS OCCLUSION

Over ten years have elapsed since Collens an Wilensky[1] first reported the results of intermitten venous occlusion in peripheral vascular disease. The based their theoretical considerations of the practica value of the method on the observations of Lewis an Grant,[2] who found that raising the venous pressure i a limb with a tourniquet, followed by release of th pressure, produced vasodilation of the arteries lasting from half to three-quarters of an hour. In 124 cases o peripheral vascular disease Collens and Wilensky showed that treatment by intermittent venous occlusion could relieve pain, heal ulcers, and increase walking capacity. The benefit was apparent in arteriosclerosis, including diabetic peripheral vascular disease and thrombo-angiitis obliterans. These results were confirmed in this country by Brown and Arnott.[3]

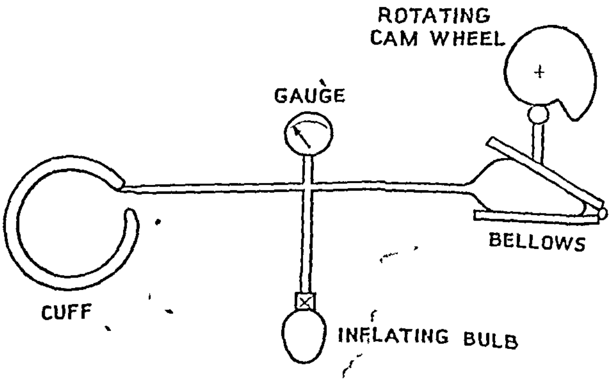

Fig. 1—Principle of apparatus.

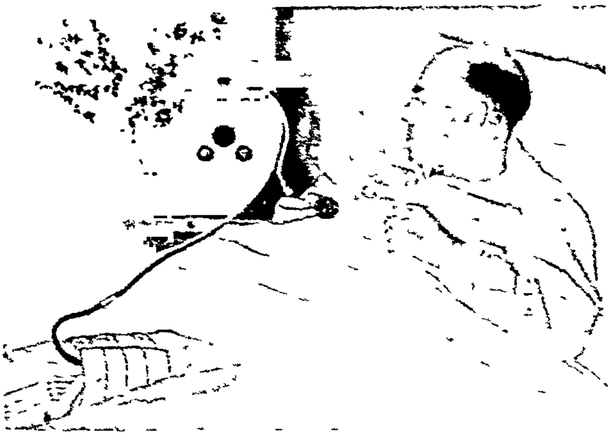

Fig. 2—Apparatus in use ; patient is setting required pressure with bulb.

Somewhat conflicting reports have been received since then about the effect produced by intermittent venous occlusion on the blood-flow through the extremities. But there is little doubt that patients with peripheral vascular disease show symptomatic improvement from this method of treatment, especially where intermittent claudication is present, and walking distances may be increased up to ten times or more.

Further clinical investigation is needed to establish the clinical indications for this form of treatment. It was originally recommended that, where ulceration, sepsis, or gangrene is present, the initial pressure should not exceed 40 mm. Hg, and the period of application an hour at a time, with rest periods of an hour. This should be increased, if the result is favourable, up to 8–10 hours a day with a pressure up to 70 mm. Hg. Where intermittent claudication was present alone, a period of intensive and continuous treatment of 200–300 hours was given, followed by an hour a day when the patient was up and about. There was a tendency to relapse when the treatment was discontinued for a few weeks.

The apparatus used for intermittent venous occlusion by Collens and Wilensky [4] was based on the principle of an air-compressor connected by cam-operated safety and release valves to the occluding cuff round the limb. Brown and Arnott [5] described three types of apparatus: the first two were similar to that designed by Collens and Wilensky, and the third was operated by water pressure. Wilson and Ogston [6] designed a simple and inexpensive apparatus, relying on hydraulic pressure from the household water mains, the intermittent action being brought about by an automatic siphon. Though these machines have given satisfactory service, a simpler and smaller design is more suitable for general home use.

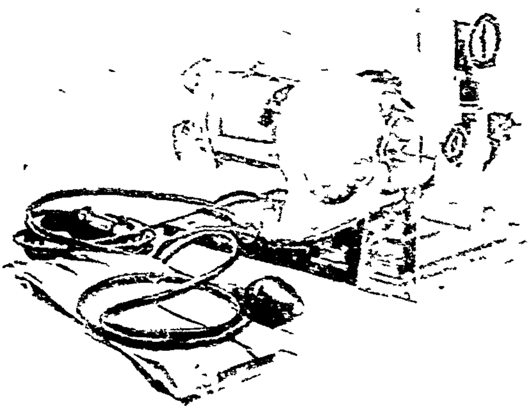

Fig. 3—Apparatus removed from case to show mechanism.

DESCRIPTION OF APPARATUS

The principle of the apparatus is extremely simple, and consists of a slowly turning cam wheel driven through a 7000 : 1 epicyclic reduction gear by a fractional horsepower fan-cooled electric motor. The cam operates a rubber bellows connected by a closed air system to the cuff round the patient's leg; included in the system are a pressure gauge and inflating bulb (fig. 1). The whole is enclosed in a metal case measuring 12½ × 7¼ × 10 inches, in the top of which is a compartment for storing cuff, bulb, and connecting wire (figs. 2 and 3). An indicator window to show when the maximum pressure has been reached, a pressure gauge, and a control switch are mounted on the front panel. On the standard machine the time cycle is fixed at 6 minutes, with 2 minutes' occlusion of the veins and 4 minutes' release (fig. 4): the pressure may be pre-set at 40–80 mm. Hg by the operator. The machine can work either one or two cuffs. Since there are no release valves or air-compressor, the apparatus is practically silent in operation, and its simplicity is such that it can be run for long periods without giving mechanical trouble.

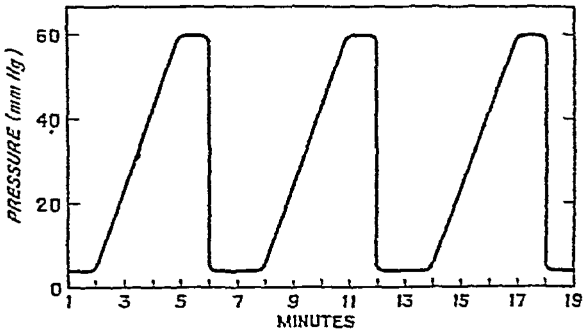

Fig. 4—Pressure curve.

INSTRUCTIONS FOR USE

(1) Plug in to the nearest electric-light point and run the machine until the indicator shows red.

(2) Switch off, and squeeze any residual air out of the bag, after having opened the valve.

(3) Apply the cuff firmly to the leg.

(4) Pump up the cuff with the bulb to the required maximal pressure, close the valve, and turn on the machine, which will continue to run automatically.

The machine will shortly be generally obtainable through Messrs. Down Bros. and Mayer & Phelps Ltd., of 32, New Cavendish Street, London, W.1, to whom I am indebted for much help and criticism.

I wish to thank Prof. Clifford Wilson, Sir Horace Evans, and Dr. William Evans for their advice and encouragement in the development of this apparatus; and also Mr. J. C. Young, of the London Hospital Medical College, and Messrs. Research Engineers Ltd., London, N.1, for their part in producing a design suitable for general distribution and arranging for its manufacture.

J. P. SHILLINGFORD
M.D. Lond., M.D. Harvard, M.R.C.P.

Bernhard Baron Institute of Pathology,
London Hospital.

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Reviews of Books

Electrocardiography and Clinical Disorders of the Heart Beat

The late Sir THOMAS LEWIS, C.B.E., M.D., D.SC., F.R.C.P., [illegible] charge of department of clinical [illegible] College Hospital. London: Shaw & Sons. 1949. Pp. 285. 25*s.*

IN this book, completed just before his death in 1945, Sir Thomas Lewis combined his two previous works *Clinical Electrocardiography* and *Clinical Disorders of the Heart Beat*, which first appeared over twenty years ago. The decision to present the two aspects of the subject in one volume is certainly justified, since with the mounting importance of cardiography the two can hardly be considered apart. It is hardly necessary to mention that Sir Thomas was a master both of his subject and of literary style; and though the present volume is very much the same as its predecessors, it still forms an excellent medium for grasping the essentials of cardiac arrhythmias, or as a preliminary to more advanced reading.

Present Conception of Rehabilitation in Tuberculosis

NORVIN C. KIEFER, M.D., medical director, Office of the Surgeon-General, U.S. Public Health Service. New York: National Tuberculosis Association. 1948. Pp. 398. $3.50.

PERUSAL of this handsomely got-up volume suggests that its editor shut himself up in a room for some months and waded through every article that had been written, between 1938 and 1947, about sanatorium and ex-sanatorium patients and their management. There are 1007 references to 670 authors, of whom 350 are quoted in the text. The text consists of quotations, direct and oblique, ripped from their contexts and loosely strung together under fifteen different chapter headings. In the 16th and last chapter the editor attempts the impossible task of straining the broth in which so many cooks have participated, and crystallising out what it is all about. On the dust-wrapper it is said that the volume is "essential to every Sanatorium Director and Tuberculosis Clinician." This is an overstatement.

Schattenseiten der Ulkuschirurgie

Prof. Dr. PAUL HUBER, Vorstand der chirurgischen Abteilung des Kaiserin-Elisabeth-Spitals, Wien. Vienna: Maudrich. 1949. Pp. 91. Sch. 36.

THIS is an account of all the mishaps that can occur after surgical intervention for ulcers of the stomach and duodenum—a unique collection of material. The way to recognise complications, the appropriate treatment, and the likely results are all clearly set out. The experience of the Viennese surgeons is very similar to that of operators elsewhere. Young surgeons will find this monograph of great value and of absorbing interest.

Obstetric Analgesia and Anesthesia

FRANKLIN F. SNYDER, M.D., associate professor of obstetrics and associate professor of anatomy, Harvard Medical School. Philadelphia and London: W. B. Saunders. 1949. Pp. 401. 32*s.* 6*d.*

THE early part of this stimulating book is devoted to respiratory injuries of the child, the second part to the treatment of pain during labour. Professor Snyder describes the physiology and pathology of respiration before birth, discussing intra-uterine pneumonia, atelectasis, and intra-uterine and extra-uterine asphyxia, and showing the part played by analgesic drugs in the production or aggravation of these states. This is a subject of considerable interest, and it is sometimes insufficiently borne in mind that the comfort of the mother, achieved by heavy doses of sedatives or deep anæsthesia, is paid for by respiratory depression in the newborn. The author maintains an acute awareness of this and other causes of respiratory difficulties, and points out that the highest peak of mortality in the entire life-span coincides with the day of birth. The results of various anæsthetic agents on mother and fœtus are set out, and laboratory methods of assessing the effects discussed. This section, well illustrated by charts, photographs, and excellent photomicrographs, includes much of Professor Snyder's original research. Methods of giving various analgesics and anæsthetics are discussed, and barbiturates, inhalation anæsthetics, rectally given analgesics, and local anæsthetics, including spinal and caudal anæsthetics, are compared; but British readers will regret that 'Trilene' is not mentioned. The inhalation anæsthetics, especially nitrous oxide, ethylene, and cyclopropane, are considered to be the best and safest for mother and child. The book is a very wide review of the subject, and will be valued alike by physiologists, pathologists, obstetricians, and anæsthetists.

Vorschlag zu einer leicht durchführbaren Krebsprophylaxe

Dr. RICHARD STOGER, emeritus assistent, der zweiten medizin ischen Universitätsklinik in Wien. Vienna: Maudrich. 1949. Pp. 64. Sch. 15.

DR. Stöger founds his argument on the hypothesis that there is an antagonism between hyperthyroidism and malignant disease. He believes that both clinical experience and animal experiment show that cancer is rare in the presence of excess of thyroid hormone. In his first section he quotes, from a wide selection of published work, the results of using hormones in the *treatment of various malignant tumours.* A second chapter describes a series of animal experiments designed to show the protective effects of thyroid hormone on animals treated with carcinogenic agents. Finally it is suggested that this theory should be applied as a prophylactic measure against cancer in human beings. Unfortunately the reader is left with the impression that the case has been rather overstated and that there is not sufficient proof of benefit to justify the use of the proposed method until it is certain that it will not do more harm than good.

Surgeon's Saga (London: Heinemann Medical Books 1949. Pp. 330. 15*s.*).—Notwithstanding a rather alarming dust-cover this book is an engaging study of one who has carefully analysed his mental problems. The book is somewhat overloaded with the incidents of Mr. Robertson McDouall's career, but his achievements and disappointments are set out straightforwardly and he allows us to watch the development of his philosophy. He reveals himself —once the vagaries of *his student days are past*—as a sensitive, broad-minded man.

Cunningham's Manual of Practical Anatomy, Vols II and III (11th ed. London: Oxford University Press. 1948. Pp. 488 and 513. 21*s.* per vol.).—These two volumes complete the set, the first of which we have reviewed *already.*[1] *Prof. J. C. Brash pays tribute in* his preface to his former teacher, and collaborator in editing "Cunningham," Dr. E. B. Jamieson, now retired. Those who have already devoured the limbs, in volume I, will hardly be content without thorax and abdomen, head, neck, and brain.

Surgery of the Hand (2nd ed. Philadelphia and London: J. B. Lippincott. 1948. Pp. 918. £5).—The first edition of Dr. Sterling Bunnell's great work must be known to most surgeons. If there are any who have not studied it, this is the opportunity to do so. Bunnell is probably best known for his work on cut tendons. The results shown in this book bring new heart to those attempting what is by some considered a hopeless task. Let it be noted that many of his excellent results were achieved a quarter of a century ago. here we truly have a pioneer. Only careful study of his methods, and considerable skill and delicacy of execution can bring like results. He also describes valuable methods of tendon transplantation, to bring new life to palsied hands. Suture of digital nerves has been neglected by many; Bunnell claims excellent results, and has even had good results with suture of main nerves, and with nerve grafting, using the "cable" graft. He also discusses plastic surgery, of which those attempting hand reconstruction need considerable knowledge. Much has been added on metacarpal injuries, on infections, and on tumours; indeed, the book has perhaps become too all-embracing, and is repetitive in places; it is certainly a massive volume. But as a book of reference on the important subject of hand reconstruction no better can be found.

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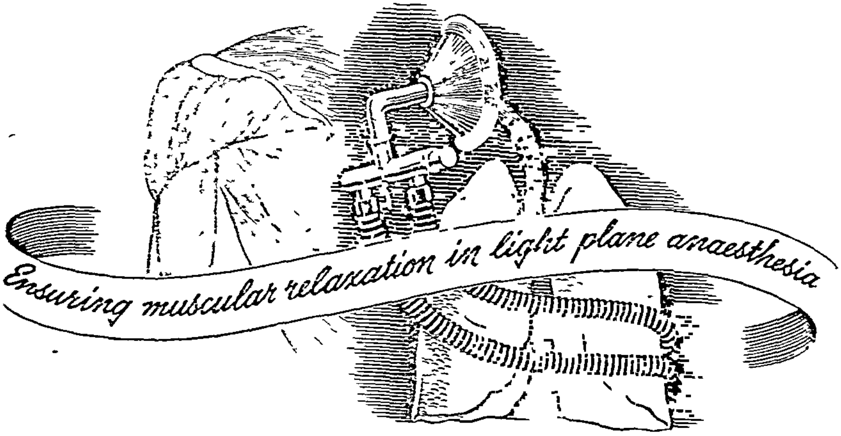
[1] [illegible] 1949, i, 528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THE LANCET

LONDON: SATURDAY, JULY 23, 1949

Intermittent Venous Occlusion

Knowledge of obstructive peripheral vascular disease presents a curious paradox. On the one hand there is a wealth of scientific detail concerning the normal and pathological physiology of limb circulation, and on the other almost total ignorance of the causes of thrombo-angiitis obliterans and arteriosclerosis obliterans—the two conditions which cause most non-traumatic obstructive incidents. Indeed diagnosis, in the ætiological sense, is precise only in the embolic group. For treatment a great number of procedures have been evolved with the common aim of minimising tissue anoxæmia by either improving the circulation or diminishing the tissue oxygen requirements; and the multiplicity and differing character of these methods indicates their imperfection. Fortunately, powerful natural mechanisms, such as the vasodilatation of anoxæmia and the growth of collateral arteries, compensate, often with remarkable success, for the effects of arterial obliteration.

One of the many therapeutic methods tried is intermittent venous occlusion. As long ago as 1902 Cushing[1] advocated application of a tourniquet to combat the vasospasm of Raynaud's disease. In 1935 Jordan[2] elevated the affected leg and constricted the thigh with an ordinary sphygmomanometer cuff. Collens and Wilensky,[3] followed soon after by Brown and Arnott,[4] devised apparatus enabling a cuff to be inflated to a pressure of 40–80 mm. Hg in regular cycles of about 2 minutes "on" and 2 minutes "off." It was believed that treatment of this sort practised for several hours daily relieved the resting pain of a seriously ischæmic extremity, minimised intermittent claudication, and possibly accelerated the healing of ischæmic ulcers. Lewis and Grant[5] defined very exactly the increase in blood-flow which follows constriction of the limb for various periods at pressures ranging from complete arterial occlusion down to low levels of venous compression. Intermittent venous occlusion proved most effective at pressures below 80 mm. and often as low as 40 mm. Hg. It seems unlikely that the beneficial effects of compression derive from any transient production of vasodilator metabolites, in view of the high tissue concentration of such substances that must already prevail in the chronically ischæmic limb. Early workers were inclined to attribute the effects to reactive hyperæmia; but further work has not substantiated this theory. Allen and McKechnie[6] observed the digital skin temperature in lower limbs of normal and arterially obliterated patients, taking great care to avoid the action of other factors known to influence temperature; with intermittent-occlusion pressures ranging from 30 to 90 mm. Hg for up to two hours there was no evidence of significant vasodilatation. Veal and McCord,[7] who studied the arteriovenous oxygen differences in limbs subjected to similar treatment, found that complete vascular compression pressures raised the venous oxygen saturation, indicating increased blood-flow, whereas intermittent venous occlusion usually reduced the venous oxygen saturation. This study confirmed and extended the earlier observations of de Takats and others,[8] who found a similar reduction in concentration at intervals of 20–40 minutes after intermittent occlusion was stopped. Although these observations have not brought to light an increase in blood-flow, there remains an unlikely possibility that any vasodilator effect is limited to muscle blood-vessels: this could only be proved by plethysmographic methods. It would be foolish, however, to condemn the procedure because an obvious hypothesis of its mode of action has not been confirmed experimentally. It is easy to imagine other possibilities—for instance, the elevation of capillary pressure that must result from venous occlusion raises the effective filtration-pressure, which in obliterative arterial disease must be abnormally low.

Clinically the procedure has not yet been subjected to carefully controlled trial yielding quantitative data. Nevertheless from many sources comes evidence of its value; the very fact that it is still practised 13 years after its introduction suggests that it has some effect. The treatment has at least the merits that no harm ensues, except in moist gangrene, and patients can treat themselves with a minimum of supervision. Ambulant patients can have the treatment during the night; and provided the apparatus operates silently they soon learn to sleep through the gentle recurrent cycles of compression. For some years a British apparatus has been on sale or hire,[9] and on p. 154 Dr. Shillingford describes a newcomer to the field.

The Value of Hormone Assays

It may be said of the pregnancy test in the year of its coming of age that it has evolved into a most satisfactory youth of which the laboratory has reason to be proud. Six months ago we reviewed[10] the tests which have been introduced since Aschheim and Zondek's[11] basic discovery in 1928 that the increased urinary concentration of chorionic gonadotrophin appearing early in pregnancy and persisting throughout it can be reliably demonstrated by a laboratory method. That account ended with a mention of the two most recent modifications of this group of biological assays—the male-toad test, and the rat ovarian hyperæmia test.

At that time the male-toad test was mainly done on only a single species indigenous to South America, *Bufo arenarum* Hensel, which Galli Mainini[12] had shown would respond to the injection of urine containing pregnancy levels of chorionic gonadotrophin by "spermatogenesis," so that urine collected from the toad's cloaca within 3 hours of injection contains large numbers of spermatozoa. The great deal of work which has since been done on other toads indicates that this response is probably common to all anura. Thus *Bufo marinus*[13]; the common American leopard frog, *Rana pipiens*[14]; the common European edible frog, *R. esculenta*[15 16]; the common North American toad, *B. americanus*[17]; ordinary salientians found in India, such as *B. melanostictus*, *B. stomaticus*, and *R. tigerina*[18]; and finally the common English toad, *B. vulgaris*, on which **Klopper** and **Frank**[19] lately reported in these columns, have all proved as effective as the original South American toad. The rat test depends on the production of ovarian hyperæmia in the immature rat within a few hours of subcutaneous injection of pregnancy urine.[20 21] In the last few months **Albert**[22] has compared the results of this procedure with those of 1000 consecutive Friedman (rabbit) tests. He concludes that the Friedman test will detect concentrations of chorionic gonadotrophin in excess of 500 I.U. per 24-hour urine specimen, whereas the rat test is only half as sensitive and so may give "false negatives" in very early pregnancy; on the other hand, the rat test is likely to become negative before the Friedman test after abortion or fœtal death. **Zondek** and **Sulman**[23] have suggested that only some strains of rats, such as those used in Jerusalem and at the Mayo Clinic, will respond with ovarian hyperæmia, but A. C. **Crooke**, in the discussion on their paper, indicated that the rats he used at the London Hospital responded satisfactorily. Provided it is first established that the rats maintained for experimental purposes in the individual laboratory are sensitive, this is undoubtedly a simple and useful test. Both these tests, therefore, comply with the four criteria essential for the ideal pregnancy test—reliability, convenience, simplicity, and speed—and we may add a fifth criterion which they also fulfil: cheapness. Male toads are inexpensive, easy to keep, and may be used repeatedly; the technique of the test is almost fool-proof; the results are remarkably specific and can be reported to the clinician on the same day as the urine is received—in fact, it might be possible for the test to be performed actually in the outpatient clinic. The rat test might be even more convenient in a laboratory which has access to a large animal-house with a constant and plentiful supply of litters of young rats.

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[1] Cushing, H. *J. nerv. ment. Dis.* 1902, 29, 657.
[2] Jordan, H. *J. Bone Jt Surg.* 1935, 17, 1021.
[3] Collens, W. S., Wilensky, H. D. *Amer. Heart J.* 1936, 11, 721; *J. Amer. med. Ass.* 1936, 107, 1960.
[4] Brown, J. J. M., Arnott, W. M. *Brit. med. J.* 1937, i, 1106; *Ibid*, 1938, i, 616.
[5] Lewis, T., Grant, R. T. *Heart*, 1925, 12, 73.
[6] Allen, E. V., McKechnie, R. E. *J. Lab. clin. Med.* 1937, 22, 1260.
[7] Veal, J. R., McCord, W. M. *Amer. Heart J.* 1939, 17, 401.
[8] de Takats, G., Hick, F. K., Coulter, J. S. *J. Amer. med. Ass.* 1937, 108, 1951.
[9] 'Riedyne.' Obtainable from T. W. Forbes, 10, Craigleith Crescent, Edinburgh, 4.
[10] Leading article, *Lancet*, 1948, ii, 977.
[11] Aschheim, S., Zondek, B. *Klin. Wschr.* 1928, 7, 8.
[12] Galli Mainini, C. *Sem. méd., B. Aires*, 1947, 54, 337.

A very different picture is presented when one turns to the clinical value of pregnanediol estimations, which was discussed, perhaps prematurely and at too great a length, at the British Congress of Obstetrics and Gynæcology (see p. 164). As a pregnancy test, it was generally agreed that these estimations fulfilled none of the criteria mentioned above, and as a prognostic test for threatened abortion, or as a test to determine whether a series of repeated abortions are associated with progesterone deficiency, they had proved decidedly equivocal. Indeed, at the moment, the limited clinical usefulness of this highly technical, laborious, and specialised procedure scarcely seems to justify its further serious consideration. But there is much of interest and value to be learnt from a continued and intensified study of this urinary steroid. It is, for instance, already yielding, as Prof. **Marrian** hinted, novel conceptions concerning the metabolism and the effects of exogenous administration of progesterone. Such studies, however, are utterly unsuited to a routine biochemical department, and still more inappropriately dealt with in a large routine pathological laboratory. Nor do the irksome but essential details of the collection of the urine specimens lend themselves, as one of the speakers in this discussion pointed out, to the hurly-burly of gynæcological outpatients or the antenatal clinic; they would be more appropriately and more efficiently disposed of in a clinic dealing solely with "medical" gynæcology.

Other hormone assays are equally unsuited to the routine laboratory, the busy clinic, or the overworked and understaffed hospital ward. Estimations of 17-ketosteroids are increasingly demanded in the investigation of hirsutism and as an aid to diagnosis in Addison's disease, Simmonds's disease, and myxœdema, though the results are often treated with a respect which they neither deserve nor claim. Too little emphasis is placed by the unenlightened clinician on the wide variation in normal range, and he is too often dazzled by being presented with an absolute gravimetric measurement of this hormonal excretory product. Furthermore, the increasing demand for these estimations is apt to embarrass those biochemists who are known to undertake them. Many clinicians look on œstrogen assays as a logical and reasonable investigation to be undertaken in all sorts of menstrual and other disorders of possible ovarian origin. But in fact they would be significant only if the amount found in the urine was either nil or grossly in excess of normal. Zero figures would indicate ovarian failure but would not localise the primary lesion to the pituitary, on the one hand, or the ovary on the other. The only condition in which high figures would be of diagnostic value is granulosa-cell tumour of the ovary. From the laboratory point of view œstrogen assays are laborious and unsatisfactory. The chemical estimation, based on the Kober colorimetric technique, is still not sufficiently specific, and the biological assay is extravagant in the number of ovariectomised mice required. Furthermore, the figure obtained is only a crude "bracketing" result (more than so many mouse units and less than a larger number of mouse units). Finally, the urinary œstrogen figure represents only one point in the complicated metabolic cycle of œstrogens. The other hormone assay that may be of clinical value is the estimation of pituitary follicle-stimulating hormone (F.S.H.) in the urine. In cases of gonadal deficiency in which the primary lesion is in the gonad, as opposed to the pituitary, F.S.H. values are high. Where the lesion is primarily hypophyseal the F.S.H. value is nil. This would therefore be a most useful aid to the clinician. The biological test for F.S.H.—the production of enlarged follicles in immature rodents—is not very complicated, but a rather laborious preliminary chemical extraction of the urine is necessary, and the test is therefore seldom applied in this country.

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13. Lima, O. R., Pereira, O.G. *Nature, Lond.* 1948, **161**, 676.
14. Wiltberger, P. B., Miller, D. F. *Science*, 1948, **107**, 198.
15. Hinglais, H., Hinglais, M. *C.R. Acad. Sci., Paris*, 1948, **226**, 1011.
16. Aznar-Ferreres, J. *Nature, Lond.* 1949, **163**, 881.
17. McCallin, P. F., Whitehead, R. W. *Science*, 1949, **109**, 518.
18. Bhaduri, J. L., Bardhan, N. R. *Ibid*, p. 517.
19. Klopper, A., Frank, H. *Lancet*, July 2, p. 9.
20. Salmon, U. J., Geist, S. H., Salmon, A. A., Frank, I. L. *J. clin Endocrinol.* 1942, **2**, 167.
21. Zondek, B., Sulman, F., Black, R. *J. Amer. med. Ass.* 1945, **128**, 939.
22. Albert, A. *Proc. Mayo Clin.* 1949, **24**, 259.
23. Zondek, B., Sulman, F. *J. Endocrinol.* 1948, **5**, proc. lxxxviii.

The remedy for all these difficulties is obvious. Instead of straining the imagination and obligations of the busy practising gynæcologist or physician in his routine day-to-day work, these problems, at any rate for the time being, should be "seconded" to special endocrine units, of which some already exist. In addition, special endocrine laboratory units, staffed by the best endocrine biochemists and biologists, adequately remunerated both in actual salary and future prospects and assisted by technicians sufficient in number and dexterity to fulfil their declared needs, should be set up. Such clinical laboratory endocrine units would do valuable and progressive research and would, at their leisure, clear the snags from routine hormone assays so that they became part of the smooth collaboration between clinician and laboratory worker.

Cortisone: Results and Possibilities

Rheumatoid arthritis has been regarded by most physicians as an essentially progressive disease: though patients sometimes recover, either under treatment or spontaneously (e.g., in pregnancy or jaundice), recovery has been generally considered exceptional. In his Heberden oration last year Hench[1] argued that this attitude towards the disease should be altered: the physiological changes, at all stages, should be looked on as potentially reversible, and only the anatomical changes in late cases should be accepted as permanent. The soundness of this thesis has been proved by the dramatic work since reported by himself and his associates at the Mayo Clinic. In an attempt to reverse the rheumatic process, they used 17-hydroxy-11-dehydrocorticosterone (Kendall's compound E, now known as 'Cortisone'), and the results exceeded all expectations. Their report[2] on the first 14 cases of rheumatoid arthritis treated shows that in all of them the effect, within a few days, was reduction of stiffness, lessening of pain, and improvement of muscular and articular function: appetite and weight increased, and the patients had a sense of well-being, even to euphoria. On the objective side, the sedimentation-rate fell rapidly, serum proteins were restored to normal, and in anæmic patients there was some rise in hæmoglobin values.

The cortisone was usually given in the form of acetate, and the dose was usually 300 mg. for an initial injection, followed by 100 mg. daily: in some cases 75 mg. was used, but doses of 25 or 50 mg. were ineffective. Unfortunately, a few days after the injections were discontinued, symptoms returned in the majority of patients; and the evidence so far suggests that the treatment may have to continue for life. Side-effects were usually mild, the chief being transient œdema; but in one case, after about three months, there were repeated sudden weight gains of 4–7 lb., and equally sudden weight losses through diuresis (suggesting a disturbance of electrolyte metabolism), acne, mild hirsutism, and rounding of facial contour, with amenorrhœa. In 2 further patients treated with 100 mg. daily of anterior-pituitary adrenocorticotrophic hormone (A.C.T.H.) the improvement was as remarkable as with cortisone, but side-effects were much more troublesome—notably, a sense of exhaustion, transient gas pains, heaviness in the chest, and a rise of blood-pressure. Various other adrenal hormones are under trial, and meanwhile cortisone has been used,[3] with equally striking results, in 3 cases of acute rheumatic fever: its administration for periods of from three to five weeks was associated with rapid disappearance of all clinical symptoms, and return of sedimentation-rate and electrocardiographic patterns to normal, and the hope is expressed that the effect on the cardiac muscle and valves in this disease will be as beneficial as the effect on the fibrous tissue in rheumatoid arthritis. Unlike the patients with rheumatoid arthritis, those with rheumatic fever did not show any early return of symptoms; but the period between cessation of treatment and publication of the preliminary report was very short.

Clearly, we can acclaim a therapeutic discovery of first importance, and it is one that arouses many speculations. Firstly, is cortisone therapy simply replacement therapy? Probably not; for it seems unlikely that normal adrenals produce anything like 100 mg. of the hormone daily. Perhaps the true active agent is something else, and the body is able to convert only a small fraction into the active agent x; or perhaps x is not produced from cortisone at all, and cortisone has an x-like activity at a very much lower level. (Kendall's careful work on purification of the adrenal hormones makes it improbable that cortisone is merely a carrier for traces of the active agent x.) Secondly, the question of side-effects has to be considered. Admittedly, they were serious in only 1 of the treated patients; but only 4 of them had received the hormone for as long as three months, and longer treatment may easily bring greater difficulties. The side-effects of A.C.T.H. were much more conspicuous, as might be expected from a hormone which stimulates the production of more than one adrenal product: such a compound as desoxycorticosterone, in massive doses over a long period, would be expected to produce changes in electrolyte metabolism and a rise in blood-pressure. Thirdly, apart from rheumatic fever and rheumatoid arthritis, there are a number of diseases of unknown ætiology in which it would be interesting to know the action of cortisone. Hench cites the arthritis of lupus erythematosus, of ulcerative colitis, and of psoriasis as possible further examples of temporary deficiencies of adrenal hormone. One would like to know whether such conditions as periarteritis nodosa, serum-sickness, and even some forms of nephritis, will respond; but these questions are not likely to be answered for some time. Though the amazing results obtained by Hench and his colleagues will make everyone want to be in a position to repeat them at the earliest opportunity, we must again quote the statement that "Merck and Co. Inc., . . . regret that because of the exigencies of manufacture, no supplies of Compound E are expected for treatment or additional research until sometime in 1950 at the earliest . . .", a view which the Lord President of the Council confirms in a Parliamentary reply on p. 177.

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[1] Hench, P. S. *Ann. rheum. Dis.* 1949, 8, 90.

[2] Hench, P. S., Kendall, E. C., Slocumb, C. H., Polley, H. F. *Ibid*, p. 97.

[3] Hench, P. S., Slocumb, C. H., Barnes, A. R., Smith, H. L., Polley, H. F., Kendall, E. C. *Proc. Mayo Clin.* 1949, 24, 277

Annotations

P.R.C.S.

DIFFERENT people serve the profession in widely different ways. Of Lord Webb-Johnson's contributions to medicine, probably the greatest have been indirect and remain to be realised; for his constant endeavour has been to improve conditions of training and work for the younger generation. He believes in the importance of good environment, alike for education, for research, and for practice, and this belief has found expression both at Middlesex Hospital and at the Royal College of Surgeons, whose presidency he now resigns after eight fruitful years. As a transformer of ancient institutions he has succeeded largely because he can infect others with his enthusiasm; and his hospital and college owe many of their biggest benefactions to his faculty of persuasion. But if a succession of industrial leaders have been happy to provide money for his projects it is because these projects, both great and small, have been at once imaginative and sound. A long series of innovations at the Royal College of Surgeons, including the Nuffield College of Surgical Sciences soon to be constructed, bear witness to a vigour and vision that ensure him a high place among its presidents.

Of Lord Webb-Johnson's contribution to the solution of the medico-political problems of the past few years it would be premature to speak; but here, as in the college itself, his successor, Sir Cecil Wakeley, inherits large responsibilities as well as large opportunities. We wish the new president the success to which in so many fields he is already accustomed.

TRENDS IN CANCER RESEARCH

THE pursuits grouped under the term "cancer research" are so varied and recondite that no one reviewer can appraise all of them. Some trends are easier to discern. One that becomes clear is that in those centres supported by the British Empire Cancer Campaign and based on university departments there is a tendency to deviate into problems of the basic sciences concerned. Thus observations are recorded in the campaign's annual report[1] for 1948, in physical, radiological, chemical, and biochemical sciences which can be judged only by specialists in each field. The relation of the observations to cancer research is not necessarily urgent or even apparent, yet the net thus widely and wisely cast may bring a rich catch of new data of general scientific value by virtue of the subjects tackled and academic standards set. None can tell in what direction the cause and cure of the disease will be found; therefore all evidence as it comes to hand is better tested by the most vigorous methods and as dispassionately as possible, emotional reactions being directed rather at methods of arriving at conclusions than at the conclusions themselves.

In the present report clinical investigations follow traditional lines and include another of the campaign's valuable statistical analyses of cancer, this year of the ovary, vulva, and female urethra, while Sir Ernest Kennaway, F.R.S., and his colleagues continue to throw light on the social incidence of factors affecting tumours of exposed sites, this year of the skin and lip. Cancer of the lip, like that of the scrotum, can be largely eliminated by the conditions of life of the richer classes. Whether this is because new growths of the lip get early attention, for cosmetic reasons, in the more favoured classes is undecided. A general trend in relation to therapy is to obtain more detailed knowledge and control of all promising physical and chemical agents. This is especially evident at the Royal Cancer Hospital.

Contributions to experimental pathology show the fertilising influence of the conception, originated by Peyton Rous, of analysis into initiating and promoting phases of the cancer process. The promoting influence of croton oil, previously studied by I. Berenblum in relation to chemical carcinogenesis of skin tumours, has now been extended by F. R. Selbie to virus tumours, by C. B. Allsopp to water-soluble derivatives of benzpyrene, and by F. Bielchowsky to induced thyroid tumours. Many workers must feel grateful to F. C. Pybus and E. W. Miller for their laborious undertaking to isolate a number of inbred lines of mice, each characterised by a different type of tumour, and in particular to endeavour to repeat Strong's induction of glandular carcinoma of the stomach by methylcholanthrene with the appearance of this tumour as a gene mutant in subsequent untreated generations of offspring. Much time, space, and labour will be required before any conclusion can be reached about this curious observation. These workers have found no type of neoplasm in an injected animal which has not also been seen in an untreated control. There is no evidence that methylcholanthrene intensified the incidence of any tumour except stomach papillomas and lung adenomas.

Finally, a trend to attract, if not create, first-class brains, with £ *s*. *d*. is disclosed by the founding of highly paid senior and junior fellowships in cancer research. This is all to the good. These gifted people will immediately see, what is already apparent to others, that cancer research up to the present has been lacking not only in security of tenure but also in certain basic facilities. Coming into the subject with freshness and independent status, their diagnosis may be heard. Of these deficiencies the gravest are in: (1) housing for large stocks of animals, and (2) staff to care for them; and these take precedence over other difficulties of supply. Although the question of breeding large healthy stocks of strains and species is being solved by establishments in Edinburgh and at Chalfont St. Giles supported by the B.E.C.C., it is always necessary to have an adequate local pool of reserves as well as properly housed and tended experimental stock. It may be noted that members of the Scientific Advisory Committee represent for the most part those institutions where, through foresight of directors and administrators, adequate housing exists. Unless these institutions can absorb all the first-class brains there is likely to be much frustration and disappointment. It is of course undeniable that with clear heads many issues in cancer causation might be cleared up, in the absence of these elemental facilities, by statistical analysis and philosophical discussion of existing data; but new knowledge of the nature of cancer will be gained faster by that special tool of our day—the experimental method and its proper controls.

MUSCULAR CONTRACTION, 1949

THE mechanism of muscular contraction has always baffled and absorbed physiologists. For some time it has held a leading place in their interests, but gradually the force tackling this problem has changed; the shock troops now are protein chemists, electrical engineers, biophysicists, X-ray crystallographers—experts in the energetics of rubber and the detection of infinitesimal amounts of chemical compounds. On July 7 the general staff met at the Royal Society, the principal question discussed being: What chemical event initiates or is associated with the contraction of the muscle-fibre?

Prof. A. V. Hill, F.R.S., speaking of the biophysical findings, explained that the elementary unit of muscular activity is the single muscle twitch. Therein lies the difficulty of analysis, for the twitch is an exceedingly rapid affair; in striated muscle at normal body-temperatures it is over in a few milliseconds. Even using slow unstriated muscles at 0°C, the events are still too fast to be followed by chemical methods; there are in fact no chemical data whatever on what happens during a single twitch. Physical methods, of which the majority have been devised by Hill himself, can follow easily and accurately the heat-production during and after the twitch, the tension development, and electrical and optical changes. Though very hard to interpret, these physical data are clear and reliable. More than anything else they provide a framework into which chemical theories must fit. Some theories can thus be discarded, but more than one can be more or less squared with the physicist's findings.

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[1] Issued from 11, Grosvenor Crescent, Hyde Park Corner, London, S.W.1.

The fundamental event in contraction is the shortening of a particular protein molecule in the myofibril. Prof. H. H. Weber, of Tübingen, observed at the meeting that muscle contains several proteins, of which apparently only two—actin and myosin—are concerned in the actual contractile process. A possible model of the process was given in a communication by Prof. W. T. Astbury F.R.S. Imagine two strips of paper stretching parallel to each other from north to south, and turned edge-on to the observer. Fold each of them like a concertina, so that each is crinkled, running first south-east then south-west, then south-east, and so on. These represent the myosin molecules in the relaxed state. Between these two scatter some tennis-balls—the globular form of actin. When the muscle contracts, said Astbury, the actin tennis-balls arrange themselves in chains, one sticking to another in a straight north-south line; this is now the fibrous form of actin. At the same time the myosin molecule shortens with a concertina action; the crinkles instead of running south-east and south-west run more nearly east and west, and the edges of the crinkles now touch the actin chain. Astbury was led to this picture by X-ray studies, but not all workers in this field agree that it is true. What is needed, he holds, is an X-ray study of muscle actually while it twitches; but here, as in chemical studies, technical difficulties supervene.

What is it, then, that causes the change in form of the actin and myosin molecules and their association? This is the central question, to which there is still no answer. When a nerve impulse reaches the neuromuscular junction a wave of activity spreads down the surface membrane of the fibre, very much as an impulse travels down a nerve. Somehow this surface diminution of electric charge sets off the contractile mechanism in the interior of the fibre; and probably the movement of ions is one of the links in the chain. But is this literally a trigger action? Is the muscle like a stretched spring waiting for a chance to contract—that is, to lower its potential energy? Is contraction or relaxation the more probable state, in the technical sense of the phrase? This is another question on which there is no agreement. Professor Hill holds strongly to the view that contraction is active and relaxation passive, and the relaxed state the lower in potential energy. From physical measurements he cited considerable evidence to support this view; but the evidence is not decisive, and many of the chemists had theoretical reasons for holding the opposite opinion. Since it is believed that the energy source of a twitch is the breakdown of adenosine triphosphate the crucial experiment would be to determine whether this substance breaks down during the contraction phase of the twitch or only when the twitch is over. This is asking too much of the chemists; Mrs. Dorothy Needham, F.R.S., indicated that new spectrophotometric methods might be able to detect chemical changes after a single twitch, but she held out no hope of establishing the time relations of the chemical events.

Bit by bit an intricate cat's-cradle of fact is being woven, but the shape of the cat still eludes us; and one can scarcely see the string for the holes. Not that there is anything mysterious or unique about muscular activity; as Professor Astbury emphasised, the contractile muscular protein molecules are only a special adaptation in a general group which includes keratin, fibrinogen, and the epidermal protein of mammals. In human hair there persists the skeleton of muscle-fibres—the machine without the fire to drive—so the permanent wave has some relation to the athlete's strength.

EFFECTS OF HEAT AND HUMIDITY IN DEEP MINES

AT the first post-war Empire Mining and Metallurgical Congress, the technical sessions of which were held at Oxford from July 12 to 16, interest in man's reactions to underground environments was intensified because of the various factors now increasing the difficulties of the mining industry. Not only is it becoming more difficult in different parts of the world to attract labour into the mines, but it is apparent that in South Africa, India, and even Britain heat and humidity in the deeper mines diminish working efficiency to an unknown extent. By contrast with the outstanding success of personnel research during the war on similar subjects, the mining industries have lagged behind in organising heat physiology units, not only in this country but also in South Africa.

The problems discussed must have left little doubt of the urgent need for further physiological information. A survey of the environmental conditions in British coalmines by Mr. A. E. Crook, Mr. F. Edmond, Mr. J. Ivon Graham, and Mr. B. R. Lawton revealed that in Britain a wet-bulb temperature of 85°F had been reached at 3000 feet below the surface. It was agreed on theoretical grounds by Sir David Brunt, F.R.S., and from Dr. A. Caplan's experience in India, that efficiency for strenuous work falls off at wet-bulb temperatures of 83–85°F. Caplan and J. K. Lindsay assessed the fall in muscular efficiency as 20% at a wet-bulb temperature of 87°F, and at similar temperatures Mackworth has demonstrated a reduction in psychological performance. It might be inferred from the agreement between Caplan and Brunt that Indian mineworkers work at a level of energy output defined as strenuous—i.e., about 300 Kcal./m²/hr. This would be surprising in the light of Dr. J. S. Weiner's observations on the working ability of Bantu mine-labourers in hot humid conditions. Weiner demonstrated that "raw" and "experienced" Bantu are less well adapted to hot humid environments than young healthy Europeans, acclimatised in experimental chambers. It is suggested that Bantu labourers normally work at a lower energy output than that of the acclimatisation routine (110 Kcal./m²/hr.). There is no information on the energy output at the various tasks in mining. This extraordinary gap in our knowledge delays the use by ventilation engineers and physiologists of Brunt's integration into a vastly improved thermal balance equation of the factors concerned in heat-production and its transmission to and dissipation from the body surface to the environment. Thermal balance may be expressed simply as:

$$\begin{array}{c}\text{Heat-production}\\ +\ \text{heat-storage}\end{array} = \begin{array}{c}\text{heat-loss by evaporation}\\ +\ \text{convection} + \text{radiation.}\end{array}$$

But energy exchanges by convection and radiation cannot be measured directly. C. E. A. Winslow, in 1941, determined these factors experimentally, in terms of mean temperature of the skin and the walls and the dry-bulb thermometer reading. Brunt has integrated Winslow's with his earlier work and expressed convection, evaporation, and radiation in terms of readily measurable quantities, thus:

$$\begin{array}{c}\text{Heat-production}\\ +\ \text{heat-storage}\end{array} = 3{\cdot}6\,(T_s - T_r) + 66{\cdot}7\sqrt{v}\,(I_s - I_w)$$

where T_s is mean skin temperature; T_r is mean temperature of walls; I_s and I_w are the total heat content of unit mass of dry air, *plus* the water required to saturate it, at skin temperature of the wet-bulb thermometer of the ambient air.

Annotations

P.R.C.S.

DIFFERENT people serve the profession in widely different ways. Of Lord Webb-Johnson's contributions to medicine, probably the greatest have been indirect and remain to be realised; for his constant endeavour has been to improve conditions of training and work for the younger generation. He believes in the importance of good environment, alike for education, for research, and for practice, and this belief has found expression both at Middlesex Hospital and at the Royal College of Surgeons, whose presidency he now resigns after eight fruitful years. As a transformer of ancient institutions he has succeeded largely because he can infect others with his enthusiasm; and his hospital and college owe many of their biggest benefactions to his faculty of persuasion. But if a succession of industrial leaders have been happy to provide money for his projects it is because these projects, both great and small, have been at once imaginative and sound. A long series of innovations at the Royal College of Surgeons, including the Nuffield College of Surgical Sciences soon to be constructed, bear witness to a vigour and vision that ensure him a high place among its presidents.

Of Lord Webb-Johnson's contribution to the solution of the medico-political problems of the past few years it would be premature to speak; but here, as in the college itself, his successor, Sir Cecil Wakeley, inherits large responsibilities as well as large opportunities. We wish the new president the success to which in so many fields he is already accustomed.

TRENDS IN CANCER RESEARCH

THE pursuits grouped under the term "cancer research" are so varied and recondite that no one reviewer can appraise all of them. Some trends are easier to discern. One that becomes clear is that in those centres supported by the British Empire Cancer Campaign and based on university departments there is a tendency to deviate into problems of the basic sciences concerned. Thus observations are recorded in the campaign's annual report [1] for 1948, in physical, radiological, chemical, and biochemical sciences which can be judged only by specialists in each field. The relation of the observations to cancer research is not necessarily urgent or even apparent, yet the net thus widely and wisely cast may bring a rich catch of new data of general scientific value by virtue of the subjects tackled and academic standards set. None can tell in what direction the cause and cure of the disease will be found; therefore all evidence as it comes to hand is better tested by the most vigorous methods and as dispassionately as possible, emotional reactions being directed rather at methods of arriving at conclusions than at the conclusions themselves.

In the present report clinical investigations follow traditional lines and include another of the campaign's valuable statistical analyses of cancer, this year of the ovary, vulva, and female urethra, while Sir Ernest Kennaway, F.R.S., and his colleagues continue to throw light on the social incidence of factors affecting tumours of exposed sites, this year of the skin and lip. Cancer of the lip, like that of the scrotum, can be largely eliminated by the conditions of life of the richer classes. Whether this is because new growths of the lip get early attention, for cosmetic reasons, in the more favoured classes is undecided. A general trend in relation to therapy is to obtain more detailed knowledge and control of all promising physical and chemical agents. This is especially evident at the Royal Cancer Hospital.

Contributions to experimental pathology show the fertilising influence of the conception, originated by Peyton Rous, of analysis into initiating and promoting phases of the cancer process. The promoting influence of croton oil, previously studied by I. Berenblum in relation to chemical carcinogenesis of skin tumours, has now been extended by F. R. Selbie to virus tumours, by C. B. Allsopp to water-soluble derivatives of benzpyrene, and by F. Bielchowsky to induced thyroid tumours. Many workers must feel grateful to F. C. Pybus and E. W. Miller for their laborious undertaking to isolate a number of inbred lines of mice, each characterised by a different type of tumour, and in particular to endeavour to repeat Strong's induction of glandular carcinoma of the stomach by methylcholanthrene with the appearance of this tumour as a gene mutant in subsequent untreated generations of offspring. Much time, space, and labour will be required before any conclusion can be reached about this curious observation. These workers have found no type of neoplasm in an injected animal which has not also been seen in an untreated control. There is no evidence that methylcholanthrene intensified the incidence of any tumour except stomach papillomas and lung adenomas.

Finally, a trend to attract, if not create, first-class brains, with £ *s. d.* is disclosed by the founding of highly paid senior and junior fellowships in cancer research. This is all to the good. These gifted people will immediately see, what is already apparent to others, that cancer research up to the present has been lacking not only in security of tenure but also in certain basic facilities. Coming into the subject with freshness and independent status, their diagnosis may be heard. Of these deficiencies the gravest are in: (1) housing for large stocks of animals, and (2) staff to care for them; and these take precedence over other difficulties of supply. Although the question of breeding large healthy stocks of strains and species is being solved by establishments in Edinburgh and at Chalfont St. Giles supported by the B.E.C.C., it is always necessary to have an adequate local pool of reserves as well as properly housed and tended experimental stock. It may be noted that members of the Scientific Advisory Committee represent for the most part those institutions where, through foresight of directors and administrators, adequate housing exists. Unless these institutions can absorb all the first-class brains there is likely to be much frustration and disappointment. It is of course undeniable that with clear heads many issues in cancer causation might be cleared up, in the absence of these elemental facilities, by statistical analysis and philosophical discussion of existing data; but new knowledge of the nature of cancer will be gained faster by that special tool of our day—the experimental method and its proper controls.

MUSCULAR CONTRACTION, 1949

THE mechanism of muscular contraction has always baffled and absorbed physiologists. For some time it has held a leading place in their interests, but gradually the force tackling this problem has changed; the shock troops now are protein chemists, electrical engineers, biophysicists, X-ray crystallographers—experts in the energetics of rubber and the detection of infinitesimal amounts of chemical compounds. On July 7 the general staff met at the Royal Society, the principal question discussed being: What chemical event initiates or is associated with the contraction of the muscle-fibre?

Prof. A. V. Hill, F.R.S., speaking of the biophysical findings, explained that the elementary unit of muscular activity is the single muscle twitch. Therein lies the difficulty of analysis, for the twitch is an exceedingly rapid affair; in striated muscle at normal body-temperatures it is over in a few milliseconds. Even using slow unstriated muscles at 0°C, the events are still too fast to be followed by chemical methods; there are in fact no chemical data whatever on what happens during a single twitch. Physical methods, of which the majority have been devised by Hill himself, can follow easily and accurately the heat-production during and after the twitch, the tension development, and electrical and optical changes. Though very hard to interpret, these physical data are clear and reliable. More than anything else they provide a framework into which chemical theories must fit. Some theories can thus be discarded, but more than one can be more or less squared with the physicist's findings.

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[1] Issued from 11, Grosvenor Crescent, Hyde Park Corner, London, S.W.1.

The fundamental event in contraction is the shortening of a particular protein molecule in the myofibril. Prof. H. H. Weber, of Tübingen, observed at the meeting that muscle contains several proteins, of which apparently only two—actin and myosin—are concerned in the actual contractile process. A possible model of the process was given in a communication by Prof. W. T. Astbury F.R.S. Imagine two strips of paper stretching parallel to each other from north to south, and turned edge-on to the observer. Fold each of them like a concertina, so that each is crinkled, running first south-east then south-west, then south-east, and so on. These represent the myosin molecules in the relaxed state. Between these two scatter some tennis-balls—the globular form of actin. When the muscle contracts, said Astbury, the actin tennis-balls arrange themselves in chains, one sticking to another in a straight north-south line; this is now the fibrous form of actin. At the same time the myosin molecule shortens with a concertina action; the crinkles instead of running south-east and south-west run more nearly east and west, and the edges of the crinkles now touch the actin chain. Astbury was led to this picture by X-ray studies, but not all workers in this field agree that it is true. What is needed, he holds, is an X-ray study of muscle actually while it twitches; but here, as in chemical studies, technical difficulties supervene.

What is it, then, that causes the change in form of the actin and myosin molecules and their association? This is the central question, to which there is still no answer. When a nerve impulse reaches the neuromuscular junction a wave of activity spreads down the surface membrane of the fibre, very much as an impulse travels down a nerve. Somehow this surface diminution of electric charge sets off the contractile mechanism in the interior of the fibre; and probably the movement of ions is one of the links in the chain. But is this literally a trigger action? Is the muscle like a stretched spring waiting for a chance to contract—that is, to lower its potential energy? Is contraction or relaxation the more probable state, *in the technical sense of the phrase*? This is another question on which there is no agreement. Professor Hill holds strongly to the view that contraction is active and relaxation passive, and the relaxed state the lower in potential energy. From physical measurements he cited considerable evidence to support this view; but the evidence is not decisive, and many of the chemists had theoretical reasons for holding the opposite opinion. Since it is believed that the energy source of a twitch is the breakdown of adenosine triphosphate the crucial experiment would be to determine whether this substance breaks down during the contraction phase of the twitch or only when the twitch is over. This is asking too much of the chemists; Mrs. Dorothy Needham, F.R.S., indicated that new spectrophotometric methods might be able to detect chemical changes after a single twitch, but she held out no hope of establishing the time-relations of the chemical events.

Bit by bit an intricate cat's-cradle of fact is being woven, but the shape of the cat still eludes us; and one can scarcely see the string for the holes. Not that there is anything mysterious or unique about muscular activity; as Professor Astbury emphasised, the contractile muscular protein molecules are only a special adaptation in a general group which includes keratin, fibrinogen, and the epidermal protein of mammals. In human hair there persists the skeleton of muscle-fibres—the machine without the fire to drive—so the permanent wave has some relation to the athlete's strength.

EFFECTS OF HEAT AND HUMIDITY IN DEEP MINES

AT the first post-war Empire Mining and Metallurgical Congress, the technical sessions of which were held at Oxford from July 12 to 16, interest in man's reactions to underground environments was intensified because of the various factors now increasing the difficulties of the mining industry. Not only is it becoming more difficult in different parts of the world to attract labour into the mines, but it is apparent that in South Africa, India, and even Britain heat and humidity in the deeper mines diminish working efficiency to an unknown extent. By contrast with the outstanding success of personnel research during the war on similar subjects, the mining industries have lagged behind in organising heat physiology units, not only in this country but also in South Africa.

The problems discussed must have left little doubt of the urgent need for further physiological information. A survey of the environmental conditions in British coalmines by Mr. A. E. Crook, Mr. F. Edmond, Mr. J. Ivon Graham, and Mr. B. R. Lawton revealed that in Britain a wet-bulb temperature of 85°F had been reached at 3000 feet below the surface. It was agreed on theoretical grounds by Sir David Brunt, F.R.S., and from Dr. A. Caplan's experience in India, that efficiency for strenuous work falls off at wet-bulb temperatures of 83–85°F. Caplan and J. K. Lindsay assessed the fall in muscular efficiency as 20% at a wet-bulb temperature of 87°F, and at similar temperatures Mackworth has demonstrated a reduction in psychological performance. It might be inferred from the agreement between Caplan and Brunt that Indian mineworkers work at a level of energy output defined as strenuous—i.e., about 300 Kcal./m²/hr. This would be surprising in the light of Dr. J. S. Weiner's observations on the working ability of Bantu mine-labourers in hot humid conditions. Weiner demonstrated that "raw" and "experienced" Bantu are less well adapted to hot humid environments than young healthy Europeans, acclimatised in experimental chambers. It is suggested that Bantu labourers normally work at a lower energy output than that of the acclimatisation routine (110 Kcal./m²/hr.). There is no information on the energy output at the various tasks in mining. This extraordinary gap in our knowledge delays the use by ventilation engineers and physiologists of Brunt's integration into a vastly improved thermal balance equation of the factors concerned in heat-production and its transmission to and dissipation from the body surface to the environment. Thermal balance may be expressed simply as:

$$\begin{array}{c}\text{Heat-production}\\ +\ \text{heat-storage}\end{array} = \begin{array}{c}\text{heat-loss by evaporation}\\ +\ \text{convection} + \text{radiation.}\end{array}$$

But energy exchanges by convection and radiation cannot be measured directly. C. E. A. Winslow, in 1941, determined these factors experimentally, in terms of mean temperature of the skin and the walls and the dry-bulb thermometer reading. Brunt has *integrated* Winslow's with his earlier work and expressed convection, evaporation, and radiation in terms of readily measurable quantities, thus:

$$\begin{array}{c}\text{Heat-production}\\ +\ \text{heat-storage}\end{array} = 3{\cdot}6\,(T_s - T_r) + 66{\cdot}7\sqrt{v}\,(I_s - I_w)$$

where T_s is mean skin temperature; T_r is mean temperature of walls; I_s and I_w are the total heat content of unit mass of dry air, *plus* the water required to saturate it, at skin temperature of the wet-bulb thermometer of the *ambient air*.

On the basis of the body temperature reaching a steady state—i.e., when heat-storage = 0—Brunt produced a nomogram for the limiting environmental conditions in terms of wet-bulb temperature and temperature of the walls for three different rates of energy production. Experimental verification of these limiting conditions is found in S. Robinson's work in the United States. There is an obvious advantage, either from a physiological or an engineering point of view, in being able to measure in heat units the heat-load of the environment on the human body. Previous scales of warmth have assessed equivalent effects and relative severity of various combinations of heat, humidity, and air movement in terms of single physiological effects such as the subjective sensation of warmth (effective temperature scale) or of the sweat-output in 4 hours at a standard work-rate (predicted 4-hourly sweat-rate). Dr. A. O. Dreosti's pioneer work in 1932 on acclimatisation and on the "heat-tolerance test," has been amply verified in the reduction in deaths from heat-stroke. Investigation of recent heat deaths in South African mines shows that each was due to some departure from Dreosti's rules.

HOSPITAL ADMINISTRATION IN NEW ZEALAND

THE hospitals of New Zealand are governed by forty-two boards elected directly by the people in much the same way that local councils are elected in Britain. These boards were first set up in 1910, since when the development of road and air transport and the changes in population distribution and the size of homes and families, to say nothing of medical progress, have quite outmoded the original conception of separate bodies serving fairly small isolated populations.

The need for early reorganisation is argued by Mr. Selwyn Morris and Mr. Douglas Robb[1]—two surgeons who have already contributed much to our understanding of the health service in their country. In their words,

> "the things that are wrong now are mainly due to faulty organisation. They include the too large number of too small and unrelated administrative units. The constitution of the Hospital Boards in being wholly selected by popular vote, the unchecked overlap between general medical service and hospital work (both paid for by the Social Security Fund), the little use of the recovery or convalescent hospital and the polyclinic for specialist investigation, the little attention given to the care of the aged, and the division of authority between the local Hospital Board, on the one hand, and the Government Departmental Office, and the Ministerial Office in Wellington."

The solution they propose is the division of the country into six hospital regions each caring for some 300,000 people. These regions they believe would be large enough for autonomous development on a functional basis; each would provide all services except the super-specialties like brain or heart surgery. "In this way all the more specialised services are brought to the region, and so nearer home, and the regional board is obliged to provide itself with a full range of buildings, equipment, and professional skill. To make the regional unit smaller would make it incomplete and so partially dependent on remoter control and help." All the proposed administrative bodies, from the new local hospital boards through the regional boards to a central national hospitals' corporation, are designed to give representation not only to the people (indirectly through their local councils) but also to the doctors and nurses working in the service. The principal medical and nursing officers should, it is suggested, be included as full members of the board or corporation which they serve; while at regional and national levels there should be university representation. The national hospitals' corporation would include a representative of each region together with university and ministerial nominees, and it would deal with questions of national policy over such matters as clinical records, vital statistics, and diseases such as tuberculosis requiring some measure of national planning. It would also watch over the distribution of finance both for current expenditure and for capital works. A small peripatetic commission appointed by this corporation should advise (after the fashion of the University Grants Committee) on the allocation of funds.

The British reader of this pamphlet will find much to stimulate his interest, many problems common to our two countries, and many analogies in the solutions suggested to the methods we have been trying to initiate during this last year. Some problems only beginning to appear here—such as the extent to which a hospital outpatient department can properly be required to undertake duties within the scope and the terms of service of the general practitioner—have obviously been apparent in New Zealand much longer, though even there no solution seems to be in sight. Perhaps this particular problem will not be solved in either country without the development of health centres, and a division of function between these and the hospitals.

CONSULTANTS' AND SPECIALISTS' CONTRACTS

As reported in our issue of July 9, the Joint Committee, formed by the Royal Colleges and the British Medical Association, decided on July 5 to reopen discussions with the Ministry on three points—conciliation machinery and arbitration, facilities for private treatment in hospitals, and the remuneration of part-time clinical teachers. After receiving the Ministry's letter which we printed last week, the Joint Committee met representatives of the Ministry on July 18, when the following assurances were received:

Arbitration.—The Ministry has agreed:

(*a*) That no changes will be made in the terms and conditions of service without discussion in the appropriate part of the Whitley machinery, when established, and this will be established as soon as possible.

(*b*) That remuneration is a subject which is suitable for arbitration.

(*c*) That save in exceptional circumstances, and after the conciliation machinery of Whitley has been exhausted, issues of remuneration remaining in dispute will go either to arbitration or for inquiry and report by a committee.

(*d*) That the words "by the Minister of Health" will be deleted from the opening paragraph of the model contract, so that it would simply refer to the terms and conditions of service "determined from time to time."

Private Practice.—The Ministry reiterated its previous assurances that it was not its intention to place difficulties in the way of private practice. It has agreed that patients admitted to private hospital beds under section 5 of the Act will pay fees for professional attendance to part-time practitioners in addition to the maintenance charges; except where the patient is occupying accommodation under the proviso to section 5 (1)—i.e., on medical grounds.

The Ministry has also agreed that individual practitioners are free to leave untouched or to delete from the whole-time contract any of the clauses which are enclosed in square brackets, including clause 5 requiring attendance on patients occupying beds under section 5 of the Act who have not made *private arrangements under section 5 (2).*

Clinical Teachers.—Assurances, shortly to be made public, have been received on the arrangements for the remuneration of clinical teachers.

The Joint Committee decided, with the assent of the Ministry, to continue negotiations on a number of outstanding points. It feels that it is now able to advise hospital staffs to enter into permanent contracts.

SIR DOUGLAS COOKE, F.R.C.S., Conservative M.P. for South Hammersmith from 1931 to 1945, died in London on July 13 at the age of 70.

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[1] Hospital Reform in New Zealand. By Selwyn Morris and Douglas Robb. Auckland: Whitcombe & Tombs. Pp. 68.

CONGRESS OF OBSTETRICS AND GYNÆCOLOGY

THE twelfth British congress of obstetrics and gynæcology was held on July 6, 7, and 8, under the presidency Sir EARDLEY HOLLAND.

MODERN CÆSAREAN SECTION

At the first meeting Mr. C. MCINTOSH MARSHALL called that in 1921 Munro Kerr and Eardley Holland rveyed the operation of cæsarean section up to that me. Their survey had covered 4568 cæsarean sections ith a maternal mortality of 6·9%. A further survey, st completed, of 7762 cæsarean sections performed for l *indications in 16 maternity hospitals between 1943* d 1947 had recorded a maternal mortality of 0·99%. he total incidence of cæsarean section in the latest rvey was 6·2%. The incidence had increased owing several factors: toxæmia was now a major indication r the operation, which was also more widely used in lacenta prævia; moreover, there was a relative increase the use of elective cæsarean section among the large umber of abnormal confinements in the teaching ospitals, where these figures were collected. He ttributed the improvement in the results to wider mployment of *the lower-segment operation, to the use* f sulphonamides *and more recently* penicillin, and to lood-transfusion. Of the classical cæsarean section he as willing to speak only with great reserve, and in ublic never at all. He believed that with severe lminating toxæmia it was necessary to perform cæsarean ection in order to secure a living baby, and since 1934 e had regarded all cases of true pre-eclampsia as no less rgent than those of "acute abdomen." Half the fœtal ortality was in infants of women operated on for erious diseases such as placenta prævia, toxæmia, and iabetes. Even among the elective cases fœtal mortality as fairly high; no woman could be assured of a living hild by abdominal delivery, while for those operated on ate *in labour* the fœtal mortality was still greater. he lower-segment operation was always indicated with lacenta prævia, except its minor variations; he nearly lways diagnosed this complication by the history and bdominal findings and he did not think it necessary to ake a vaginal examination with its attendant risks. s to anæsthesia he did not insist as formerly on local nfiltration, for he believed that curare and cyclopropane ere improvements. At the Liverpool Maternity Hospital ost patients with severe cardiac disease were delivered y cæsarean section; between 1939 and 1948 there were 97 vaginal deliveries with a maternal mortality of 3·36%, nd 98 cæsarean sections with a maternal mortality f 2·04%.

Dr. NINIAN FALKINER thought that the incidence of æsarean section reported by Mr. Marshall was very igh; he could not agree to the performance of this peration for late toxæmia. The lower-segment operaion was undoubtedly preferable. In his figures the aternal mortality was: lower-segment 0·44%, classical ·28%.

Mr. A. W. PURDIE had investigated the incidence of æsarean section in the Middlesex county hospitals in 1943–47. His figures, from busy non-teaching hospitals, might be compared with Mr. Marshall's from the teaching hospitals. In the Middlesex county hospitals emergencies were never refused; there were altogether 1667 perations with 23 deaths, giving a maternal mortality f 1·38%. The incidence of cæsarean section in this roup was 3·23%, and 80% of these operations were of he lower-segment type.

Mr. FRANK STABLER said that some years ago Munro Kerr had observed that in view of a reported 12·3% maternal mortality from cæsarean section after the application of forceps, few would use this operation in preference to embryotomy. But Mr. Stabler had lately found from reports of the Glasgow Maternity Hospital for the same time that the maternal mortality after embryotomy was 20·7%; and in Newcastle during the last ten years there had been 33 cæsarean sections after forceps with one death. He believed that penicillin and sulphonamides would reduce the death-rate from embryotomy, but he doubted whether the rate could be reduced as low as that achieved with the lower-segment cæsarean section.

Dr. J. KEVIN FEENEY believed that far too many cæsarean sections were being performed. For disproportion, induction of labour was a very satisfactory method; and there should be fewer cæsarean sections for placenta prævia.

Prof. J. M. MUNRO KERR, who spoke at the president's invitation, said it was ridiculous for a man of his age to take part in a discussion on modern cæsarean section; the two series quoted by Mr. Marshall illustrated the evolution of cæsarean section, and he would like the congress to join with him in the hymn, "The strife is o'er, the battle won."

Prof. DUGALD BAIRD differed slightly from Mr. Marshall, and asked "Where do we go from here?" He was a little doubtful whether so many cæsarean sections were necessary, particularly where uterine inertia was an indication.

Prof. A. SUNDE (Oslo) said that in his hospital the incidence of cæsarean section had increased from 3% to 11%; the maternal mortality was 0·3%. In 60% disproportion was the indication, and in 18% placenta prævia. Contracted pelvis was rare in Norway, but nearly all the cases went to hospital for delivery. Cæsarean section was not performed for toxæmia or eclampsia; nor was elderly primaparity by itself regarded as an indication for the operation.

Prof. W. C. W. NIXON suggested that while it was all very well to say that too many cæsarean sections were being done, it was very important that a woman should not lose her first baby; and until there was a safe drug with which to counter uterine inertia it was right and proper to employ cæsarean section for this complication.

Mr. MARSHALL, in reply, pointed out that he personally did not perform all the 7000 cæsarean sections; and from Chicago there was a report of 1000 cæsarean sections, for all indications, with one death. He believed that an increase in the scope of the indications was justified by the greatly decreased mortality of the operation.

ENDOMETRIOSIS

At this session, with Prof. HILDA LLOYD in the chair, a guest paper was presented by Dr. JOE V. MEIGS (Massachusetts). He pointed out that endometriosis was no new disease; it was first described by von Recklinghausen in 1893. The lesions had since been recognised in many bizarre situations—the arm, the leg, and the pleura—and probably occurred unrecognised elsewhere. With regard to ætiology, Dr. Meigs reviewed Sampson's theory of reflux of endometrial debris through the fimbriated ends of the tubes; in passing, he emphasised that Sampson had never advocated castration as a treatment, but had merely observed that atrophy of the lesions followed this procedure. He himself favoured Meyer's theory that the lesions arose from the cœlomic epithelium; but it was possible that pieces of viable endometrium might be carried in the blood-stream, especially via the recently described vena caval bypass in the region of the vertebral column. Pain, acquired dysmenorrhœa, and infertility were the commonest presenting symptoms, and the stilbœstrol test might aid diagnosis. Treatment, he insisted, was essentially conservative. There was no place for castration; since castration caused unwelcome effects outside the cessation of sexual function, the ovaries should be left, even in a patient of 50. In lesions of the alimentary canal he favoured resection of gut rather than castration. As conservative surgery was so satisfactory, sex hormones were not needed in treatment. Dr. Meigs went on to consider the significance of endometriosis. What effect, he asked, had it on women? Was it the cause or the effect of infertility? It arose, he suggested, as the result of delay between the menarche and the first pregnancy; this delay was commonest in those social groups that were mainly affected by the disease.

PREGNANEDIOL IN THE URINE

This discussion was introduced by Prof. G. F. **Marrian**, F.R.S., who dealt with the biochemical aspect. *He concluded that the urinary excretion of pregnanediol* might not be quantitatively related to endogenous secretion of progesterone, and that theoretically estimations of urinary pregnanediol were of little clinical use.

Dr. G. I. M. **Swyer** reported the results of investigations into the clinical usefulness of pregnanediol assay: (1) as a diagnostic test for pregnancy; (2) as a prognostic test in threatened abortion; (3) as a test of the likelihood of labour being initiated by induction; and (4) as a diagnostic aid in complications of pregnancy. He concluded that in (1) and (3) it was unreliable; in (2) it might be useful as an indication for treatment with progesterone; while in (4) it might be of some value in cases of hydatidiform mole, where pregnanediol appeared to be absent from the urine. He did not think that urinary-pregnanediol assay had much to offer the clinician.

In the discussion Mr. S. **Bender** pointed out that indiscriminate progesterone therapy did not affect the outcome of threatened abortion; but administration of progesterone when the urinary pregnanediol was low significantly increased the salvage-rate.

Dr. P. M. F. **Bishop** believed that at present pregnanediol assays were too elaborate and time-consuming, calling for close coöperation between clinic and laboratory, and were of small clinical value. He suggested the establishment of special endocrine laboratories.

ESSENTIAL HYPERTENSION IN PREGNANCY

Mr. S. B. **Herd** was the chairman at this session; and the discussion was introduced by Prof. G. W. **Pickering**, who dealt mainly with the ætiology of hypertension. He underlined the paramount importance of familial predisposition, pointing out that this is inherited as a mendelian dominant. The onset was gradual, so there was little chance of investigating the manner in which the disease was contracted. He distinguished "benign" from "malignant" hypertension; with benign hypertension the diastolic pressure was usually less than 130 mm. Hg, whereas with malignant hypertension it exceeded this figure. Though arbitrary, this was a useful dividing-line. In the benign cases changes in the ocular fundus were mainly arteriosclerotic, whereas in the malignant cases the changes were those of albuminuric retinitis and there was also papillœdema and a raised cerebrospinal-fluid pressure. The benign cases ran a chronic course for many years, with death usually from cardiac failure, apoplexy, or intercurrent disease; whereas the malignant cases ran a short course with death from uræmia. The difference between the two was mainly one of degree. Hypertension was due to vasoconstriction, which was independent of nervous control. Discussing the part played by renin, he pointed out that in chronic hypertension the amount of this substance in renal blood was not increased; and the hypertension was likely to persist even when the original source of renin was removed by extirpating the ischæmic kidney. In a comparative study of hypertensive and non-hypertensive cases, cardiac output and the rate of blood-flow through most organs investigated did not differ greatly; but in hypertension the blood-flow was known to be diminished in the kidney and increased in muscle. He wished that this kind of investigation had been more widely extended to cases during pregnancy. About a third of hypertensive women showed an increase in their high blood-pressure and the onset of albuminuria during pregnancy and in a few of these malignant hypertension would appear. The stimulus for hypertension starting in pregnancy was probably chemical and the origin uterine or possibly the adrenal and pituitary glands. The trouble might originate in uterine ischæmia, though experimental results were so far inconclusive. The pressor substances did not appear to cross the placenta, and the fœtal blood-pressure remained normal. The cause of toxæmia was as great a mystery as ever.

Prof. F. J. **Browne** dealt mainly with the clinical aspects of hypertension in pregnancy. He estimated that it constituted 25% of all the toxæmias of pregnancy; the remaining 75% were made up of cases of pre-eclamptic toxæmia (70%) and chronic glomerular nephritis (5%). In diagnosing essential hypertension, previous history and the finding of a raised blood-pressure before the twentieth week were of paramount importance; pre-eclamptic toxæmia hardly ever started before the twentieth week. Of such cases 40% reached term successfully and produced a living child; 60%, however, suffered an exacerbation, and a fifth of these underwent a rise in blood-pressure sufficient to produce albuminuria. This point was usually reached at a systolic pressure of 160 mm. Hg, and thereafter the fœtus continued in hourly peril of intra-uterine death. The mechanism was spasm of the afferent arterioles supplying the glomeruli, which produced capillary anoxia and therefore leakage of albumin. The mechanism in the maternal constituents of the placenta was similar, anoxia leading to capillary rupture and retroplacental bleeding. The aim should be to keep the blood-pressure below this critical figure. Nevertheless many patients with a systolic blood-pressure of more than 180 mm. Hg went through their pregnancy successfully; in these cases some compensatory mechanism seemed to be at work. In women starting pregnancy with a blood-pressure of over 150/100 mm. Hg the chances of a living child were only one in three. As to reducing the blood-pressure below the critical figure, confinement to bed in hospital was still the principal method of treatment. Venesection, veratrum viride, and tetraethylammonium bromide were either insufficiently reliable or insufficiently safe to occupy a very important place. The obstetrical treatment resolved itself into the choice of method for terminating pregnancy and of the moment for doing so. He disliked rupture of the forewaters because of the softness of the baby's head. Episiotomy, if used, should be wide. At all costs morphine should be withheld; vitamin K might be useful in discouraging hæmorrhage in the newborn. He thought that classical cæsarean section still had a place in the delivery of toxæmic premature babies. Where the kidneys were sound and there was no advanced arteriosclerosis, sympathectomy afforded good hopes of improving the outlook in pregnancy. The prognosis for the child depended largely on the size of the placenta, and not wholly on the actual height of the blood-pressure. There was no significant difference in he incidence of hypertension between parous and non-parous women in the country as a whole, but 50% of patients who developed pre-eclampsia were likely to develop chronic hypertension. Of hypertensive women who became pregnant, 60% developed a superadded pre-eclampsia, and the condition of 30% would be permanently aggravated. Finally, hypertension was not aggravated by pregnancy unless pre-eclampsia was superadded.

Mr. G. F. **Gibberd** denounced " mutilating " operations on the nervous system in our present ignorance.

Mr. A. **Dickson Wright** described his experiences of sympathectomy in 45 cases of hypertension associated with pregnancy. All were severely incapacitated by hypertensive symptoms. In many the improvement after operation was dramatic, and on the whole the prognosis was better where hypertension was a direct sequel to pregnancy. Of his cases 3 had subsequently become pregnant and had gone successfully through their pregnancies, though one was now going downhill. He had not yet performed this operation during pregnancy.

Prof. R. J. **Kellar** regretted the lack of knowledge about the rate of blood-flow, especially to the uterus. The cardiac output was highest in mid-pregnancy—a period which coincided with the lowest phase of the blood-pressure. He had found a rise in cardiac output in 8 pre-eclamptic patients.

Mr. G. J. **Sophian** supported the view that renal sympathetic stimulation was the primary factor leading to the permanent residual lesions in the blood-vessels which perpetuated the hypertension.

Prof. T. N. A. **Jeffcoate** said that the risks to the child were due to interference with placental circulation, and these risks had to be nicely balanced against the risks inherent in prematurity from termination of pregnancy; in such cases cæsarean section might be indicated purely in the interests of the child. Of 1200 cases, 120 were delivered by cæsarean section; the worst cases were those so delivered, yet the fœtal survival figure actually equalled that in the mildest cases delivered normally at term.

PREGNANCY IN DIABETICS

At this meeting the chair was taken by Dr. **John Hewitt.** The discussion was introduced by Mr. **John Peel** and Dr. **W. G. Oakley.** Mr. Peel dealt with the obstetric aspect, while Dr. Oakley reviewed the problem from the viewpoint of the physician.

It was pointed out that, with the successful treatment of the juvenile and adolescent diabetic, a larger number of young diabetic women than hitherto were reaching child-bearing age. Nevertheless, diabetes and pregnancy together were still comparatively rare. At King's College Hospital there was a large diabetic department, and it had been possible to collect data on 141 instances between January, 1942, and March, 1949; a further 458 cases were collected by means of a questionary. The results were analysed in relation to the prediabetic and diabetic states. In the former the fœtal mortality greatly exceeded that for normal pregnancies. The incidence of large babies (10 lb. and over) was found to be high in prediabetic pregnancies, with a maximum in the period furthest from the onset of diabetes. Provided there was proper control, the maternal mortality was only slightly influenced by the diabetic state. Morbidity was difficult to evaluate, but during the puerperium a significant number of patients had poor lactation; perhaps this again implicated the pituitary gland, dysfunction of which, it had been suggested, might account for the original diabetes and the overweight babies.

Even in well-controlled diabetics the fœtal mortality was still appallingly high, and it did not appear to vary if there were short periods of ketosis or hypoglycæmia during the pregnancy. A high fœtal loss was associated with hydramnios, which was a common complication. The babies from cases of hydramnios were significantly larger than those from cases without it; since the size of the placenta was directly related to the size of the baby, it would seem that some factor was acting through the placenta and causing not only the hydramnios, excessively large baby, and high fœtal loss, but also usually the toxæmia of pregnancy. Toxæmia was far more common in diabetic pregnancies. Fœtal loss from this cause was great if the pregnancy was allowed to continue beyond 37 weeks. Possibly a common factor caused toxæmia and intra-uterine fœtal death. The incidence of intra-uterine death rose gradually in the last 6 weeks of pregnancy, but the neonatal death-rate fell slowly towards term. Nevertheless, fœtal loss from cæsarean section did not differ greatly whether the operation was done before or after the 37th week. Results showed that cæsarean section at 36 weeks was associated with only half the fœtal mortality from spontaneous or induced labour. Many neonatal deaths took place in the first 48 hours after delivery; and here once again a diabetic factor was evidently operating. There was, however, no good evidence that hypoglycæmia was a cause of death.

Dr. G. **Douglas Matthew** observed that in his experience stilbœstrol therapy had not affected the onset of pre-eclampsia. Intra-uterine death might be caused by a period in which the diabetes was uncontrolled.

Dr. **Petersen** (Copenhagen) pointed out that the younger the age of onset of diabetes in the mother, the higher was the fœtal mortality. Good results were obtained if the baby was starved for the first 48 hours.

Mr. H. H. **Fouracre Barns** suggested that early termination of pregnancy did not affect the eventual outcome for the baby, but merely transferred deaths from one column to another. Stilbœstrol, acting as a depressant of the anterior pituitary, did increase the salvage of infants when the pregnancy was allowed to go to term.

Prof. F. J. **Browne** did not believe that hypoglycæmia was the cause of neonatal death, and directed attention to the hypertrophy of the heart and adrenal cortex in these babies.

HERNIA OF THE POUCH OF DOUGLAS

Mr. C. D. **Read** said that enterocele had been recognised for generations, but its importance had on the whole been sadly neglected. For the last hundred years anatomists had realised the importance of the rectogenital space. At birth the pouch often extended to the perineal body and was obliterated later by fusion of the peritoneal walls of the sac. In adults the depth of the pouch varied greatly; the analogy of the preformed sac in hernias generally was obvious, and this might sometimes be a factor. Pulsion enteroceles might result from increased intra-abdominal tension associated with adiposity or large tumours; they were also found in slim, asthenic patients. Ventrifixation of the uterus might concentrate the downward thrust along the inclined plane formed by the posterior wall of the uterus, and so predispose to enterocele formation. Traction enteroceles were formed as a result of uterovaginal prolapse; and rectal prolapse was often associated with enterocele formation. The cure of enteroceles depended on excision and closure of the orifice of the sac, and adequate support from below by a sling constructed from the uterosacral ligaments. Simple inversion of the sac resulted in a peritoneal cyst. Enteroceles associated with uterovaginal prolapse were operated on by the vaginal route, either by the Manchester type of operation or by vaginal hysterectomy with repair. In patients on whom an otherwise successful operation for uterovaginal prolapse had previously been done, the operation could be performed by the abdominal or by a combined abdominovaginal approach. Mr. Read urged adequate repair of enterocele, and a search for its presence in all cases of uterovaginal prolapse.

Mr. A. A. Gemmell said that in his experience enterocele was rare; the condition usually arose after operation for uterovaginal prolapse, and was due to subsequent vaginal delivery, the menopause, or an inadequate primary operation. It could be prevented by adequate posterior repair at the first operation. He thought that the uterosacral ligaments might be difficult to identify from below.

Mr. A. C. Palmer considered enterocele to be a standard finding in cases of procidentia. It was repaired by reconstitution of the pelvic floor, removal of the uterus being an essential preliminary.

Mr. C. M. Gwillim drew attention to the high rectocele, which was not sufficiently recognised. An enterocele could be recognised only by inserting a finger into the pouch; and it was best repaired after vaginal hysterectomy.

Mr. Victor Bonney objected to the term "hernia of the pouch of Douglas." Twenty-five years ago he had pointed out that the pouch was a natural hernial sac. Pulsion was of use in defæcation; and obliteration of the sac—e.g., after Wertheim's operation—was followed by annoying constipation. He preferred the term "prolapse of the posterior vaginal vault." The uterosacral ligaments were *not* a separate entity but the posterior edge of the fan-shaped cardinal ligament.

Dr. Joe Meigs (Massachusetts) said there was no hernia of the pouch of Douglas unless it prolapsed through the anus.

Mr. V. B. Green-Armytage favoured the old operation of vaginopexy.

Mr. F. E. Stabler pointed out that the inferior surface of the peritoneum could be recognised by the presence of extraperitoneal fat.

Mr. Read, in reply, said that constipation after Wertheim's operation was probably due to destruction of nervous pathways rather than to obliteration of the pouch of Douglas. He likened the operation of vaginopexy for enterocele to ventrifixation for uterovaginal prolapse.

CARCINOMA OF THE UTERUS

This meeting, under the chairmanship of Prof. O'Donel T. D. Browne, opened with an account by Dr. J. Ernest Ayre (Montreal) of the diagnosis of uterine cancer by cytology. As long ago as A.D. 131 Galen had said that if cancer was to be cured diagnosis must be early, but in almost 2000 years since then no method of securing early diagnosis had been perfected. For the last 75 years pathologists had tried to foretell the behaviour of cancer by biopsy, but unfortunately the test was seldom made early enough for the end-result to be controlled. In 1928 Papanicolaou reported cancer cells in the vaginal secretions of women with carcinoma of the cervix. This had been confirmed in Dr. Ayre's own laboratory, where it was found that the test was even more reliable when the secretions were aspirated directly from the external os rather than from the pouch of Douglas; a scraping of the squamocolumnar junction proved very reliable in the search for malignant cells in clinically undiagnosable carcinoma of the cervix. Between June, 1945, and February, 1949, 3605 cases of uterine carcinoma had been studied in his laboratory; among these there had been 15 false negative and 16 false positive results.

Prof. G. I. Strachan, who spoke on precancerous changes in the cervix, drew attention to the value of the Hinselmann colposcope in detecting leucoplakia of the cervix.

Dr. Alfred Glucksmann described the method developed by him, in conjunction with Dr. F. G. Spear, for detecting radioresistant tumours; and he showed that the results obtained from the radiotherapeutic treatment of carcinomas of the cervix were better in the differentiating type of tumour than in the anaplastic type in the same stage. To assess the radiosensitivity of tumours, the cell-count method had been introduced. For this it was necessary, during a course of radiotherapy, to obtain repeated biopsies of the growing edge of the tumour, which contained young foci. In 97% of 187 cases that had now passed the five-year mark the histo- [illegible] greed with the final clinical result. It [illegible] that this method could be relied on to show whether or not the tumour could be cured by radiotherapy; and if the tumour was not responding favourably to radiotherapy, this would be an indication for surgery. Encouraging preliminary results had been obtained in a study on these lines which he was carrying out with Mr. Stanley Way.

Dr. Alexander Brunschwig (New York) described two types of operation for uncontrolled uterine cancer: (1) complete excision of the vagina, uterus, bladder, and pelvic lymph-nodes with bilateral implantation of the ureters into the pelvic colon; and (2) complete exenteration—that is, excision of the bladder, vagina, pelvic colon, and the entire perineum, and implantation of both ureters into the pelvic colon above an end-colostomy.

Dr. Joe V. Meigs (Boston, Mass.) said that because some patients with early carcinoma of the cervix did not respond well to irradiation he had begun to employ surgery, and in 1944 he presented five reasons for preferring surgery to irradiation:

(1) If the cervix was removed there was no chance of the tumour recurring in it;

(2) if the cervix was removed no cervical cancer could regrow in it;

(3) certain cancers of the cervix were radioresistant;

(4) there would be less damage to the bowel if surgery was undertaken; and

(5) from the work of Bonney and Taussig it was obvious that patients with lymph-node metastases could sometimes be cured by surgery, but it did not seem possible to cure these cases with radiotherapy.

In early selected cases surgery should be the treatment of choice, and Dr. Meigs described four different types of procedure that could be carried out: (*a*) radical panhysterectomy with pelvic-node dissection; (*b*) pelvic-node dissection only, as described by the late F. J. Taussig, where the cervical tumour was adequately controlled with radiotherapy; (*c*) extraperitoneal lymph-node dissection as described by Dr. Ira T. Nathanson; and finally (*d*) pelvic exenteration, as performed by Dr. Brunschwig. A number of patients with advanced tumours had no lymph-node involvement, and these were suitable subjects for pelvic exenteration. This type of surgery demanded great skill; not more than one in twenty surgeons was competent for work of this sort.

Mr. Victor Bonney recalled that for forty years he had championed the surgical treatment of carcinoma of e cervix. With regard to Dr. Brunschwig's account, felt that the removal of the bladder along with the erus was better than the old operation ; the removal the rectum as well was largely experimental, but is modification should be tried and judged on its sults.

Prof. Subodh Mitra (Calcutta) described his well-nown technique of radical vaginal hysterectomy. e agreed that this did not deal with the lymph-nodes d added that he had recently combined this operation ith an abdominal approach in order to remove the odes.

Prof. J. Heyman (Stockholm) expressed disbelief at there was any such thing as a radioresistant tumour. e was perfectly satisfied with the 42% absolute five-ear cure-rate he had achieved in the Radiumhemmet.

Dr. Malcolm Donaldson believed that the cell-count chnique described by Dr. Glucksmann was accurate ; e suggested that for the investigation of this and other roblems a clinical cancer research committee should e set up without delay by the Royal College of bstetricians and Gynæcologists.

Mr. Stanley Way undertook to show Professor Ieyman at least one radioresistant tumour at Newcastle. f a 42% cure-rate was satisfactory, what incentive was here to treat the remaining 58%, and what hope could hese patients ever expect ? He believed that the most uitable case for Wertheim's hysterectomy was also the nost suitable for treatment with radium. The lymph-odes were involved in nearly 70% of the radio-ncurable cases on which he had operated, but in less han 10% of the radio-curable group. He believed that adium would cure about 25% of cases ; and that another 0% could be saved by surgery and another 5% by the nassive pelvic exenteration described by Dr. Brunschwig. For the remainder there did not seem to be much hope t present. He supported Dr. Donaldson's plea for a ommittee to guide clinical cancer research because ardly anything was known about the natural history of carcinoma of the cervix.

Dr. Ninian Falkiner was convinced that radio-esistant tumours did exist ; and he showed microscopic pecimens from a case on which he had operated after full course of radiotherapy. These specimens showed ctive tumour in all parts, and he reasoned that uch a method of preserving specimens as he described hould be included in the cancer research programme.

Dr. Crosby (Montreal) believed that a further 6% of his early cases could have been saved by surgical intervention after radiotherapy.

MATERNAL MORTALITY

At this meeting the chair was taken by Dr. E. Chalmers Fahmy. The subject was introduced by Sir William Gilliatt, who referred to the Minister of Health's remarks on the recent improvement in mortality figures and deplored the Minister's use of these figures for political purposes. Sir William attributed the lowered mortality to the introduction of chemotherapy and improved technique in preventing sepsis ; but he admitted that with post-abortion sepsis the improvement was not so satisfactory, and he appealed for better facilities for dealing with this sort of case. The price of freedom from sepsis was eternal vigilance. The reduction in deaths from toxæmia was largely due to improved antenatal work ; and those who undertook antenatal care should also be responsible for the delivery of their patients. Routine weighing was as important as routine measurement of the blood-pressure ; and any increase of weight beyond 3 lb. in a week should be regarded as pathological. Hæmorrhage was still the greatest direct or indirect cause of maternal death, and it contributed very largely to both sepsis and embolism. The treatment of placenta prævia was nowadays more conservative ; active intervention should consist only of artificial rupture of the membranes and the use of a binder, or cæsarean section ; he personally favoured the lower-segment operation. He supported the use of oxytocic drugs before the uterus was empty in the third stage. The prevention of pulmonary embolism was most important, and he recommended exercises within twenty-four hours of delivery, but, in order to prevent prolapse, he preferred to keep patients in bed for fourteen days. The anæsthetic risks were enhanced in midwifery by the risk of inhaling vomit ; this was because opportunities to prepare the patient for an anæsthetic were often inadequate, and he regarded the provision of a specialist anæsthetist who could give his whole time to obstetrical work as a very necessary improvement in maternity departments.

Prof. Hilda Lloyd urged that normal confinements should be conducted by midwives, whose training fitted them better for the task than, for example, newly qualified doctors with no resident hospital experience in obstetrics. With regard to figures for Birmingham, she spoke of the immense value of the flying-squad in reducing deaths from hæmorrhage.

Dr. Percy Stocks, as a statistician, discussed the remarkable fall in both the obstetrical and the non-obstetrical deaths from sepsis in the past twenty years ; the fall had begun even before the era of the sulphonamides, so clearly some further factor was at work. He reckoned that about three-fifths of the fall in maternal mortality from sepsis was due to chemotherapy, and the other two-fifths to improved technique.

Prof. Dugald Baird appealed for closer coöperation between clinician and statistician. He spoke of the improvements in north-eastern Scotland ; but he was still not satisfied with the figures for shock, and he thought that a maternal mortality of 0·5 per 1000 was well within our compass within the next few years.

Sir Eardley Holland referred to his work for the Ministry of Health in investigating maternal deaths at the beginning of the late war. The most important cause of death was shock, with or without hæmorrhage ; and at least half the deaths could be prevented by applying quite ordinary standards of midwifery. He regarded the contribution of the Ministry of Health as insignificant. He recommended that maternal-mortality committees be set up, as in the U.S.A., and suggested that the Ministry should cooperate in this.

Mr. G. W. Theobald spoke of the influence of factors outside the maternity service and paid particular tribute to members of the public who acted as blood-donors. He thought that the fall in the death-rate from toxæmia was due to diet more than anything else. He referred to the abuses which he considered inherent in Ministry regulations which encouraged general practitioners to undertake midwifery that would otherwise have been left in the hands of competent midwives ; it would be a sorry day when we allowed anything to lower the status of the midwife, the backbone of the country's obstetrical services.

Dr. H. R. McLennan also deplored the inducement which the Ministry of Health gave to inexperienced general practitioners to undertake obstetrical work for which they were neither trained nor suited.

In closing the congress the President said that there had been over seven hundred registrations ; and he welcomed a hundred visitors from overseas.

Special Articles

OSLER CENTENARY CELEBRATION AT OXFORD

FROM A CORRESPONDENT

If an attempt were made to celebrate the anniversaries of all Oxford's famous men, the university would be in continuous fête. Yet it was right that the centenary of Sir William Osler's birth on July 12 should be commemorated, not only to keep his memory green but because no-one had a greater enthusiasm for commemorative feast days than Osler.

It was very different weather from that summer in 1905 when Dr. and Mrs. Osler and Revere first arrived, and scandalised north Oxford by lighting fires after the spring-cleaning. As we walked up Norham Gardens, past no. 7 where they first stayed, the grass of the parks was yellow and parched and the red geraniums in the lodge at the corner looked almost cool. The "Open Arms," 13, Norham Gardens, was left by Sir William to the governing body of Christ Church as a residence for subsequent regius professors; but none of them has lived in it, and since Lady Osler's death it has been used as a residential hostel for the students of St. Anne's. It seems a pity that it is not associated with the medical school, even though it may be too large for a modern regius; for there is much of Osler about the house—book-cases everywhere; three empty panels over the library mantelpiece where Linacre, Harvey, and Sydenham looked down on countless students admiring the books laid out to fire their enthusiasm for the history of medicine; the rather sombre consulting-room where Dr. Francis and Mr. Hill worked for nine years completing the *Bibliotheca Osleriana* before that wonderful collection, much of which was kept upstairs in the white-painted study which has still Osler's built-in desk with its red baize cover, went to McGill; the beautiful drawing-room with its sliding doors and the maple fireplace brought from Lady Osler's old home; the terrace overlooking the garden that Lady Osler loved. But it is nearly ten o'clock and instinctively one turns into Woodstock Road to reach the Radcliffe Infirmary; it has changed greatly and architecturally not for the better; the outpatient block still stands as it did, with the laboratories which Osler never failed to visit and which he helped Dreyer and Gibson to design; but the kitchens where he would taste the puddings and the children's wards where he was so welcome have altered beyond recognition. However by the Observatory stands an 18th-century house, once the home of the observer and now Osler House, where the clinical students have their common-rooms and library and Osler's portrait welcomes them in the hall; he would approve of Osler House.

It was natural to go to the Bodleian to look at Osler's clock and the Turbutt Shakespeare he helped the university to regain; then up Headington Hill to the Manor House estate where the new hospital will be built, probably in the time of the thirtieth regius, to judge from present activities; but this is a perlustration of the past, and though the Radcliffe Infirmary only purchased the estate in the last year of Osler's life, yet the Osler Pavilion, of which Lady Osler laid the foundation-stone in 1925, stands as a memorial to Sir William's work in the field of tuberculosis, and, for those who can read the hieroglyphics on its walls, as a reminder of the harm and delays that may come when medicine and local politics get mixed.

From Headington, we took the wandering country lanes along the valley of the Thame, and soon were passing the watercress beds in the waters of the spring from which Ewelme takes its name. Since 1617, the regius professor of medicine has been master of the almshouse, founded two centuries earlier by Alice, Duchess of Suffolk, and both Sir William and Lady Osler took a great interest both in the thirteen beadsmen and the village itself. The children were running out of Dame Alice's school—the only elementary school held in a 15th-century building—as we came along the lower road and passing the 18th-century parsonage reached the church, to find it open to the sky and heavy with the smell of cuprinol; death-watch beetle was found in its fine roof some twelve years ago and the work of preservation was delayed by the war. In spite of the scaffolding and the dust-sheets over the screen, it was impressive in the simplicity of the stonework and the magnificence of the font cover and the great tombs. From the west door a flight of well-worn steps leads to the quadrangle of the almshouse with its master's lodging, where Osler used to stay for a little peace and to be with his old men; it was cool and restful on this hot July day and it was not hard to believe that the thirteen almsmen found themselves in sympathy with the philosophy o *their master.*

The official ceremonies began in the afternoon and had been arranged by the Oxford division of the British Medical Association, which was very right, for Osler was a great supporter of medical meetings, and it was at the annual meeting of the association held in Oxford in 190 that he decided that he would accept the regius chai if invited. The chairman of the division, Dr. W. F Hudson, and the organising committee had shown brilliant insight in the selection of the speakers, for in their different ways they characterised the two major aspects of the Osler tradition—the textbook and the man. Sir Henry Cohen spoke on "subacute bacteria endocarditis: a study in the changing pattern of disease induced by modern therapy." After recounting the part which Osler played in the recognition of bacterial endocarditis, likening him to an English Morgagni, Sir Henry delivered a masterly clinical lecture on the disease calling attention to little-known early signs such as superficial thrombophlebitis or the occurrence of amenorrhœa in the mitral stenotic with menorrhagia; but the major portion of his address dealt with the effect of penicillin therapy, which he felt should be used more generously than is usually recommended; and he gave a warning against the use of a "penicillin umbrella" to ward off minor infections. From his carefully studied series of cases it was possible to say that with adequate treatment at least 50% of patients are "cured," bu he emphasised the complications that might become apparent—exacerbations of rheumatic heart disease vascular lesions often the residua of mycotic aneurysms and congestive cardiac failure which usually arose in those patients who had shown signs of failure before treatment had been instituted. Sir Henry concluded by pointing out that by prolonging life one was increasing the hazards of the disease and he spoke of the pleasure that Osler would feel in knowing that a practical and effective therapeutic agent, in a disease which in his day was invariably fatal, had been evolved in Oxford.

Lieut.-General Sir William MacArthur selected for his theme: "Of the smallpox: a review in the Osler tradition." Those who have heard Sir William lectur can imagine something of the artistry with which he wove his tale. Starting with the two occasions on which he met Osler, Sir William spoke of his indebtedness to the textbook: by quoting Rhazes and Sydenham he had successfully impressed examiners with an erudition which was really Osler's; by using the textbook to convince his commanding officer that chickenpox is rarely fatal in adults he had been able to avert a smallpox epidemic in an island garrison; and by finding that Osler had already made all the observations which he thought were original he had been saved from writing some papers. From there Sir William traced the history of smallpox in Great Britain, proving by a lucid etymological argument, which involved quotations from the *Annals of the Four Masters* and other early Gaelic literature, that the medieval epidemics of leprosy were in reality smallpox: he spoke of the origin of the epidemics of syphilis in the Renaissance; of the incidence of smallpox in the days of the Stuarts; of how the wicked Barbara Villiers [illegible] in favour because she had had the cowpox; [illegible] f "La Belle Stuart"; and of the [illegible] daughter. Then he talked of the other great mortality of the 17th century—the plague; of the children playing at plague burials in the streets, and how he had found the explanation for an unusual case in the writings of Ambroise Paré. And so the tale owed on, effortless and natural, without a note, without hint of pompous erudition, just as the other Sir William, nother Celt, used to talk in his library, of which Sir lifford Allbutt wrote: "to get at the flow of his nowledge and experience he had to be aroused by some opic in which he was specially interested; then in the nimation of talk he would bring forth things both new nd old."

In the gardens of the Radcliffe Observatory, recently aved from hut disfigurement, tea was served and the Regius Professor had a display of fine photographs of Ewelme in Osler House to remind us of the mastership nd of the "Friends of Ewelme Church" who are iving and collecting donations for the restoration und.

Recently the Radcliffe Science Library have been organising exhibitions in the history of science, and it was natural that the committee should select "Sir William Osler" for the present exhibition, which remains on view until December. On the walls of the staircase are panels with photographs and legends illustrating Osler's life and works in all its facets; and portraits of his *friends*—*Sir Thomas* Browne, Locke, SS Cosmas and Damian, and the original Acland triptych of Linacre, Harvey, and Sydenham. In the show cases are some of Osler's books, from the *early* works on diatoms to the *Evolution of Modern Medicine*; Egerton Y. Davis is there too, though he wears a figleaf; then the *Bibliotheca* is displayed with some of the manuscripts Osler gave to Bodley and a case is devoted to Osleriana.

The commemorative dinner, which over 250 attended, was at Christ Church, where Osler was a student—the equivalent of a fellow in other colleges—and found such pleasure in the common-room life, even though he was always forgetting that he might introduce only two guests. Before we entered the hall we went into the library to look at Robert Burton's library, gathered together by Osler, and forming a frame for his portrait—a very Oslerian touch which has been copied by other libraries. After the loyal toast Dr. Hudson read a telegram of greeting from the Osler Club of London, and then Prof. J. A. Ryle proposed The Art and Science of Medicine, speaking of the part which Osler had played: this was followed by Sir Hugh Cairns who proposed the toast of Sir William Osler and gave a delightful sketch of Osler as seen through the eyes of a young Australian Rhodes scholar and a disciple of Harvey Cushing. Prof. A. D. Gardner, the regius professor, proposed The Guests: and they were a notable gathering—the Mayor, the pro-Vice-chancellor, the President of Trinity; Dr. Peyton Rous; Captain Bachulus representing the American Embassy; Prof. Arthur Ellis, until recently regius professor; R. H. Dundas and Eric Gray of Christ Church and Prof. Sidgwick, an honorary student; Sir Lionel Whitby, regius professor of physic at Cambridge; Sir Arthur MacNalty; and Professor Bucy of Chicago. Lord Nuffield could not come, but Sir Hugh Cairns recalled that Osler's car was one of the last that Lord Nuffield had repaired with his own hands. In the hall were many who had known Osler well, such as Dr. A. G. Reade, who was a house-officer at the Radcliffe in 1907, and Dr. William Stobie, who was closely associated with Osler in the early and highly successful Oxfordshire tuberculosis dispensary scheme before it was stopped by the dead hand of bureaucracy; but many must have felt sad that Dr. A. G. Gibson, who knew Osler more intimately than anyone during his time at Oxford, could not be there to speak of the man he knew and loved. Dr. Peyton Rous replied for the guests and spoke as a former intern at Johns Hopkins.

As we descended the stairs from the hall, enjoying the fine stone vaulting, and then gathered in groups in Tom Quad to gaze at the fairy-like silhouette which long summer evenings give to the Oxford skyline, there must have been many who resolved to look again at the *Text Book*, *An Alabama Student*, or the *Evolution of Modern Medicine*, or perhaps to re-read Harvey Cushing's *Life*. So was Osler's birthday observed at Oxford and endorses his words: "In the continual remembrance of a glorious past, individuals and nations find their noblest inspiration."

In England Now

A Running Commentary by Peripatetic Correspondents

WHEN you drive through a village and see an ox looking out of a first-floor window, you may know you have really left England. When you meet other oxen wearing long fringes over their eyes and drawing wagons, you may be sure you have come south. And when the background composes itself of vineyards, extinct volcanoes, and monuments to Vercingetorix, you can be certain you have reached the Auvergne.

Do not suppose, however, that our life is barbaric: beside my bed is a choice of four bells for summoning four separate officials, including the cellarer. Moreover at every town our medical delegation is received with a ceremony that would be embarrassing were it not so charming. A few flags; a great many introductions: M. le Maire; and a simple banquet lasting two hours. In future I shall take care to wear my hat when leaving railway stations, in case the police force is standing at the salute when, amid photographers, we emerge. But our hosts have one gesture at least that leaves me incapable; so it is just as well that I don't have to make the speeches. It doesn't matter at the theatre, where one need do no more than stand respectfully in one's box; but yesterday, when we stopped in a little spa to take tea, I was badly shaken when the four musicians struck up "God Save the King," followed by the Marseillaise.

It is true that understanding is difficult when one's neighbour dilates on the amenities of English resorts of which one has never heard, such as Isborn: and I get absurdly conflicting answers to simple natural-history questions, such as whether there are still beavers in France. But none of our party will ever doubt again the reality and the value of an Entente that has become so much more than just cordial.

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In those long minutes which I spend waiting for TOL, TRU, or O to answer in the evening, my eyes idly scan the information Messrs. Churchill provide in the two volumes of the *Medical Directory*. By the time that I have learnt the number of children's hospitals there are in Warwickshire, or the number of knights which the profession claims, I have forgotten the telephone number a harassed operator demands. But the time though wasted is not ill-spent. For the "local lists" stimulate memories of tiny villages which I have passed through or mushroom towns I hope I may hereafter avoid. They recall moor or hill, fen and lock over which I have wandered or sailed blissfully free of all Mr. Edison's contraptions.

If I wish for real escape it is to the counties of Sutherland and Ross that I go: if I wish for the freedom of imagination I can look them up in the *Medical Directory*. It at once strikes me that these areas are apparently under-inhabited and over-doctored. I can imagine why there are four doctors at Strathpeffer—it is or was a spa, though otherwise tiny enough—but I cannot think that Gairloch requires a similar number and I don't count those "*not in practice*." Some more tiny spots boast almost as many, and the reason is that these lists include, I am sure, the recently qualified Scot before he leaves these isles to explore the Empire.

If you go to these wild districts in the summer—some only to be approached by boat or antediluvian mail bus—you will find few young men or women. The men are the backbone of the Navy or the fishing fleet, and the older children are at the secondary school for the district, sixty miles away, boarding with distant relations. An astonishing number are at the university, or in the summer vacation adding to their income by many methods. If your sons or daughters (and there are many women in these lists) wish to practise in these parts they must learn more than is tested by the universities or Scottish colleges. They must be prepared to do rounds on a motor-cycle (despite recent pronouncements of the Minister) and even ride on horseback to lonely farms for confinements. They must not only be prepared to use a motor-boat but know something of the dangers of the sea lochs. They must care and continue to care for cases which cannot be taken to hospital by one ambulance only but whose transport may be a matter of rowing-boat, steamer, and motor ambulance. And they must know Gaelic. The number of people in Scotland who can talk no English is now very small. But when it comes to ministering to children in pain, or to the old in distress, it is in Gaelic that the sufferers will complain, and in Gaelic that the soothing words are spoken.

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Well, here I was on a stretcher trying to keep calm, for it looked as though the A. and the S. aforesaid were about to carry me to the theatre. Behave as for a first night: You're not enjoying it. No, neither are they. It's 4 A.M. Remember you trust them. Your feet are at an angle. Your head's in the surgeon's belly. It's him they ought to worry about; he must have steady hands. *Aren't there any porters in this place? No,* it's a spivvy nursing-home. Here's matron in a red belt. Couldn't I walk? I don't like this. I like the surgeon's red braces. Funny my life is in his hands—and in his brain. Why have I been reading Jean-Paul Satre? Never read Satre before operation. Step by step. Here we are. How hard the table is. The anæsthetist's gown is only tied in one place. "Lift up your head," he says. If only I'd had time to wash my hair. The surgeon is washing his hands. "Now for a nice sleep," the anæsthetist says in that Teddy Bear way that makes them famous. How my tummy hurts. Hurry up, do. I know, I've had it before. "Just a prick!" How bright these lights are. I don't even have to count. *The surgeon looks over his shoulder and grins. He's* got his cap thing on. I remember that he paints pictures and is mad on boats. I remember that they are both friends as well as doctors. The anæsthetist smiles and holds my hand. How does he do it? There's a bottle thing between us. Never mind, I haven't made a fuss. I hope I haven't got to do anything any more. I can sleep. It's up to them. . . .

And, so far as I am concerned, back to bed.

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The Minister himself has repeatedly stated his desire to delegate as fully as possible powers to regional boards and boards of governors. Your proposal, that both these bodies should have power to spend their incom according to their best judgment, is the only way tha the freedom of hospitals to develop can be preserve I would add two footnotes to the proposals, which consider essential if the full value for locally determine expenditure is to be obtained for patients.

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SIR,—Thank you for your leading article of July 9. I am afraid that what you state is only too true.

The original intention was for the regional boards to be responsible for policy and planning of the hospitals within the region, and nothing else. What have they done in this respect? Surely they should now be taking steps to see whether the hospitals are large enough in structure and staff, and properly equipped to deal with patients. Instead they ask the management committees to inform them what extensions they consider essential in the next financial year. Where is the policy? Where is the planning?

The regional board should be planning for the hospitals in their region for ten years ahead. The plans should be prepared now and put into effect year by year so that at the end of the ten years the plans and policy for the period would be effected as a whole. Instead they appoint finance officers, supplies officers, and many others, who naturally wish to show that they are trying conscientiously to earn their salary: and thus they come to interfere with the management committees who have their own finance officer and supplies officer.

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Controlling expenditure by budgets and making each hospital keep within its budget, after it has been slashed by the regional boards and the accountant-general and his colleagues, is just a farce. How does any hospital know what kind of treatment will be required for its patients over a given period? Each hospital in preparing its budget would work largely on its expenditure for the previous year, but the weather, the various complaints from which the patients suffer, and other unforeseen circumstances may alter the whole financial estimate. If every contingency were allowed for, the budget would be at least 20% more than was spent during the previous year. This would allow the accountant-general to slash the budget by 10% and thus help him to feel he had done his job, leaving 10% for the hospital to have in hand for unforeseen circumstances. Is this what the Ministry wishes to be done?

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LIVER EXTRACTS IN PERNICIOUS ANÆMIA

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It is with reference to the potency of the liver extracts manufactured by our British chemists that I think it worth while to submit my personal experience. I do so as a physician who has the unsolicited advantage of suffering from pernicious anæmia. I have tested on myself the liver extracts made by four of our best known manufacturing chemists and in each instance I have found, over the past few years, a considerable variation in their potency based on such irrefutable evidence as the alleviation of symptoms and the maintenance of fitness for activity and work. It was therefore something of a shock to learn, from so high an authority as Dr. Wilkinson, that this variation in potency is due to the fact that our manufacturers, for a number of years, by the direction of the Ministry of Food, have been unable to obtain an adequate allocation of healthy and fresh calf or cow liver, and that they have had to use "so-called pharmaceutical livers—*i.e.*, livers unfit for human consumption which had been rejected in the abattoirs on account of disease."

For myself, I have been fortunate to obtain as a gift from relatives in the U.S.A. a supply of liver extract made by a leading American firm, after I had failed to purchase it in London. The results have left no doubt as to the superior potency of the American product. I wrote recently to the Ministry of Health drawing their attention to these facts, and asking, since this liver extract was not procurable in England, if I could be granted a permit to purchase the small quantity I required directly from America until fresh and healthy liver was made available to our own manufacturers. I will quote the main relevant points in the Ministry's reply.

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In your issue of July 2 you publish a letter from Sir William Dalrymple-Champneys, of the Ministry of

Health. This attempts to refute clinical experience that British liver extracts made from pharmaceutical livers are inferior to those made from "fresh edible livers." He says: "Though no detailed evidence was offered *in support of this view, it was nevertheless decided* to inquire into the matter. . . . In the discussions which have been held here no evidence could be discovered to substantiate the claim that better liver extracts could be made by using fresh, edible livers than by using so-called 'pharmaceutical livers.'" This is a remarkable statement. As points worth noting he defines "pharmaceutical livers" as "a trade term to cover livers which are tough or not sufficiently fresh in appearance to attract the housewife. It does not include tuberculous livers, or those with abscesses or cysts, or other obvious disease . . ."; adding, with a touch of unconscious humour ". . . and such livers are not used for the manufacture of liver extract." He assures us that "in any case the production processes provide effective sterilisation." This is a consummation devoutly to be wished! As to his remarks on the variation in potency, I can only again stress that clinical experience is the only reliable test, and it is by this criterion that our British products have shown in recent years their relative inefficiency.

In face of the clinical evidence, it is regrettable that the material necessary for producing a liver extract of reliable potency is not made available to our British chemists, or, if this cannot be done, that permission to purchase the present more reliable American products is still being withheld. The amount of dollar exchange involved would be relatively insignificant where the well-being and the lives of our patients are concerned.

Clevedon, Somerset. C. W. EWING.

THE APPEALS

SIR,—Your editorial note to the letter of July 9 under this heading makes sad reading. Surely the editor of a scientific journal should not misquote for the purpose of strengthening an argument; neither the writer of the letter nor anyone else has suggested that existing appointments should be *automatically* confirmed. But what matters chiefly is that you should support the downgrading of hundreds of doctors who for years have worked as specialists to the satisfaction of their patients and colleagues, and complacently suggest they should sell their houses, abandon their friends and patients, and wander the face of the country on a series of interviews in search of fresh fields—for that is what you are propounding.

Before and since the coming of the Act there has been constant mention of the shortage of specialists, and now you approve their further curtailment. In response to any outside criticism you would doubtless stoutly defend the doctors of Britain as amongst the best in the world; could you then, Sir, also defend your opinion that very large numbers, and apparently in some areas a majority, of those previously known and practising as specialists are not fit to retain their appointments?

Finally, it is hardly honest to argue that a S.H.M.O.—a man whose title shows that he has already been assessed as not fit to be a consultant—should, in competition for a consultant post, "most certainly be under no disability compared with a trainee specialist."

The patient comes first, and has always done so; but this does not mean that he only is to be considered. The secretary of the B.M.A. recently read a paper on the relationship of happiness to health. You, Sir, should study it; it cannot be applied to the patient alone. One had hoped, with slowly diminishing faith, that an efficient (which must mean also a happy) service could be built up out of the Act. To uproot large numbers of specialists from localities in which they have serve faithfully for years—you imply this is the corollary the policy you advocate—in pursuit of some chair-born fetish of "tidiness" will certainly not make for a happ profession. The scientific side of your journal magnificent. One could wish that the non-scientifi was unbiased.

Royal West Sussex Hospital,
Chichester.

C. J. HARWOOD-LITTLE.

*** We have never advocated that specialists shoul be required to join in a kind of general post in order be upgraded. On the contrary, on June 4 we wrot "What is required is a mechanism whereby the status men in all but the most senior grade can be reviewed recognised intervals, *even though they seek no chang* of post or place." We still think that this should an can be assured. Even when such a procedure is opera tive, there will still be men in the S.H.M.O. class who wi apply for posts that attract them elsewhere, and w believe that, as presumably many of them are no classified as S.H.M.O. while they acquire greater experienc and more mature judgment, their future application f senior posts should be given unbiased consideratio The post should go to the most suitable candida irrespective of his previous grading.—ED. L.

MEDICAL RESEARCH COUNCIL OF *IRELAN*

SIR,—In your note on the annual report of the Medica Research Council of Ireland (July 2, p. 26) the followin sentence appears: "*Four or five tuberculous* sinuse healed satisfactorily after short treatment with B.53. It might be understood from this statement that the was some uncertainty about the number of sinuse treated. The sentence in the original report shoul have read: "Four of five tuberculous sinuses . . The succeeding sentence, however, removes all ambiguit It reads: "The fifth sinus had dried and was progressi favourably at the latest report."

VINCENT C. BARRY
M. L. CONALTY.

University College, Dublin.

THYROTOXIC EXOPHTHALMOS WITH MYOPATHY

SIR,—Dr. Strong's article of June 4 prompts me describe a case *in some ways closely resembling the o* he reports.

A man, aged 62, was admitted to hospital complainin of attacks of hoarseness and dysphagia at intervals for abou five years. For the last ten weeks the difficulty in swallowing and the hoarseness had persisted. The patient also described a prominence of his left eye, becoming progressively worse during the past six years, together with failing vision i that eye. His general health was then fairly good althoug he had lately been losing weight. He had had genera lassitude for the past twenty years, and about twenty year ago a diagnosis of thyrotoxicosis was made by hi private doctor, although the evidence upon which thi diagnosis was made is not known.

On examination there was prominence of both eyes, bu much more of the left. There was moderate œdema of th upper lid of the left eye. The pupils reacted well to light bu the left optic disc was very pale. The thyroid gland wa not palpable, and his pulse-rate was about 80 per min. and regular. The patient weighed some $8^1/_2$ stone. Clinicall he was not suffering from thyrotoxicosis. Examination of th central nervous system was negative, as also was examinatio of the abdomen, heart, and lungs. His blood-pressure wa 150/100 mm. Hg. Laryngoscopy showed paralysis of the lef vocal cord, *which was fixed near to the midline.*

Investigations.—Basal metabolic rate: + 17%. X-ray examination of chest: enlarged hilar glands, but otherwise normal. Cerebrospinal fluid (C.S.F.): normal. X-ray examination of skull: negative. Kahn test in blood and C.S.F.: negative. Electrocardiogram: normal. Blood-count: Hb 84%; red cells 4,220,000 per c.mm.; colour-index 1·0; mean orpuscular volume 97 cμ; mean corpuscular hæmoglobin oncentration 30%: white cells 7500 per c.mm. (neutrophils 5%, lymphocytes 18·5, monocytes 6·5%).

It is considered that this case was one of thyrotropic xophthalmos with chronic myopathy. The myopathy nd exophthalmos seemed to have developed in parallel. he relapsing nature of the myopathy is of interest, and oes seem to support its thyrotropic ætiology—associated ossibly with variations in the rate of release of hyroid-stimulating hormone.

I wish to thank Dr. R. E. Horsfall for permission to report his case.

Victoria Hospital, Blackpool. RAYMOND C. GLEDHILL.

ANTI-HISTAMINE DRUGS IN THE TREATMENT OF BURNS

SIR,—A few days before I read the letter of May 28 from Dr. Shubsachs, my son—13 years old and very fair—swam for some hours in a pond exposed to the sun. When he came home he looked very ill, and he was red all over. He had no fever, but the dermatitis was very severe and painful. I applied 'Inotyol' ointment followed by free dusting with talcum powder. The burning was partly relieved but he was unable to sleep at night. I gave him one capsule of 'Benadryl' (50 mg.): he felt better and was sound asleep in about half an hour. He took three capsules daily, and dusted himself several times a day with talcum powder. On the fourth day he was cured completely and was able to attend school again.

This confirms Dr. Shubsachs's opinion that anti-histamines may have an important rôle in the treatment of burns and even other inflammations of the skin.

DJAMIL FAÏK TUTUNJI
Amman, The Jordan. Under-Secretary of State for Health.

HÆMOLYTIC DISEASE OF THE NEWBORN DUE TO ANTI-A ANTIBODIES

SIR,—In your issue of June 25 Miss Boorman and her colleagues reported two cases of hæmolytic disease of the newborn due to anti-A. They pointed out that the most convincing evidence of the action of anti-A in such cases is the demonstration that A cells, but not O cells, are rapidly destroyed after transfusion. In one of their cases they succeeded in securing evidence of the rapid elimination of A cells, though they could not obtain serial quantitative data. A little while ago we obtained satisfactory estimates of the survival of A and O cells in a similar case, and this may be an opportune moment to record them.

The mother had had one previous pregnancy, resulting in a healthy child (later shown to be group A_1). Her second infant was born two years later. Before its birth the midwife noticed that the liquor amnii was very yellow and at birth the infant's umbilical cord was yellow and the vernix caseosa orange. A sample of blood was obtained from the umbilical vein immediately the child was born, and this had a hæmatocrit of 30% and a hæmoglobin concentration of 10 g. per 100 ml. (These values are only about 60% of the average normal and are far below the normal range.) The serum-bilirubin concentration was 3 mg. per 100 ml.—just above normal limits for cord blood; and a blood film showed a considerable excess of nucleated red cells. The direct Coombs test was weakly positive.

The results of blood-group tests were as follows:

Infant.—A_1 (secretor), MN, CDe/cDE: its serum did not agglutinate A or B cells suspended in saline.

Mother.—O, MN, CDe/CDe; her serum hæmolysed A cells but not B cells; the serum had an iso-agglutinin titre of 1/1000 against A_1 cells and of 1/128 against B cells. The titres were no higher when the cells were suspended in 30% albumin and the serum was diluted in albumin than when the titrations were done in saline. The serum did not agglutinate, or sensitise to an anti-globulin serum, cells of types CDe/cDE or cde/cde.

The bloods of the mother and infant were also tested by Dr. Sylvia Lawler of the M.R.C. Blood Group Research Unit who found that both were P+, S−, Lewis+, and Kell−; the mother was Lutheran-negative and the infant Lutheran-positive, but the mother's serum did not contain anti-Lutheran.

By 16 hours after birth the infant's hæmoglobin concentration had risen to 16·4 g. per 100 ml., doubtless mainly owing to the placental transfer of blood; the serum-bilirubin level was 5·5 mg. per 100 ml. and the reticulocyte-count 8·6%. The infant was transfused via the umbilical vein with about 35 ml. of washed, packed O, N, CDe/CDe cells and 40 ml. of washed, packed A_1, M, cde/cde cells. With very potent anti-Rh and anti-M sera, counts could now be made of the survival of the A_1 and the O cells. Venous samples were taken from scalp veins on succeeding days and the estimates were:

Time after transfusion	Unagglutinated erythrocytes per c.mm. *		Total Hb (g. per 100 ml.)
	O cells (with anti-M)	A cells (with anti-Rh)	
Before	4000	4000	16·4
10 min.	853,000	1,030,000	18·9
1 day	873,000	968,000	19·4
4 days	880,000	545,000	18·4
5 days	932,000	396,000	17·7
6 days	901,000	352,000	17·2
11 days	935,000	216,000	15·5
20 days	765,000	234,000	14·1
47 days	566,000	113,000	12·6

* Each estimate based on a count of approximately 3000 cells.

Thus during the six days after transfusion the concentration of transfused A cells fell to about 35% of the initial value. By contrast, during the same period the count of O cells actually rose slightly, probably because of a readjustment of blood-volume. Evidently the survival of the O cells was normal and that of the A cells grossly reduced. The increased rate of elimination of A cells came to a stop between 6 and 11 days after birth; and by the end of the first week of life the reticulocyte-count had fallen to 1·5%.

The direct Coombs test remained definitely positive for 48 hours after birth, was doubtfully positive 5 days after birth, and thereafter was negative.

The infant's progress was entirely satisfactory.

M.R.C. Blood Transfusion Research Unit, Department of Obstetrics, Postgraduate Medical School of London. P. L. MOLLISON
MARIE CUTBUSH.

EXCHANGE OF DOCTORS WITH THE U.S.A.

SIR,—Before the war there were some schemes in action for the exchange of doctors between hospitals in this country and the U.S.A. There is now a more widespread desire by doctors in this country to visit the U.S.A. This may often be facilitated by arranging for a regular exchange of doctors between medical schools and hospitals in the two countries.

There seems to be some fear that making such an arrangement for an American doctor to work in a hospital here infringes the Acts governing medical practice. This is not the case, for by section 8 of the Medical Practitioners and Pharmacists Act, 1947, Parliament has made provision for the admission to the Medical Register of Commonwealth and foreign practitioners temporarily in the employ of hospitals in this country.

If a hospital is prepared to offer a postgraduate post to a qualified practitioner who is not registered here, it is desirable both for him and for the hospital that he should have the status of a registered medical practitioner as the holder of that post; and section 8 enables him to become temporarily registered for that purpose.

The procedure for temporary registration under the section is quite simple, and it is only necessary to add that a practitioner who is not a British subject must, of course, as a first step obtain permission from the Home Office to enter and to remain in the U.K. in order to do postgraduate work.

R. C. MAC KEITH
Guy's Hospital, London, S.E.1. Hon. Secretary, The Horse Shoe Club.

MALLEOLAR FRACTURES

SIR,—In his article of July 9, Dr. Herzog did well to emphasise the importance of inversion as a cause of fracture of the external malleolus.

In work as yet unpublished I have found that fractures of the external malleolus unaccompanied by other fractures or by dislocations fall into four groups.

1. A complete fracture with minimal displacement, appearing in the lateral view as an oblique crack extending up and back from the anterior cortex at joint-level to the posterior cortex $^{3}/_{4}$ in. above joint-level, and in the anteroposterior view as a line running up and out from joint-level.
2. A transverse fracture below joint-level and about $^{1}/_{2}$ in. above the tip of the malleolus, the separation being wider at the outer end.
3. A fracture of the tip of the malleolus.
4. A fracture of the fibula above joint-level but extending to within 1 in. of the ankle-joint, the fracture-line running up, out, and back.

In my series there was no group of transverse fractures at joint-level. A single case of this type did occur, and in contrast to all the other cases it was due to direct violence. On the other hand it is common experience that transverse fractures at joint-level occur in association with fractures of the internal malleolus. It follows then that the nature of the indirect violence which will produce a transverse fracture at joint-level is such that it must also break the internal malleolus or ligament. This combination of injuries occurs in the "2nd-degree abduction type" of malleolar fractures or in the "follow-through" injury[1] mentioned by Herzog. In my series all but three of the cases of isolated fractures of the external malleolus due to an indirect violence the nature of which was recorded, were due to an inversion strain. Inversion does not, therefore, cause a transverse fracture at joint-level. This is produced only by abduction or by the "follow-through" injury (which is virtually abduction), and then only in association with a lesion of the internal malleolus or ligament.

This is indeed what one should expect on considering the mechanics of the two strains—inversion and abduction. On forced inversion the talus begins to tilt when the limit of subastragaloid movement has been reached, and the strain is on the external ligament and the lower end of the fibula. This strain will either rupture the ligament, pull off a fragment of the malleolus, or, using the lower edge of the tibia as a fulcrum, bend the lower part of the fibular shaft and crack it above joint-level. In abduction there is a horizontal outward movement of the talus which causes simultaneously a direct impact against the external malleolus and a pull on the internal malleolus and the internal ligament—a dual action which produces a dual lesion.

Of 41 cases of isolated fractures of the external malleolus in which the nature of the indirect violence was described by the patient, all but 3 were due to an inversion strain. Now it is generally accepted that fractures of types 2 and 3 are due to an inversion strain. But type 1, an oblique fracture of the external malleolus running up from joint-level, corresponds to what is often described as a "first-degree external-rotation injury." Yet this was the commonest of the four types (about 66%), and no case of external-rotation strain was recorded in the series. The conclusion that the type 1 is no exception to the rule that all fractures confined to the external malleolus are inversion injuries, is reinforced by the following points.

(a) Inversion strain is by common experience the most frequent indirect violence to which the ankle is subject. The most common *bony* injury due to indirect violence affecting the ankle is fracture of the external malleolus, and of such fractures type 1 is the most frequent.

(b) An external-rotation injury involves a violent twist of the astragalus, so that the anterior part of the outer edge of the superior articular surface hits the anterior margin of external malleolus synchronously with the impact of posterior part of its inner edge against the posterior margi the internal malleolus. It is difficult to conceive that viol of this nature would result in a single bony injury.

(c) Cases of type-1 injury are sometimes associated cases of type 2 and type 3 which are undoubtedly du inversion.

Thus fractures of the external malleolus consequ on indirect violence and unassociated with other b or complete ligamentous injury in the region of a are due to an inversion strain, and this conclusion d not except the oblique fracture running up from jo level which is more often attributed to an exter rotation injury.

With regard to "eversion" as a factor in the prod tion of malleolar injuries, I do not believe this to important. It is prevented from acting on the talus the downward projection of the external malle along the whole depth of the talus. The short inte malleolus on the other hand is not a barrier to inver of the talus.

Scunthorpe. DAVID THOMAS

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[1] Perkins, G. Fractures. London, 1943.

LOCATION OF RENAL PAIN

SIR,—In view of the various theories about visc pain which have been upheld in your columns, I wo like to report the following case.

A girl of 15 complained of right-sided abdominal pain; on examination the pain was found to be localised to the ri loin. There was tenderness in the right costophrenic an and slightly in the left costophrenic angle. Pus cells *Bact. coli* were found in the urine, and right-sided a pyelitis was diagnosed.

Subsequently, however, intravenous and retrograde py grams showed that the right kidney was on the left side, below the left kidney; its ureter crossed the midline in lower lumbar region, and turning downwards entered bladder at the normal site.

Thus at the site where the pain was felt and wl most of the tenderness was elicited, there was in no kidney. This illustrates that where the pain is depends on the nerve-supply and not on the positio the viscus in which it is produced.

London, N.W.1. E. M. POULTON

COMPLICATIONS OF PARA-AMINOSALICYLIC ACID THERAPY

SIR,—Since *p*-aminosalicylic acid (P.A.S.) is be increasingly used in the treatment of tuberculosis, seems worth recording our experience of its undesira effects in two patients.

CASE 1.—A male musician, aged 40, had had bilateral act pulmonary tuberculosis diagnosed in January, 1947, a several months' failing health and productive cough. He had 20 months' rest in bed before admission to Colindale August, 1948.

On admission he was fairly ill with moderate fever, sev cough, and 7 oz. of sputum daily. A chest radiogram sho two giant cavities in the left upper lobe and old disease the right lung. The symptoms were greatly relieved keeping the patient resting on his left side, with the foot his bed raised 10 inches. Six weeks later a routine ch radiogram showed "atelectasis" of his left lung, and a so focus taking the place of one cavity. Bronchoscopy sho a normal bronchial tree. The symptoms returned only af attempts at re-aerating the left lung. Two months lat in December, 1948, sodium *p*-aminosalicylate 6 g. twice da was given. There was again improvement in the gene condition and considerable relief of symptoms. Twenty-f days later the patient became acutely ill, with mala anorexia, nausea, headache, and intense photophobia, fev and physical restlessness. The cerebrospinal fluid showed abnormality, and a chest radiogram no apparent chan 'Benadryl' 100 mg. two or three times a day appeared give some relief.

After a further week it became apparent that there were cute exacerbations of symptoms, starting about 10 min. fter the giving of a dose of P.A.S. Particularly prominent at his stage was the patient's complaint of intense generalised kin irritation (apart from scratch marks no rash was seen) nd a ceaseless violent non-productive cough. Subsequently he patient told of his fear to close his eyes, because of bright ashes of vivid colours. Withdrawal of P.A.S. produced almost mmediate relief of symptoms. Later, mild symptoms—mainly kin irritation and cough—were caused by as little as 0·25 g. f P.A.S. An intradermal injection of 0·05 g. did not produce ny skin reaction. All blood and urine examinations have een normal. At no time was a high level of P.A.S. detected n the blood.

This seems to be a true case of acquired idiosyncrasy to P.A.S., the explanation of which is not apparent. The light suppressive action of benadryl suggests that a ocal liberation of "histamine-like" substances may have been one of the factors involved. The patient gave no history suggesting allergy. The sodium *p*-aminosalicylate was made up freshly on alternate days, from powder supplied by the manufacturers, in 2 oz. of water flavoured with a few minims of liquorice. Neither before nor after the event did the patient show any sensitivity to salicylate in the form of aspirin or other compound tablets.

CASE 2.—A male motor mechanic, aged 26, had had active pulmonary tuberculosis diagnosed in December, 1945, after radiography of his chest because of pain in his back. The film had shown a limited lesion in the left lung.

On admission to Colindale in March, 1946, the disease had extended locally and spread to the opposite lung. Treated on routine lines in bed his condition had improved sufficiently for a left artificial pneumothorax to be attempted in July, 1946; this was found to be contra-selective and was abandoned. No further active treatment was attempted till September, 1947, when an anterior stage thoracoplasty was done as a preliminary to inserting a drainage tube into a giant cavity, to be followed by a posterior thoracoplasty. In October, 1947, the patient was found to have proteinuria and an enlarged liver. Amyloidosis was diagnosed and subsequently confirmed by liver biopsy; 6–10 g. of protein was excreted daily in the urine for the next twelve months.

A course of P.A.S. 12 g. daily in six doses was started in October, 1948, and continued for four weeks, during which time the urinary protein excretion increased to 20–30 g. daily. The urine also contained a few red blood-cells and numerous granular and hyaline casts, a few of which gave the congo-red reaction. Various urinary excretion tests all fell within normal limits. The blood-urea level remained normal, and the blood-proteins amounted to 5–6 g. per 100 ml.—average albumin 2·5 g. per 100 ml., and globulin 3 g. per 100 ml. There was no increase of blood-pressure. An occasional transient œdema was noted. After withdrawal of P.A.S. the urinary protein excretion slowly dropped and finally stabilised at about 10–12 g. daily. P.A.S. therapy produced no change in the patient's general condition or the radiological appearance of the chest.

Though there is no evidence that the diseased kidneys were irreparably damaged by P.A.S., it is certain that the glomeruli were affected in some way, allowing increased protein filtration, and for this reason it seems advisable to refrain from using P.A.S. where there is evidence of generalised disease of the nephrons. In some forty other patients treated with P.A.S. the only urinary abnormality detected has been the occasional presence of red blood-cells, and in none of these cases was it necessary to discontinue treatment.

Colindale Hospital, London. M. HEMMING
C. J. STEWART.

SIR,—During a recent therapeutic trial of *p*-aminosalicylic acid (P.A.S.) in rheumatoid arthritis, of 6 cases treated 5 developed hypoprothrombinæmia. Hæmorrhagic levels were not reached, but in 2 cases the prothrombin-index was reduced to 50% and 57% of normal, without any evidence of liver dysfunction. The dosage of the drug was 15 g. daily by mouth, given in 5 doses of 3 g. at three-hourly intervals. The prothrombin-times were estimated by the technique of Quick,[1] Fullerton's[2] 'Stypven' modification being used in 3 instances.

There is no mention of this effect of P.A.S. in reports on the use of this drug in tuberculosis, where higher dosage has often been given. This action, however, is well known to occur during the exhibition of other salicylates, and fatal hæmorrhages recorded in rheumatic fever may in part be attributable to these drugs. Unexpected hæmorrhages have been recorded recently in your columns by Nagley and Logg,[3] who had 5 cases of frank hæmaturia during the treatment of pulmonary tuberculosis with P.A.S. While there may be some doubt about the conclusion that the bleeding in these cases was due to crystallisation of the drug in the urinary tract, it is obviously undesirable for hæmorrhage to take place in the presence of hypoprothrombinæmia.

Department of Medicine, University of Edinburgh. J. NORRIE SWANSON.

MECHANICAL RESPIRATION

SIR,—Dr. Blackwell's article in your issue of July 16, though helpful in many respects, brings into prominence the deplorable absence of information, not only regarding the best types of respirator but also regarding the instructions which should be issued to those who—often unexpectedly—have to take charge of a patient with respiratory paralysis.

With regard to the nursing of the respirator case, an excellent publication on the subject can be obtained on request from the National Foundation, 120, Broadway, New York 5, N.Y. A lung inflator or resuscitator should also be available to maintain artificial respiration, so that the patient can be removed from the box without anxiety. Indeed short periods of artificial respiration with an inflator will sometimes be sufficient to tide over a period of respiratory distress. The type with a hand-operated valve is probably better than the McKesson type referred to by Dr. Blackwell, for the skilled operator can time the hand-operated valve to assist the patient's spontaneous effort to breathe. The Oxford inhaler referred to by Dr. Blackwell is much inferior to the Oxford inflator,* which is a highly efficient resuscitator.

Dr. Blackwell refers to a situation in which "the patient nearly dies if the machine is opened for more than a few seconds," but this will not occur with a suitable inflator. The patient can quickly become accustomed to a hand-operated inflator if it is used first (with accurate timing and at low pressure) while the patient is still in the respirator.

Dr. Blackwell concludes that the Stille is the best respirator available, but the evidence on which this conclusion is based is not clear. There is an obvious need for a small research unit, which should include a respiratory physiologist, to study the efficiency of respirators. Only by this means can we learn the relative advantages of the different makes.

Finally, a word about bulbar cases with secretions or perhaps vomit obstructing the larynx. These secretions must be removed by sucker and steep postural drainage at 30–40°. Use of the respirator in such an emergency is disastrous and usually causes death, since it forcibly sucks the secretions into the lungs. In bulbar cases, if the muscles of respiration are acting even weakly the respirator should be avoided, but the angle of postural drainage must be so steep that all fluids fall out of the pharynx. A tilting bed of the type used for bronchiectasis is useful for this type of case, and can incidentally be

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1. Quick, A. J. *J. Amer. med. Ass.* 1938, 110, 1658.
2. Fullerton, H. W. *Lancet*, 1940, ii, 195.
3. Nagley, M. M., Logg, M. H. *Ibid*, 1949, i, 913.

* As supplied by Medical and Industrial Equipment, Ltd., 12, New Cavendish Street, London, W.1.

used for artificial respiration by the rocking method. If the muscles of respiration fail, the respirator must also be used; but postural drainage must be maintained in the respirator by tilting the box steeply, and a sucker should be at hand to maintain a free airway.

Oxford. W. RITCHIE RUSSELL.

EPIDEMIOLOGY OF POLIOMYELITIS

SIR,—I would like to thank Dr. Sweetnam for his letter in your issue of July 16.

I think it is fair to say that some strains of poliomyelitis virus are inactivated by pasteurisation, while others are not. Much work on this subject has been done with the Lansing strain of virus which many American workers today consider to be unrepresentative. Conclusions based on such work may therefore not be valid. Incidentally, I should like to point out that I am not contesting the desirability of universal pasteurisation, which in fact I cordially support. I am merely concerned with the policy to be adopted in the face of an outbreak suspected to be spread by milk. Would it be sufficient to rely on pasteurisation? Personally I feel it would be safer to advise that the milk should be boiled.

The County Hall, London, S.E.1. G. E. BREEN.

SIR,—In this district shortly before and during the poliomyelitis season last year there was an unusual mortality amongst hedgehogs. Has such a coincidence been noticed in other districts? Is the hedgehog susceptible to poliomyelitis virus?

It is entirely premature to theorise about the hedgehog as a reservoir host or as a possible laboratory animal; but it may be worth while to experiment with it. "There is more missed by not looking than by not knowing." Laboratory workers who propose to experiment with them are warned that hedgehogs are very verminous animals; they cannot scratch themselves.

D. P. LAMBERT
Settle, Yorks. Divisional Medical Officer.

THE MENSTRUAL CYCLE

SIR,—Dr. Geiringer, whose views on the control of the menstrual cycle you published on July 9, is right that the importance of the adrenal cortex increases as new information about its functions becomes known. There is, however, no experimental foundation for his statement that "adrenal cortical hormones have as constant and decisive an influence in determining the events of the normal menstrual cycle as the pituitary and ovarian hormones"—unless one understands by this merely that the adrenal cortex is essential to life.

The fact is that the œstrous cycle stops after removal of either the pituitary or the ovaries. It does not stop after adrenalectomy provided salt is administered. This treatment may also restore menstrual function in a patient with Addison's disease who has amenorrhœa. Contrary to the implication in Dr. Geiringer's letter, there is no general agreement that amenorrhœa is a common feature of this disease. But since Dr. Geiringer suggests that I have underemphasised the importance of the adrenal cortex in the menstrual cycle, may I draw his attention to work[1] mentioned in my lecture which provides the most direct evidence that I know of for the view that this gland undergoes cyclical changes in relation to those which occur in the female reproductive organs. I do not, however, know whether this work has been corroborated.

It is well known that a variety of sex hormones can be extracted from the adrenal cortex; that disturbance of the production of these hormones will affect reproductive processes; and that the gonads and adrenal cortex are derived from adjacent parts of the embr These facts, however, in no way justify Dr. Geiring view that the adrenal cortex is "the mother-orga the gonads," or that it plays an important rôle in determination—a belief which, to the best of knowledge, has no scientific foundation.

Birmingham. S. ZUCKERMA

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[1] Bourne, G., Zuckerman, S. *J. Endocrinol.* 1940, 2, 268, 283.

Parliament

QUESTION TIME

Grading of Hospital Medical Officers

Mr. V. J. COLLINS asked the Minister of Health if he w define the qualifications of a senior hospital medical o and the minimum qualifications of a consultant under National Health Service.—Mr. A. BEVAN replied: I shoul presume to do so. Each individual case needs judging o merits, by local professional committees suited to the Mr. COLLINS: Is the Minister aware that owing to the of information on this subject there is a great deal of confu and dissatisfaction? Does he not think that a stater would be helpful to all persons concerned?—Mr. BEV I cannot issue any general information on this matter. grade to which a doctor belongs is decided by a professi committee, and I have not the least intention of interfe with that committee. They decide each case on its me and I can do no more than leave the matter to the mem of the profession concerned.

Squadron-Leader E. L. FLEMING: Can the Minister whether, where a doctor has been demoted from a highe a lower grade, he has a right of appeal to anybody?— BEVAN: It is wrong to speak of demoting. This is the time that grading has been done; therefore there can b demoting from a superior to an inferior grade. There review of the initial decision, and arrangements have made to establish machinery for the purpose.

Advertising Appliances

Sir HUGH LUCAS-TOOTH asked the Minister whether he aware of the practice of commercial firms advertising their particular appliances could be obtained entirely fr charge under the National Health Service, and offerin names and addresses were sent to them, to advise applic of procedure; and whether he would introduce legislatio put an end to this practice.—Mr. BEVAN replied: Action already been taken to stop advertising in connexion hospital appliances, and similar steps are being considere cover appliances supplied through the National Health Ser

Rubery Hill Mental Hospital

Mr. A. R. BLACKBURN asked the Minister whether he completed his inquiry into conditions at Rubery Hill Me Hospital; and with what result.—Mr. BEVAN replied: questions in the House involved three main issues:

(*a*) The alleged wrongful certification of old people.
(*b*) The understaffing of Rubery Hill Mental Hospital.
(*c*) The circumstances attending the death of a patient at hospital.

The result of the inquiries on the first point is that, as not a single name has been forthcoming of any person could be shown to have been wrongfully certified under Lunacy Acts. The Ministry of Health deprecate the ce fication of old people if it can possibly be avoided and if h are available outside mental hospitals; and recommendati have been made to the regional boards in this matter. necessity for certification may arise in some cases becaus the moment the only suitable accommodation available i our mental hospitals; but no case has come to notice which a person certified was not of unsound mind.

Two officers of the Ministry of Health have visited Rub Hill Hospital and reported in detail on the nursing positi The female staff has recently increased by six, and act steps are being taken to stimulate recruitment. The inspect officers have made some detailed recommendations which be communicated to the management committee of hospital. In general, they found that the staff is prope controlled, that the administration of the hospital is go and that the staff work as a happy team.

The circumstances attending the death of a patient were ie subject of an inquest by the coroner sitting with jury. verdict of accidental death was returned, and the matter as dealt with in the debate on the adjournment of the ouse on June 3.

Free Clothes for Hospital Patients

Mr. HAYDN DAVIES asked the Minister to what extent it was is practice to provide free clothes for hospital patients.—Ir. BEVAN replied: I shall be glad to clear up the many ross misrepresentations on this matter. I have told hositals, in effect, to go on doing what was already proper iospital practice before the health service began—that is to end clothing to patients who cannot provide it for themselves r get it from any other agency, and to let them keep it on lischarge when inquiries make it clear that they cannot therwise get it. It will normally only arise, as in the past, or long-stay ambulant patients without resources.

Spectacles

In answer to a question, Mr. BEVAN stated that the total lemand for the United Kingdom in the first six months of 1949 was estimated at 5 million pairs. Production during the same period was about 3·7 million pairs, representing an increase of 75% on the annual rate of production during 1947. Production in this country continued to be rapidly expanded and suitable lenses were being imported from abroad.

Over-prescribing

Mr. PETER FREEMAN asked the Minister whether he was aware that much larger quantities of medicines were frequently supplied on National Health Service prescriptions than were necessary; and what steps were being taken to prevent such waste of public money.—Mr. BEVAN replied: A doctor whose prescriptions suggest extravagance may have his prescribing investigated by a local professional committee. Before this he would be given the opportunity of explaining his reasons to, and being advised by, one of my department's medical officers.

Central Purchase of Medical Stores

Mr. A. M. SKEFFINGTON asked the Minister of Health what economies had so far resulted from the centralised purchase of medical stores and equipment.—Mr. BEVAN replied: I regret that a precise estimate of savings on central purchase of medical stores and equipment for the National Health Service is not available. If I had to give a broad estimate I should say something like £2 million.

Compound E

Mr. A. R. BLACKBURN asked the Lord President of the Council, in view of the satisfactory evidence as to the efficacy of compound E in the treatment of rheumatic diseases, what steps were being taken through the Medical Research Council or other bodies to ensure the production of this drug on a large scale at the earliest possible date.—Mr. HERBERT MORRISON replied: Research aimed at finding effective new substances akin to compound E is in active progress under the Medical Research Council, but I am advised that all these compounds are exceptionally difficult to make and that early success is not to be expected. Large-scale production of compound E itself is a matter for commercial laboratories rather than the council, but here again the difficulty of synthesis must hamper speed, and I understand that the American manufacturers of the compound have intimated that it is unlikely to be generally available for use by doctors even in the United States for several years at least.

Dangers of New Insecticides and Fungicides

Mr. T. E. N. DRIBERG asked the Lord President of the Council whether he was aware of the large number of commercial insecticides and fungicides, containing dangerous poisons, now offered for sale to food-growers and smallholders; and what steps were taken by his department, in conjunction with the Ministries of Food and Agriculture, to test fully, and over a considerable period of time, the effects of these products on plants and on human beings.—Mr. HERBERT MORRISON replied: The Agricultural Research Council and the Medical Research Council are aware of the potential dangers of the indiscriminate use of some of the new insecticides and fungicides and there is a special toxicity subcommittee of the Research Coördinating Committee on Insecticides, a body appointed jointly by the Medical Research Council, the Department of Scientific and Industrial Research, and the Agricultural Research Council, which arranges for the examination of new materials. As to the effect of insecticides and fungicides on plants, active and continuing research is in progress at several agricultural research institutes. In regard to the effect on human beings, the Agricultural Research Council works in close collaboration with the toxicology committee of the Medical Research Council. The inquiries of that committee include long-term studies.

Pay of Army Nurses

Brigadier A. H. HEAD asked the Secretary of State for War whether he was satisfied with the present strength of the Queen Alexandra's Royal Auxiliary Nursing Corps; and when he expected to make an announcement regarding the new conditions of service and pay of this corps.—Mr. EMANUEL SHINWELL replied: The Army, like the civil hospitals, is having considerable difficulty in securing the services of nurses. The strength of the Queen Alexandra's Royal Army Nursing Corps is more than 900 below establishment, and civilian nurses are being employed as a temporary expedient. I hope that it will be possible for a statement on the new conditions of service to be made shortly.

Public Health

Cold Floors

IN his work, *The Physiological Basis of Medicine*, Graham Brown observed that long after the civilised world had adopted the habit of finishing a meal with coffee, the scientists came along to prove that it was good for digestion to do so. Scientists working in two separate departments of government-sponsored research have now proved similarly what we already know—that to the bare foot a concrete floor feels colder than almost any other.

For his observations on floors, N. S. Billington,[1] of the building research board of the Department of Scientific and Industrial Research, used an electrical "foot" consisting of a metal canister fitted with a thick, flat, copper base which is insulated on top and at the sides.

The temperature of the under-surface of the "foot" is measured by copper-constantan thermocouple wires attached to the base of the canister and connected to a sensitive galvanometer. Water—150 ml. at about 120°F—is placed in the canister and stirred continuously. The canister is allowed to cool on a slab of cork, and a cooling-curve is plotted. When the water temperature has fallen to 100°F the canister is quickly transferred to the specimen, and readings of the base temperature are taken at 10-sec. intervals for 2 min. and thereafter less frequently. The experiment may continue for 5–15 min. When the temperature of the water is 100°F, the base temperature is about 97·5°F.

In a second series of tests the base of the canister was covered with the sole of a shoe, about $^1/_4$ in. thick. The base temperature recorded still refers to the underside of the copper base and not to the surface of the "shoe."

Billington concludes that his experiments "lend support to the common belief that a concrete floor feels colder than a wooden floor at the same temperature: although, when shoes are worn, the difference due to the actual nature of the floor finish seems likely to be small." He recommends for places like bedrooms and bathrooms, where people are likely to be walking barefoot, floors of wood, cork tile, linoleum on wood, and carpets, but suggests that these types of floor (giving a sensation of warmth) are not so important for kitchens, offices, factories, and nurseries, "where people stand or sit for lengthy periods." This reference to nurseries is strange because it is standard practice amongst those who can afford it to have their nurseries at home covered whenever possible with cork linoleum so that the infant shall get no sensation of chill when it stands or crawls; Billington seems to think that this end could be achieved by placing underneath the "cold" material, which should be as thinly spread as possible, an insulating layer.

Munro and Chrenko,[2] of the Medical Research Council, have also been testing the effect of various flooring

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1. Billington, N. S. *J. Hyg., Camb.* 1949, 46, 445.
2. Munro, A. F., Chrenko, F. A. *Ibid*, p. 451.

materials on "the thermal sensations and skin temperature of the feet"; in their experiments they have used not any artificial "feet" but the natural variety—their own. Some tests were made when their feet were bare, and others when they were shod with shoes of normal weight and medium thick soles over light-weight woollen socks. (This seems to represent considerably greater insulation than was used by Billington when his electrical "foot" was shod by a sole of only $^1/_4$ in. thickness.) As the primary aim of their investigation was to study the effects of different floor materials on the comfort of the feet, the subjects were seated throughout the test period, it being argued that the effects of the materials would be greatest under these circumstances, and that if people are moving about in a room with a concrete floor the effect of the floor on the thermal comfort of the feet is likely to be less than when they are seated. This argument, which seems reasonable enough, is in direct conflict with the views of Billington that cold floors are not of much moment to people who sit for lengthy periods.

The range of the observations by Munro and Chrenko was wider than Billington's, taking in the effects of air temperature and velocity as well as of the floor material in contact with the feet. But although these additional factors have a bearing on their results, they still agree with Billington that a cork floor generally is more "comfortable" than a concrete one. ("Comfort" is here used in a rather specialised, "thermal" sense.) Unlike Billington, who sought to reduce the chilling effect of cold floors by putting a layer of insulating material *under* them, the other two observers tried linoleum over concrete; they were disappointed in the result. They conclude that changes in the skin temperatures and in the sensations on the sole of the bare foot correspond approximately to the thermal conductivities of floor materials. They also explain why foot chill may seem more pronounced after exercise. When anyone sits down after exercise two factors, they say, may operate. There is less heat-production which may have the effect of reducing the central blood requirement and thus of increasing the peripheral supply. Venous stasis will be encouraged by diminution of the normal massaging action of the muscles on the blood-vessels, and this may induce a temporary rise in skin temperature. Heat may still be accumulating in the limb, since its skin temperature is low and the heat-loss may not exceed the heat produced within the limb or conveyed to it; hence the initial sensation of warmth. Very soon, however, the heat-inflow to the limb diminishes, and simultaneously, for the reasons already given, the skin temperature rises, so heat no longer accumulates at the previous rate and the sensation of warmth progressively diminishes. Finally, heat-dissipation exceeds heat-inflow and a progressive fall in skin temperature becomes associated with subjective feelings of cooling in the limb.

The *Eleventh Annual Year Book of the American Public Health Association*, for 1940–41,[3] contains an outline of air standards for the maintenance of comfort, health, and efficiency, assuming altitudes not exceeding 10,000 ft. above sea-level. These are: cool rather than hot (though avoiding a sense of chilliness); dry rather than damp; still or moving, depending upon physical activity; some diversity in temperature (rather than uniformity and monotony); and *foot level as warm as head level.* Munro and Chrenko themselves, linking their foot observations with general considerations of ventilation and metabolism, finally conclude that, assuming uniform conditions of heating, the air temperature is the dominant factor influencing the thermal comfort of the feet, but that there is a value of air temperature below which floors of high conductivity are undesirable.

Infected Milk in Yorkshire

We are indebted to Dr. D. P. Lambert, divisional medical officer, Settle, for the following information.

On June 30 this year, farm S, supplying school milk, was short of the required quantity and bought milk from farm D. The cowman at farm D had been ill with diarrhœa and vomiting during the week, but had said nothing and carried on with his work. It was hay-time; everybody was very busy. This consignment infected milk from farm D was stored overnight in refrigerator and distributed along with farm S milk schools in Settle rural district on July 1. On July 332 cases of food-poisoning occurred amongst sch children who drank milk from this consignment. Th were no cases in Skipton rural district, which unmixed milk from farm S, and no cases on farm retail milk-round. There were 3 mild cases on farm milk-round, and 2 moderately severe cases on the fa itself.

The symptoms were fever, headache, prostrati abdominal pain, vomiting, and diarrhœa. In mildest cases the symptoms were constitutional rat than abdominal, and were attributed at first to "a tou of the sun" or "teething." In the severer ca abdominal symptoms were more pronounced, a frequent stools were passed containing blood and muc Most cases were mild to moderate. There were deaths and no case was removed to hospital, thou some dozen probably would have been had this bee less rural area with hospitals nearer.

Salmonella typhi-murium was isolated from a case farm D, from a sample of the school milk for July from four out of six empty but unwashed milk bottl and from the stools of selected cases amongst scho children.

Poliomyelitis

In the week ended July 9 notifications were: pol myelitis 73 (80), polioencephalitis 4 (1). Figures for t previous week are shown in parentheses. Multiple cas (poliomyelitis and polioencephalitis together) we reported from: London 6 (6), Cheshire 2 (2), Cornw 5 (9), Devon 11 (4), Gloucestershire 3 (3), Hertfordsh 4 (3), Lancashire 5 (5), Middlesex 5 (9), Nottinghamsh 3 (0), Southampton 2 (1), Warwickshire 3 (1), Yorkshi West Riding 10 (9), Glamorgan 3 (1).

The general picture of incidence is very different fr that at the corresponding period in 1947. In 1947 early rise in incidence was chiefly in the more dens populated parts of central England, with additio foci in north-west Lancashire (Barrow) and on Tynesi This year, although there has been some rise of incide in the central parts, the chief increases have been in t west and south. Notifications in the West Riding Yorkshire have risen to 10 (9), but otherwise the no has remained remarkably free from the disease. T year, unlike 1947, there have been high attack-ra in relatively small and isolated communities.

Births, Marriages, and Deaths

BIRTHS

FOOTE.—On July 8, at Woking, the wife of Dr. E. S. Foote—a so

FOX.—On July 7, in London, the wife of Dr. D. G. R. Fox—daughter.

GILLESPIE.—On July 6, the wife of Dr. C. W. Gillespie—a daughter

HARPER.—On July 5, at Swindon, to Dr. Marita Harper (n Shattock), wife of Dr. Eric Harper—a daughter.

SHERRY.—On July 10, to Kathleen Robinson, F.R.C.S., wife Dr. Vincent Sherry—a daughter.

MARRIAGES

GIORDANI—HODGES.—On July 9, at Kingston-on-Thames, Aldo Giordani, M.R.C.S., to Christine Hodges, M.B.

WESTLAKE—WHITTON.—On June 29, at Alyth, Perthshire, Ern Keith Westlake, M.B., to Nora Whitton.

WRIGHTSON—PUMPHREY.—On July 9, at Halton, Bucks, Phil Wrightson, F.R.C.S., to Erica Prudence Pumphrey.

DEATHS

BROWN.—On July 13, at Gullane, East Lothian, Robert Archib Brown, M.B. Glasg., surgeon captain, R.N. retd.

CARRE-SMITH.—On July 11, in London, Herbert Lovell Carre-Smit M.R.C.S., aged 80.

COOKE.—On July 13, in London, Sir Douglas Cooke, M.B. Melb F.R.C.S., aged 70.

GOURLAY.—On July 15, at Rathmore, Elgin, Frederick Gourla M.D. Edin., aged 81.

JONES.—On July 11, at Beaconsfield, Lawrence Jones, M.S. Lond F.R.C.S.

MARSDEN.—On July 10, in Manchester, Richard Walter Marsde M.D., B.SC. Manc., F.R.C.P., D.P.H., aged 81.

RAIT-SMITH.—On July 11, at St. Albans, Brian Rait-Smith, B Camb., M.R.C.S., D.A., F.F.A.R.C.S.

SHACKEL.—On July 14, George Arthur Shackel, M.R.C.S., aged 8

WIGHT.—On June 22, at Dudley, George Douglas Wight, M.B. Edin D.P.H.

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[3] *Amer. J. publ. Hlth*, suppl. March, 1941.

Notes and News

CENTENARY AT WESTMINSTER

THE centenary celebrations of Westminster Medical School ened at Church House on July 14, when Mr. H. M. Clowes, airman of the medical school committee and council, esided over a large gathering which included over 150 mer students, many of whom had travelled long distances an expression of their devotion. The Earl of Athlone, ancellor of the University of London, in his opening address pressed his gratification that although the school as part the university had its separate legal existence with its own uncil, its ties with the hospital remained as close as ever. though barely eleven years had elapsed since the present hool buildings were opened, there was already talk of new ildings with a preclinical school, and for this scheme of velopment he could assure those responsible of the support the university.

Sir Ernest Rock Carling (dean of the medical school 1909–12) called that although the school properly constituted was day celebrating its hundredth birthday, it had much longer aditions in the system of apprenticeship by which pupils ere attached to one man responsible for all subjects of their lucation. Even 100 years ago the hospital could already ast among its past staff 16 fellows of the Royal Society, presidents of the Royal College of Physicians, and 4 presints of the Royal College of Surgeons. For a time all bjects of the curriculum were taught and taught with the ghest efficiency, until the school's sphere was limited to the inical period through the recommendations of the Adami port and arrangements were made by the University of ondon for appropriate assistance at King's College. It was ght to think with gratitude first of those who gave their me, experience, and wisdom to the governance of the hool—Sir John Wolfe-Barry, Sir Robert Hudson, Sir dward Pearson, Sir Thomas Butler, Colonel Bulkeley, Mr. aux Graham, and many others ending with Mr. Kenneth olfe-Barry, without whose courage, supported by the uthority and prestige of Mr. Goodenough, we should not ow be in possession of either school or hospital. Among edical giants, great teachers as well as great clinicians, Sir rnest singled out from personal association Sir William llchin and Charles Stonham whom he believed to have been he real founders of the modern school. It was impracticable give a complete list. Among those he recalled as physicians ere Sir Bryan Donkin, Charles Mercier, de Havilland Hall, ir James Purves-Stewart, Sir Stanley Woodwark, Drummond obinson, and Hildred Carlill; as surgeons, A. H. Tubby, alter Spencer, William Turner, Arthur Evans, Tudor dwards, Stanley Dodd, and Arthur Griffiths.

Sir Adolphe Abrahams (dean of the medical school 1934–43) escribed the transformation effected by the migration from pathetic little building in Caxton Street to the present agnificent edifice. In contrasting the large with the small chool, he emphasised as a particular advantage of the small chool that its staff was necessarily recruited largely from utside its own students, and that when a vacancy occurred ompetition was thrown open to the whole world. The uccessful candidate brought to the school all the necessary ttributes and still more the traditions, the reputation, and he wisdom of other teaching institutions. The teaching taff now numbered more than fifty. Of these about a quarter ere Westminster's own sons—a remarkable proportion for o small a school. The remainder included representatives rom no fewer than eight of the other great metropolitan chools—from Edinburgh, Aberdeen, Dublin, Belfast, Liverool, Manchester, Birmingham, and Bristol, and from ustralia and New Zealand. Academically and in sport the tudents exhibited a keenness, a distinction, and a success hich were remarkable in regard to their numbers. Mr. G. H. acnab (the present dean) said there were now 230 students, he large majority taking university degrees. He described he difficulties relating to the proposed creation of a teaching entre with 1000 beds to provide facilities for 400–500 prelinical and clinical students. In addition it was necessary o keep undergraduate and postgraduate teaching in separate ompartments. He deplored the premature specialisation in cientific subjects demanded by competition. Only about ne in sixteen of those interviewed gained a place in the chool. Another complication was the influence of compulsory ational service in the Armed Forces for a boy but not for girl. He was dubious of the method of selection by a committee and believed a personal interview to be the supreme test, especially when opportunity was afforded for full consideration of the candidate's background. He was confident of Westminster's ability to provide the right training for the best type of doctor in the next century, as in the past.

LIVERPOOL RESOLUTION ON GRADING

AT a meeting of the Liverpool Regional Hospitals Medical Association on July 11, the following resolution was passed.

"This meeting regrets that, in spite of cases of upgrading, there are many anomalies still existing both with regard to groups and to individuals. We are particularly concerned about the two specialties venereology and tuberculosis, in which the grading has been almost uniformly that of senior hospital medical officer. We feel that low grading will inevitably have a depressing effect on efficiency in the future, since recruitment will fall in quality. Some of the individual grading seems to us so unjust that we feel that it is essential that fresh consideration to individual appeals should be given forthwith. We therefore heartily support the British Medical Association's claim for the setting up of regional appeal committees before which the appellant will have the right to appear in person and be represented."

RESEARCH IN EDINBURGH

IN the report for 1948 of the laboratory of the Royal College of Physicians of Edinburgh, Dr. R. Cranston Low, the curator, records that for the first time the annual number of reports on clinical material has exceeded 30,000. The 100, 1000, 10,000, and 20,000 marks were passed in 1891, 1898, 1925, and 1938; and the increase shows no sign of abating. In the research field, the relation between chemical structure and antimalarial activity is being investigated, and new derivatives of *p*-phenanthroline and 2:3-benzacridine have been synthesised. Benzthiazole compounds have been synthesised and are being tested for possible antifilarial activity. An analysis of the relations between chloride content and electrical conductivity in human milk has shown that both are abnormally high in mothers with an inadequate supply of milk. In the bacteriological department, Dr. W. M. Levinthal has continued typing smooth pneumococci; since 1942 more than 1000 strains have been identified.

ALCOHOLISM IN SWITZERLAND

Switzerland has extensive vineyards; and the average annual consumption of alcoholic drinks amounts to about 8 litres (compared with $4^{1}/_{2}$–5 litres in Great Britain), consumed mostly as wine. This was explained to the Society for the Study of Addiction on July 12 by Dr. Henri Revilliod, who estimated that the average Englishman drinks 4 times more beer but 100 times less wine than the Swiss. In Switzerland spirit-drinking, which had disastrous effects in the German-Swiss cantons during the 19th century, has been greatly reduced through the federal alcohol monopoly. The chief cause of alcoholism in French Switzerland is wine in the countryside and aperitifs in the towns, whereas in the German-Swiss cantons cider and spirits are more popular. In Switzerland cirrhosis of the liver is apparently more common than in any other country and is thought to arise chiefly from protracted mild alcoholism. Cirrhosis has been found at 11% of necropsies (14% of males, 7·5% of females); in 91% of the cases the condition was attributed to alcoholism, and very often the liver disorder had not been diagnosed during life.

Inebriates are treated at 75 centres—the "anti-alcoholic dispensaries"—and where necessary in homes for the rehabilitation of addicts (six for men, three for women). Since 1946 patients have been admitted to hospital in Geneva for treatment with apomorphine. Of 73 addicts psychologically normal or with some disorder due to alcoholism, 72% abstained from alcohol for three months, and 46% for more than two years after treatment.

Hospital Board Appointments

The Minister of Health has made the following medical appointments:

Oxford regional hospital board.—Prof. T. Pomfret Kilner, F.R.C.S., in succession to Prof. A. W. M. Ellis.

Eastman Dental Clinic board of governors.—C. F. Ballard, M.R.C.S., L.D.S.

National Hospital for Nervous Diseases board of governors.—Macdonald Critchley, F.R.C.P., in succession to Dr. J. Purdon Martin.

Hammersmith, West London, and St. Mark's Hospitals board of governors.—L. Comyns, L.R.C.P.E., M.P.

University of Cambridge

On June 21 the degree of M.D. was conferred on T. S. Hindle.

An Elmore research studentship has been awarded to Dr. D. R. Smith.

University of London

At a recent examination for the academic postgraduate diploma in public health the following were successful:

Abdulla Omar Abushamma, R. F. Barclay, Shriniwas Yeshwant 'sh, J. F. E. Bloss, L. B. De Lanerolle, Habib . E. G. Earle, L. G. Eddey, T. P. Eddy, S. J. , A. W. Gilks, A. H. Griffith, R. F. Guymer, W. G. Harding, C. H. Hoskyn, Esther Jackson, Shelly A. Jones, Wickramaratchyge Ajitha Karunaratne, Mohan Singh Kataria, D. A. Kuruppu, M. G. Langdon, P. A. Lee, R. N. C. McCurdy, J. C. McDonald, T. C. Macdonald, J. J. McNair, J. R. Mayers, Isobel S. Mowat, G. M. O'Donnell, C. E. Phillip, Isabella M. Pinkerton, J. St. C. Polson, R. H. Pratt, P. G. Roads, C. L. E. H. Sharp, R. A. G. Smith, D. G. Snell, W. B. Thorburn, R. N. Wilson.

University of Liverpool

At recent examinations the following were successful:

M.D.—C. V. Donnelly, J. G. P. Jones, Edith M. McConnell, P. L. Robinson, W. Sircus, A. H. Williams.

M.Rad.—(*Part I*) J. Ainsworth, Constance M. Davis; (*Part II*) J. F. Doherty, W. J. L. Francis, B. B. Harrison, W. Kulke, J. P. MacLaughlin, A. S. Whitehead, F. B. Wright.

M.B.,Ch.B.—Brenda M. Heathcote, W. B. Jennett, J. C. Richardson (with second-class honours); Margaret Addison, D. U. Bloor, Rosemary J. Bolam, R. Bradshaw, K. W. Brewster, P. Burrows, Anthea M. Bushby, Jean O. R. Carmichael, Mary I. Charlesworth, Jean M. Collins, Beryl C. Davies, Catherine M. Durkin, W. Ellis, O. L. Evans, Shelagh J. Fair, G. H. Fletcher, R. I. Green, I. W. Griffith, Margaret E. Hall, D. B. Hargreaves, J. F. Hobson, W. M. Hunter, P. Hurst, Margaret L. Johnson, J. L. Jones, R. E. Jones, R. H. Jones, Margaret Knox, Margaret A. Lees, Halina Z. Lewinska, D. H. Lloyd, Marcia McArthur, Audrey M. L. Owens, Ethel Owens, W. R. Parry, S. Plumpton, Sheila M. Pope, Ursula C. Pope, J. N. Rimmer, R. K. Rimmer, Myfanwy R. H. Roberts, E. Rogansky, H. U. Shaw, Pauline R. Sullivan, J. C. Taylor, R. P. Watkins, D. L. Williams, J. A. Williams.

D.P.H.—D. J. Cusiter, Elinor M. Evans, S. Ghousuddin, K. G. Koshi, D. A. W. Nugent, G. P. Reed, H. D. Sutherland, W. F. Wille.

Royal College of Surgeons of England

At a meeting of the council held on July 14 Sir Cecil Wakeley was elected president in succession to Lord Webb-Johnson. Sir Harry Platt and Prof. Ernest Finch were elected vice-presidents. Mr. Digby Chamberlain, Sir Stanford Cade, and Mr. A. Dickson Wright were admitted as members of the council. Prof. D. E. Derry, of Cairo, was admitted to the fellowship, having been elected as a medical practitioner of 20 years' standing.

The following were elected lecturers:

Hunterian professors: Mr. R. I. Harris, spondylolisthesis; Prof. C. F. M. Saint, stomatodæal ruminations; Dr. S. A. Henry, cutaneous cancer in relation to occupation; Mr. Denis Browne, congenital deformities of the urethra, vagina, and anus; Mr. J. B. Oldham, renal denervation; Mr. J. E. Piercy, safety in surgery of the thyroid; Mr. J. E. A. O'Connell, lumbar intervertebral disc protrusion; Prof. H. F. Moseley, ruptures of the rotator cuff; Mr. H. L. M. Roualle, malignant disease of thyroid gland; Mr. E. M. Evans, fractures of the radius and ulna; Dr. Ruth E. M. Bowden, functional recovery of peripheral nerve injuries; Mr. R. S. Murley, postoperative venous thrombosis and embolism; Mr. M. R. Ewing, villous tumours of the rectum; Mr. E. M. Nanson, respiratory responses to operative trauma. *Arris and Gale lecturers:* Mr. D. F. E. Nash, renal damage in chil Hirschsprung's disease; Mr. E. S. R. mammary gland. *Erasmus Wilson* Shattock, Mr. P. H. Mitchiner, Dr. L. *strators:* Mr. R. J. Last, Dr. F. S. Gorr Sir Henry Wade.

Diplomas of fellowship were granted to Manibhai Ashabhai Patel and Himadri Kumar Sarkar. The following diplomas were granted jointly with the Royal College of Physicians:

D.L.O.—B. S. Alderson, S. W. Allinson, Narendra Chandra Banerjee, H. A. Beagley, R. D. Bell, D. L. Chadwick, S. L. Citron, G. A. Dalton, W. V. Doyle-Kelly, C. N. d'E. Eastes, Ladislav Fisch, Tej Bahadur Gupta, E. W. R. Hackett, J. T. M. C. Jenkins, Thulukanam Manickam, Andrej Mares, S. R. Mawson, M. J. Maxwell, M. F. A. O'Connor, M. L. O'Mara, J. T. Rossouw, C. C. D. Shute, Noreen M. Simpson, J. N. S. Taylor, J. D. Thompson.

D.P.M.—Yousif Ibrahim Al-Kadi, G. H. L. Bullmore, R. L. Buttle, Tigani Elmahi, Markus Engler, M. B. Feldman, W. N. L. Haynes, Sri Kishen Jetley, D. H. Jones, D. T. Maclay, Jayantilal Chhotalal Marfatia, J. R. Mathers, Doddaballapur Lakshminarasimha Murti Rao, C. M. Vaillant, W. S. Watson.

Faculty of Anæsthetists.—T. J. Gilmartin, Alan Cogswell, T. T. P. Murphy, and W. D. Arnison were elected to the fellowship of the faculty.

Biochemical Society

A meeting of this society will be held in the biochemistry department, University College, Dundee, on Friday, July 29, at 11 A.M.

Edinburgh Post-Graduate Board for Medicine

On Thursday, July 28, at 4.30 P.M., in the anatomy lectur theatre of the university, Sir Lionel Whitby will speak o the Present Position Regarding Leukæmia.

Society of Medical Officers of Health

Dr. H. C. Maurice Williams, medical officer of health f Southampton, has been elected president of the society f the year 1949–50.

W.H.O. Executive Board

Sir Aly Tewfik Shousha, Pasha, has been succeeded in th chairmanship of this board by Sir Arcot Lakshmanaswam Mudaliar, vice-chancellor and professor of obstetrics an gynæcology in the University of Madras.

Institute for the Scientific Treatment of Delinquency

Courses of university extension lectures for the diploma i social studies will begin at the institute at the end o September. Further particulars may be had from th education secretary, 8, Bourdon Street, London, W.1.

Advisory Council for the Welfare of Handicappe Persons

The Minister of Health has appointed Mr. Edward Evan M.P., chairman of this council in place of Lord Rushcliff who has resigned owing to continued ill health.

Royal Institution

The managers of the institution have awarded the Actonia prize of 100 guineas for 1949 to Sir Alexander Fleming F.R.S., for his paper, published in 1945, on Penicillin—i Discovery, Development, and Uses in the Field of Medicin and Surgery.

Special Diets for Hospital Patients

The medical staffs of hospitals are reminded that they ma give certificates for extra rations to patients about to b discharged and to outpatients. The conditions for whic extra rations are granted and the medical information require are set out in the Ministry of Food Circular Med. 2, of whic doctors may obtain copies at the local food office.

British Medical Association

The council of the association is offering prizes in 195 to medical students for essays on Clinical Teaching in Relatio to the Practice of Medicine. Further particulars may be ha from the secretary of the association, B.M.A. House, Tavistoc Square, London, W.C.1, to whom essays should be sent no later than Dec. 31, 1949.

Conference on Health Education

The Central Council for Health Education is holding a national conference at the Central Hall, Westminster, S.W.1, on Tuesday and Wednesday, Nov. 8 and 9. Further information may be had from the medical adviser and secretary of the council, Tavistock House, Tavistock Square, London, W.C.1.

Congress of Military Medicine

The 12th Congrès International de Médecine et de Pharmacie Militaires will be held in Mexico from Oct. 23 to 29 and will be followed by a conference of the Office International de Documentation de Médecine Militaire at Havana from Nov. 6 to 8. The address of the Comité International de Médecine et de Pharmacie Militaires is 79, rue Saint-Laurent, Liége, Belgium.

Appointments

FERREIRA, H. P., M.B. Lond.: asst. pathologist to Queen Charlotte's and Chelsea Hospitals, at Chelsea Hospital for Women.

KEEPING, JOYCE, M.D. Lond., M.R.C.P.: physician, Paddingt Chest Clinic.

Hospital for Sick Children, Great Ormond Street, London:

HANNA, D. M., M.D. N.Z., M.R.C.P., M.R.A.C.P.: house-physician.
MACAULAY, J. C., M.B. Lond.: house-physician.
PIMM, L. H., M.B. Lond.: house-surgeon.
WALKER-BRASH, R. M. T., B.M. Oxfd: house-surgeon.
WATERSTON, D. J., M.B.E., M.B. Edin., F.R.C.S., F.R.C.S.E.: part-time surgical registrar.

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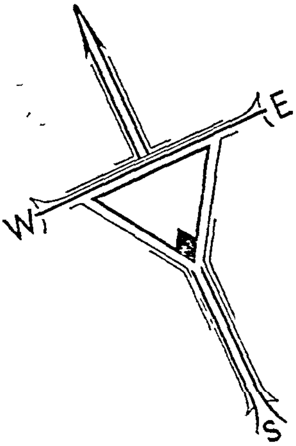
The problem of the run-down, debilitated child is shared by medical men throughout the world . . . and the universal answer is a tonic at once restorative, formative and protective. Syrup Minadex is such a tonic, combining three distinct therapeutic groups—iron, copper and manganese for their haemopoietic properties; the glycerophosphates of calcium, sodium and potassium, traditional nerve restoratives; and vitamins A and D to promote the growth of healthy tissues. These ingredients are combined in a delicious orange-flavoured syrup, making Minadex acceptable to the most fastidious palate in the warmest climate.



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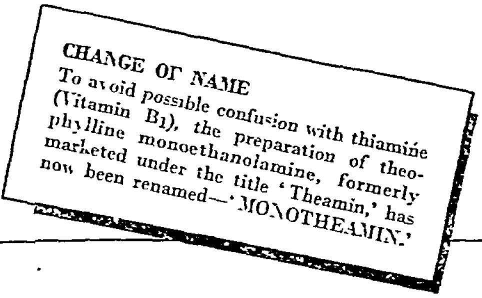
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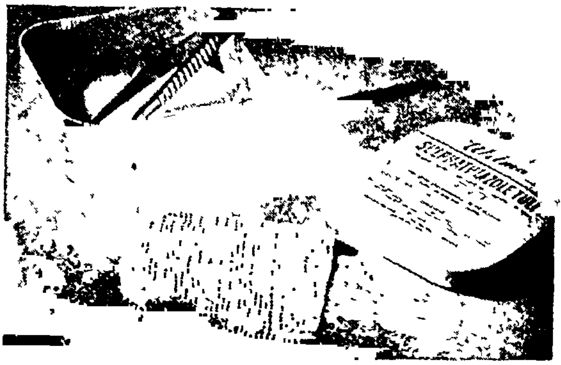

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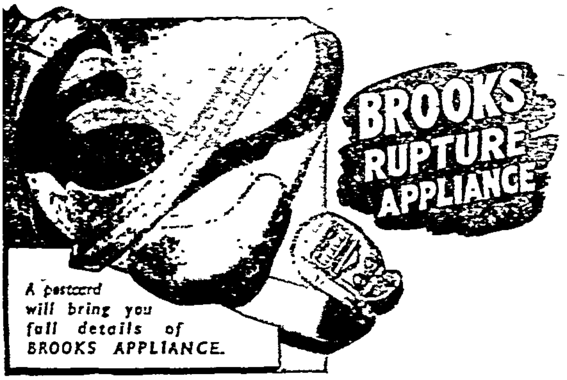

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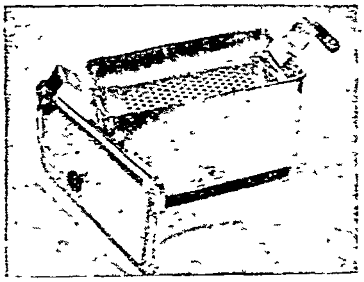

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For terms and further particulars apply to the Medical Superintendent (TELEPHONE: 2356 and 2357 Northampton), who can be seen in London by appointment.

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The Pioneer Hospital, opened 1796, for the humane treatment of those suffering from Nervous and Mental Disorder

This Independent Hospital of 260 beds, administered by a Committee of the Society of Friends, combines what is best in the investigation and treatment of nervous illness with a sympathetic and friendly atmosphere. In 1948, 371 patients were admitted, of whom no fewer than 306 were voluntary cases.

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Consulting Physician: J. Barrie Murray, M.A., M.D., M.R.C.P.
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A Private Nursing Home for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

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BRITISH POSTGRADUATE MEDICAL FEDERATION

REFRESHER COURSES FOR GENERAL PRACTITIONERS
SEPTEMBER–DECEMBER, 1949

Date	*No. of weeks*	*Subject*	*Hospital*
5th–10th September	1	Obstetrics and gynæcology	Paddington Group
12th–17th September	1	General	Archway Group of Hospitals
3rd–8th October	1	Obstetrics and gynæcology	North Middlesex Hospital, Edmonton, N.18
10th–15th October	1	General	Hackney Hospital, E.9
6th October–15th December (extended)	1 afternoon weekly	General	War Memorial Hospital, Woolwich
6th October–15th December (extended)	1 afternoon weekly	General	Southend-on-Sea Group
24th–29th October	1	Obstetrics and gynæcology	Sussex Maternity Hospital, Brighton
24th October–5th November	2	General	Fulham and Kensington Hospitals
7th–12th November	1	Obstetrics and gynæcology	Southend-on-Sea Group
14th–18th November	1	Obstetrics and gynæcology	Lewisham Hospital, S.E.13
21st–26th November	1	General	Royal Sussex County Hospital, Brighton
21st November–3rd December	2	General	Royal Northern Hospital, Holloway-road, N.7

Fees: 10 guineas for 2 weeks' course; 5 guineas for 1 week and for extended courses. Schemes of financial assistance are available, subject to certain conditions, for (*a*) demobilised general practitioners, and (*b*) N.H.S. practitioners.

Applications for places and for further information should be made to the Secretary, British Postgraduate Medical Federation, 3, Gordon-square, W.C.1. They should state if the practitioner is applying under (*a*) or (*b*) above, or neither.

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Staff Examiners in Forensic Medicine, Hygiene (M.D. only), Neurology, Obstetrics and Gynæcology, Oto-Rhino-Laryngology, Psychological Medicine, Surgery, Therapeutics.

Associate Examiners in Medicine, Obstetrics and Gynæcology, Surgery.

Applications must be received not later than 1st September, 1949, by the Principal, University of London, Senate House, W.C.1, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF LONDON

APPOINTMENT OF EXAMINER IN FACULTY OF MEDICINE

The Senate invites applications for a Staff Examinership in Tropical Medicine for the M.D. Degree in 1950.

Applications must be received not later than 1st September, 1949, by the Principal, University of London, Senate House, W.C.1, from whom further particulars and forms of application may be obtained.

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The fee for this 3 months' course is 18 guineas, payable in advance.

Applications should be made to the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2.

Lectures will be held at 5 P.M.

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POSTGRADUATE COURSE IN VENEREOLOGY 1ST SEPTEMBER–15TH DECEMBER, 1949. The course will include systematic lectures covering the whole subject of venereology, outpatient sessions, ward visits, laboratory instruction, and tutorial demonstrations. Students will be allotted by groups to outpatient sessions and ward visits.

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Applications to the House Governor, St. Peter's Hospital, Henrietta-street, London, W.C.2.

INSTITUTE OF DISEASES OF THE CHEST

A course of Lectures on INDUSTRIAL PULMONARY DISEASE will be given by guest lecturers during the Autumn Term, 1949, on FRIDAYS at 5 P.M.

30th Sept.	History and Theory of Silicosis	Prof. E. J. KING
7th Oct.	Pathology of the Coal-miner's Lung	Prof. J. GOUGH
14th Oct.	Pneumokoniosis of Coal-miners	Dr. C. M. FLETCHER
21st Oct.	Pathology of Pneumokoniosis	Dr. S. ROODHOUSE GLOYNE
28th Oct.	Effects of Dusts of Vegetable Origin	Dr. K. M. A. PERRY
4th Nov.	Silicosis	Dr. L. W. HALE
11th Nov.	Asbestosis; Talc, China Clay, and other Silicates	Dr. H. WYERS
18th Nov.	Siderosis	Dr. A. I. G. MCLAUGHLIN
25th Nov.	Industrial Aspects of New Growths of the Respiratory Tract	Dr. A. J. AMOR
2nd Dec.	Industrial Aspects of Pulmonary Tuberculosis	Dr. ALICE STEWART
9th Dec.	Manganese, Beryllium, Vanadium, and Platinum	Dr. T. A. LLOYD DAVIES
16th Dec.	Industrial Lung Disease due to Gases	Dr. A. THELWALL JONES

These Lectures will be open to enrolled students of the Institute without extra fee. A limited number of tickets are available for the course at a fee of £3 3s.

Applications should be made enclosing remittance to the Dean, Institute of Diseases of the Chest, Brompton Hospital, S.W.3.

THE NATIONAL HOSPITAL, Queen-square, London, W.C.1

INSTITUTE OF NEUROLOGY

EXTRA LECTURES

The following Lectures will be held in the Lecture Theatre at 5 P.M., and are open to all doctors interested.

Tuesday, 19th July	Dr. PAUL C. BUCY, Neuropsychiatric Institute, Chicago	The Relationship of the Temporal Lobes to Behaviour in Primates
Thursday, 21st July	Prof. KURT GOLDSTEIN, New York	The Two Sets of Symptoms in Damage of the Brain Cortex
Monday, 25th July	Prof. K. S. LASHLEY, Yerkes Laboratories of Primate Biology, Florida	A Dynamic Interpretation of Cerebral Function
Friday, 26th Aug.	Prof. J. LAWRENCE POOL, Columbia University, New York	Topectomy; cortical ablation for treatment of mental illness
Monday, 12th Sept. Tuesday, 13th Sept.	Dr. MORRIS B. BENDER, College of Medicine, New York University	Disorders in Perception (*a*) Extinction of sensation; (*b*) Displacement of Sensation
Friday, 7th Oct.	Dr. WILDER PENFIELD, Neurological Institute, Montreal	Observations on the Anatomy of Memory
Monday, 10th Oct.	Dr. FOSTER KENNEDY, New York	Allergic Manifestations in the Nervous System

CHARING CROSS HOSPITAL MEDICAL SCHOOL, 62, Chandos-place, London, W.C.2. Applications invited for following whole-time appointments:—

[illegible] CAL BIOCHEMIST. A medical [illegible] not essential. Present salary range [illegible] superannuable. [illegible] Organic and Biochemistry. Present [illegible] Medical qualifications [illegible] dical qualifi- [illegible] –£550.

In all cases salary range will be adjusted in the light of any nationally agreed scales, and family allowances paid where applicable.

Further information and forms of application for appointment may be obtained from the Secretary.

UNIVERSITY OF LONDON. The Senate invite applications for the CHAIR OF OBSTETRICS AND GYNÆCOLOGY tenable at the Institute of Obstetrics and Gynæcology. Salary £2750 a year.

Applications (10 copies), must be received not later than 21st September, 1949, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF BIRMINGHAM. Department of Pathology. Applications invited for post of LECTURER IN PATHOLOGY, commencing 15th September, 1949. Salary £600 p.a. Duties include morbid anatomical services in the United Hospitals (post mortem and histological) and University teaching. Time will be available for research studies in pathology or clinical science. Preference given to candidates with an interest in neuropathology and some experience of clinical neurology.

Applications, giving particulars of experience, medical and other qualifications, and names of 2 referees, should reach undersigned by 20th August, 1949. C. G. BURTON, Secretary.

The U[illegible]

UNIVERSITY OF BIRMINGHAM [illegible]
tions in [illegible]
IN SU [illegible]
for Uni [illegible]
within t [illegible]
and ranks as of specialist status. Candidates must be medically qualified; on the Medical Register; and hold the Fellowship of the Royal College of Surgeons of England.

Applications (12 copies), with names of 3 referees, should be sent by 27th August, 1949, to C. G. BURTON, Secretary.

The University, Birmingham, 3, July, 1949.

THE UNIVERSITY OF SHEFFIELD. Applications invited for posts of:—

SENIOR LECTURER or LECTURER IN PHYSIOLOGY,
ASSISTANT LECTURER IN PHYSIOLOGY,

to begin duties 1st October, 1949, or as soon as possible thereafter. Salary scales: (*a*) for candidates holding a registered medical qualification, Senior Lecturer £1500–£1800; Lecturer £700–£1500; Assistant Lecturer £600–£650; (*b*) for other candidates, Senior Lecturer £1150–£1400; Lecturer £550–£1100; Assistant Lecturer £450–£500. Commencing salary in each grade according to qualifications and experience, with superannuation provision under the F.S.S.U., and a family allowance.

Applications (4 copies), with names and addresses of referees, and, if desired, copies of testimonials, should reach undersigned (from whom further particulars may be obtained) by 27th August, 1949. A. W. CHAPMAN, Registrar.

THE UNIVERSITY OF SHEFFIELD. Applications invited for post of RESEARCH FELLOW AND TUTOR IN THERAPEUTICS, to begin duties as soon as possible. Applicants must be members of one of the Royal Colleges of Physicians. Appointee will be expected to carry out original investigations in the clinical field. Duties will also involve some teaching in [illegible] ed medicine. Salary £700–£1300, with [illegible] n under the F.S.S.U., and a family [illegible] salary will depend upon the qualifications and experience of the successful candidate.

Applications (4 copies), including names and addresses of 2 referees, and, if desired, copies of testimonials, should reach undersigned (from whom further particulars may be obtained) by 12th August, 1949. A. W. CHAPMAN, Registrar.

THE UNIVERSITY OF SHEFFIELD. Applications invited for post of Full-time TUTOR IN CHILD HEALTH, to begin duties as soon as possible. The Tutor's duties will be those of clinical work, teaching, and research under the Full-time Professor of Child Health (Professor R. S. Illingworth). He will be responsible for supervision of students in the Department of Child Health, and will be required to assist in the arrangement and instruction of classes and tutorial groups. Salary within range £700–£1300 a year, according to qualifications and experience. There will be superannuation provision under the F.S.S.U., and a family allowance. Appointment will be for 12 months in th [illegible] be renewed.

Applications ([illegible] d addresses of 3 referees, and, if desired, [illegible] hould be sent to undersigned (from w [illegible] may be obtained) by 6th August, 1949. A. W. CHAPMAN, Registrar.

THE UNIVERSITY OF SHEFFIELD. Applications invited for posts of:—

[illegible] or LECTURER IN ANATOMY,
[illegible] ANATOMY,

[illegible] 949, or as soon as possible ther[illegible] Lecturer £1500–£1800; Lecturer [illegible] 600–£650. Commencing salary [illegible] ualifications and experience, with [illegible] ler the F.S.S.U., and a family allowance.

Applications (4 copies), with names and addresses of referees, and, if desired, copies of testimonials, should reach undersigned (from whom further particulars may be obtained) by 13th August, 1949. A. W. CHAPMAN Registrar.

THE MIDDLESEX HOSPITAL, W.1 Applications invited for post of FIRST ASSISTANT to the Professorial Medical Unit. Commencing salary between £1250 and £1500 p.a., according to age and experience.

Applications, stating age, qualifications, &c., and nominating 3 referees, should be sent to the Secretary of the Medical School by 12 noon, Thursday, 11th August, 1949.

UNIVERSITY COLLEGE, Ibadan, Nigeria. Applications invited for post of LECTURER IN [illegible] on a scale rising from £850 p.a., b [illegible] 50 to £1000 p.a. (plus expatriation allowance of [illegible] p.a.), point of entry being determined by qualifications and experience. Partly furnished accommodation is provided at a rent not exceeding 10 per cent of salary. Superannuation is on an F.S.S.U. basis. Passages are paid for members of staff and wives on first appointment and on annual leave.

Applications (6 copies), giving full details of qualifications and experience, and names of 3 referees, should be forwarded before 15th August, 1949, to the Secretary, Inter-University Council for Higher Education in the Colonies, 8, Park-street, London, W.1, from whom further particulars may be obtained.

Hospital Services : Senior Appointments

NATIONAL HEART HOSPITAL, Westmoreland-street, London, W.1. The Board of Governors invites applications for post of ASSISTANT PHYSICIAN (part-time). Applicants must be graduates in medicine of a British or approved university and Fellows or Members of the Royal College of Physicians of London. Successful applicant required to perform duties on 2 half-days per week and salary will be in accordance with the scale for specialists finally agreed between the profession and the Ministry of Health. Post subject to National Health Service (Superannuation) Regulations, 1947/48.

Applications, giving age, qualifications, present appointments (including [illegible] eferees, should be sent to me [illegible] of the Board or Appointme [illegible]

ROBERT G. E. WHITNEY, Secretary to the Board of Governors.

Provincial

BRIDGEND. GLAMORGAN MENTAL HOSPITAL. Welsh REGIONAL HOSPITAL BOARD invite applications for whole-time post of CONSULTANT PSYCHIATRIST at above Hospital. Terms and conditions of service will be those recently announced. The Hospital consists of 3 parts: Parc and Glanrhyd Hospitals, with approximately 1000 Beds each; and Penyfia, a separate acute admission hospital of 120 Beds. A house is available, if required, and a deduction from salary will be made in respect of residential emoluments. Post subject to National Health Service (Superannuation) Regulations, 1947/48. Successful candidate expected to take part in the domiciliary service.

Applications, giving age, qualifications, and details of present and previous appointments with dates, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff, and submitted by 31st August, 1949. Canvassing will disqualify but this does not preclude candidates from visiting the hospitals.

R. E. REESE, Secretary to the Board.

BRISTOL. FRENCHAY HOSPITAL Required, Assistant Plastic SURGEON at above Hospital. Appointment will be of consultant status and candidates must have high professional qualifications and previous experience in plastic surgery. Salary, terms and conditions of service will be those negotiated for consultants between the Ministry of Health and the profession. [illegible] n a whole-time basis or on [illegible] ions per week.

[illegible] ations, and experience, with [illegible] and addresses of 2 referees, should be addressed to the Secretary of the South Western Regional Hospital Board, 5/6, Cotham Lawn-road, Bristol, 6, so as to reach him by 13th August, 1949.

DENBIGH. NORTH WALES HOSPITAL. Welsh Regional HOSPITAL BOARD invite applications for whole-time post of CONSULTANT PSYCHIATRIST to above Hospital. Terms and conditions of service will be those recently announced. This Hospital has 1187 Beds, provides all modern methods of psychiatric treatment, and has separate admission and convalescent units. A comprehensive outpatient service is provided by the Hospital for adults and children throughout North Wales. Accommodation is available, if required, and a deduction from salary will be made in respect of residential emoluments. Post subject to National Health Service (Superannuation) Regulations, 1947/48. Successful candidate expected to take part in the domiciliary service.

Applications, giving age, qualifications, and details of present and previous appointments with dates, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff, and submitted by 31st August, 1949. Canvassing will disqualify but this does not preclude candidates from visiting the hospital.

R. E. REESE, Secretary to the Board.

LEEDS REGIONAL HOSPITAL BOARD invite applications for post of CONSULTANT ANÆSTHETIST for duties in the hospitals of the Leeds A and Leeds B Hospital Management Committee. Appointment may be part-time (with maximum sessions) or whole-time, and rate of remuneration and conditions of service will be in accordance with those recently announced. Appointment subject to the passing of a medical examination, and the provisions of the National Health Service (Superannuation) Regulations, 1947/48 (unless as a transferred officer the [illegible] opted for the provisions of any other [illegible]

[illegible]: whether part-time or whole-time employment is preferred, with details of age, qualifications, experience, and names of 3 referees, should be forwarded to the Secretary to the Board, 29/31, Eastgate, Leeds, 2, by 30th July, 1949. Canvassing in any form, either directly or indirectly, will disqualify.

LEEDS REGIONAL HOSPITAL BOARD invite applications for post of E.N.T. SURGEON for duties mainly at hospitals in the Bradford A Hospital Management Committee Group with additional sessions in neighbouring groups. Appointment, which is of consultant status, will be part-time (with maximum sessions) and salary and conditions of service in accordance with those recently announced. Appointee may be expected to undertake extramural work for Local Authorities within the area. [illegible] tion, a [illegible] Regula [illegible] candidate has opted for the provisions of any other superannuation scheme).

Applications, with details of age, qualifications, experience, and names of 3 referees, should be forwarded to the Secretary to the Board, 29/31, Eastgate, Leeds, 2, by 30th July, 1949. Canvassing in any form, either directly or indirectly, will disqualify.

EAST ANGLIAN REGIONAL HOSPITAL BOARD invite applications for appointment of Whole-time PHYSICIAN for Mental Deficiency in the western (Cambridge) part of the East Anglian Region. Appointee will be Physician-Superintendent of Risbridge Home, Kedington, an institution of approximately 300 Beds, and of Riversfield Home, St. Neots, with 25 Beds. Duties will include the supervision of patients in other institutions and the conducting of outpatient clinics. Appointment will be of consultant status and subject to terms and conditions of service determined from time to time by the Minister of Health, and to provisions of National Health Service (Superannuation) Regulations, 1947/48.

Applications (10 copies), stating age, qualifications, experience, and present appointment, with names of 3 referees, should reach undersigned by 13th August, 1949. Canvassing of members of the Board or Advisory Appointments Committee will disqualify.

K. V. F. MORTON, Secretary.

117, Chesterton-road, Cambridge.

EAST ANGLIAN REGIONAL HOSPITAL BOARD invite applications for appointment of Whole-time PSYCHIATRIST for Child Guidance services in the Ipswich area. Appointee will be medical director of the central child guidance clinic and its branches. Appointment will be of consultant status and subject to terms and conditions of service determined from time to time by the Minister of Health, and to provisions of National Health Service (Superannuation) Regulations, 1947/48.

Applications (10 copies), stating age, qualifications, experience, and present appointment, with names of 3 referees, should reach undersigned by 13th August, 1949. Canvassing of members of the Board or Advisory Appointments Committee will disqualify

K. V. F. MORTON, Secretary.

117, Chesterton-road, Cambridge.

LIVERPOOL RADIUM INSTITUTE. Liverpool Regional Hospital BOARD invite applications from registered medical practitioners for appointment of SENIOR RADIOTHERAPIST (whole-time). Applicants should be of full specialist status, must possess a Diploma in Radiology and have had previous experience in radiotherapy. Salary in accordance with terms and conditions to be agreed between the profession and the Ministry of Health. Further information may be obtained from the Director of Radiotherapeutic Services, Radium Institute, Liverpool, 7.

Applications, giving full particulars of age, qualifications, and details of present and previous appointments with dates, with names of 3 referees, should be addressed to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received by 13th August, 1949.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for 4 specialist appointments as ASSISTANT RADIOTHERAPISTS in the Manchester Regional Cancer and Radiotherapy Service. Posts are permanent, whole-time and superannuable. Salaries and conditions of service will be those finally agreed between the Minister of Health and the profession. The specialists appointed will be on the staff of the Christie Hospital and Holt Radium Institute, Manchester, and will be required to conduct radiotherapy clinics in this and other hospitals in the Manchester Region. Further inquiries to Dr. Ralston Paterson, Director of the Holt Radium Institute, Christie Hospital, Wilmslow-road, Withington, Manchester, 20.

Applications, stating age, qualifications, training, and experience, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, 1, North Parade, Parsonage-gardens, Manchester, 3, and should be received by 27th August, 1949. Canvassing will disqualify.

J. GIBBON, Secretary of the Board.

MANCHESTER REGIONAL HOSPITAL BOARD. Appointment of PATHOLOGISTS. Applications invited for following specialist appointments. Terms and conditions of service will be those finally agreed between the Ministry of Health and the profession. Candidates must be of high professional standing with good training and wide experience. The appointments are whole-time and subject to National Health Service (Superannuation) Regulations, 1947/48.

Barrow-in-Furness. A new central laboratory is being formed and all types of clinical pathology for the Barrow and Furness group of hospitals will be undertaken.

Manchester, Booth Hall Hospital. A new laboratory has been provided which will act as the central laboratory for a group of children's hospitals.

Applicants for more than 1 appointment should state their preference.

Applications, stating age, qualifications, training and experience, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, No. 1, North Parade, Parsonage-gardens, Manchester, 3, and should be received by 3rd August, 1949. Canvassing will disqualify.

J. GIBBON, Secretary of the Board.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for post of ASSISTANT SENIOR MEDICAL OFFICER on the headquarters staff of the Board at a salary of £1450–£50–£1650 a year, subject to a deduction of 6% for superannuation purposes. Candidates must have had wide experience in the administration of health and hospital services and special experience of hospital planning would be an advantage. Successful candidate required to devote the whole of his time to his duties and to assist the Senior Administrative Medical Officer with the organisation and staffing of the hospital and specialist services within the region.

Applications, in envelopes endorsed "A.S.M.O.," giving particulars of qualifications and experience, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, 1, North Parade, Parsonage-gardens, Manchester, 3, and should be received by 27th August, 1949. Canvassing will disqualify. J. GIBBON, Secretary of the Board.

MANCHESTER UNITED HOSPITALS. **Manchester Royal Infirmary.** The Board of Governors invite applications for appointment of CONSU
(Diagnostic) of specialist status.
not holding the Fellowship of the
be considered if they have had sufficient experience of radiology. Appointment preferably full-time, but an appointment on a basis of 8 sessions per week approximately of a half-day duration would be considered. Remuneration according to the Ministry of Health scale for consultant rank, or on a pro rata basis per session.

Applications, with names of 3 referees, should be addressed to undersigned by 12th August, 1949.

By order, F. J. CABLE,
Secretary to the Board of Governors.
United Manchester Hospitals, Manchester Royal Infirmary.

NEWCASTLE UPON TYNE REGIONAL HOSPITAL BOARD. NORTH WEST DURHAM AND DURHAM HOSPITAL MANAGEMENT COMMITTEE GROUPS. (Main hospitals: Shotley Bridge, 500 Beds; Dryburn, 390 Beds; Durham County, 120 Beds; and Maiden Law, 100 Beds.) PÆDIATRICIAN, consultant status. Salary according to national scales. Appointment may be either full-time or part-time for a minimum of 9 sessions per week. Appointment will be in accordance with the terms and conditions of service subsequently agreed by the Ministry of Health, subject to National Health Service (Superannuation) Regulations, 1947/48, and to medical examination.

Applications, with names and addresses of 1–3 referees and/or
ior Administrative Medical Officer,
road, Newcastle upon Tyne, 2, by
ng will disqualify.

NEWCASTLE UPON TYNE REGIONAL HOSPITAL BOARD. DURHAM HOSPITAL MANAGEMENT COMMITTEE GROUP. (Dryburn Hospital, 390 Beds; Durham County Hospital, 120 Beds; &c.) DIRECTOR of Physical Medicine Department, consultant status. Salary according to national scales. Appointment may be either full-time or part-time for minimum of 9 sessions per week. Appointee responsible for rehabilitation and resettlement of patients at hospitals in above Group. He must be prepared to undertake duties in the Gateshead group of hospitals, probably for a considerable period pending an additional appointment. Appointment in accordance with terms and conditions of service subsequently agreed by the Ministry of Health, subject to National Health Service (Superannuation) Regulations, 1947/48, and to medical examination.

Applications, with names and addresses of 1–3 referees and/or
inistrative Medical Officer,
wcastle upon Tyne, 2, by
isqualify.

OXFORD UNITED HOSPITALS. **Applications invited for post** of Part-time ASSISTANT PÆDIATRICIAN. Appointment will carry with it consultant status. Candidates must be prepared to devote at least 8 notional half-days per week to the service of the United Oxford Hospitals and the Oxford Regional Hospital Board. Terms and conditions of service will be as those laid down for consultants in the National Health Service.

Applications, with 9 copies, with names of 3 referees, must reach the Administrator of the United Oxford Hospitals, The Radcliffe Infirmary, Oxford, by 13th August, 1949.

PONTYCLUN. HENSOL CASTLE MENTAL DEFICIENCY INSTITUTION, near PONTYCLUN, GLAMORGAN. WELSH REGIONAL HOSPITAL BOARD invite applications for post of CONSULTANT IN MENTAL DEFICIENCY and Whole-time MEDICAL SUPERINTENDENT of above Institution. Terms and conditions of service will be as recently announced. Hensol Castle, with its ancillary
training for approxima
of all grades. A hous
will be made in respec
to National Health
1947/48. Successful
domiciliary service.

Applications, giving age, qualifications, and details of present and
with names of 3 referees,
shou
Medical Officer,
Tem
ardiff, and sub-
mitt
disqualify but
this
the hospital.
to the Board.

SWAN A A WELSH REGIONAL HOSPITAL BOARD
invit
CONSULTANT
CHI
uccessful candi-
Guidance Clinic
date required to organise and develop
Services in Swansea and neighbouring districts. Terms and conditions of service will be those recently announced. Post subject to National Health Service (Superannuation) Regulations, 1947/48. Successful candidate expected to take part in the
qualifications, and details of present
an
with dates, with names of 3 referees,
should be addressed to the Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff, and submitted by 31st Aug
Canvassing will disqualify.
the Board.

TYNEMOUTH HOSPITAL GROUP, N
upon Tyne
REGIONAL HOSPITAL
SURGEON,
consultant status.
minimum of
9 sessions per wee
ional scales.
Appointment subject
ervice subse-
quently agreed by
alth Service
(Superannuation) Regulations, 1947/48, and to medical examination. Applicants must be prepared to work in any of the hospitals in the Tynemouth group and also in hospitals outside this group, in particular in the Wansbeck group.

Applications, with names and addresses of 1–3 referees and/or copy of 1–3 testimonials, to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, by 6th August, 1949. Canvassing will disqualify.

SOUTH WESTERN REGIONAL HOSPITAL BOARD is organising a geriatric service in the Region and invites applications from registered medical practitioners for appointments of GERIATRICIANS of consultant status in the Bristol and in the Exeter Clinical areas. The Bristol Clinical area includes Bristol and the contiguous districts of Somerset and Gloucestershire, and the Exeter Clinical area comprises Exeter, Torquay, North and East Devon. *Applicants must have high medical qualifications* and wide experience in medicine and should have experience of geriatrics. Appointments will be on a whole-time basis and the salaries and terms and conditions of service will be those negotiated for consultants between the Ministry of Health and the profession.

Applications, stating age, qualifications, and experience, with 10 copies
addresses of 2 referees,
should be
of the South Western
Regional
Lawn-road, Bristol, 6,
so as to re
Canvassing will be a
disqualification.

SUNDERLAND HOSPITAL MANAGEMENT COMMITTEE GROUP. NEWCASTLE UPON TYNE REGIONAL HOSPITAL BOARD. BACTERIOLOGIST (whole-time) of consultant status to be responsible for the bacteriological work under the Director of Pathology for Sunderland Hospital Management Committee group laboratories. Salary according to national scales. Appointment subject to terms and conditions of service subsequently agreed by the Ministry, to the National Health Service (Superannuation) Regulations, 1947/48, and to medical examination.

Applications, with names and addresses of 1–3 referees and 1–3 testimonials, to be forwarded to the Senior Administrative Medical Officer, "Blythswood South" Osborne-road, Newcastle upon Tyne, by 6th August, 1949. Canvassing will disqualify.

WEST CUMBERLAND HOSPITALS. ***Special Area Committee*** FOR CUMBERLAND AND NORTH WESTMORLAND. CONSULTANT RADIOLOGIST (diagnostic) for the West Cumberland group of hospitals (6 in number; total number of Beds, at present, 294, but substantial expansion is planned). Salary and conditions of service will be those finally agreed between the Ministry of Health and the profession. There are busy X-ray Departments at the Whitehaven and West Cumberland Hospital and at Workington Infirmary, the present Senior Radiologists of which will continue to visit in a consultative capacity at intervals for a limited time. There is also a small department at Maryport Cottage Hospital. At present the Senior Radiologist at the Cumberland Infirmary, Carlisle, has general supervisory charge of the radiological services in West Cumberland. In the future arrangements, as a means of effecting the necessary liaison between the East and West Cumberland groups of hospitals it is intended that the Radiologists in each group will deputise for each other during holidays and periods of sick leave and that they will
approved by the Special
Area Comm
during such times of the
service thro
pecial Area for Cumberland
and North
may elect to hold a part-
time appointment in which case a minimum of 8 sessions must be spent on public service duties in the hospitals. Appointment subject to National Health Service (Superannuation) Regulations, 1947/48, and to medical examination.

Applications, stati
erience, to
be sent to the Senior
"Dunira,"
Osborne-road, Newcas
1949, with
names and addresses
stimonials.
Canvassing will disqualify.

Hospital Services : Junior Appointments

CENTRAL MIDDLESEX HOSPITAL MANAGEMENT COM-
invited for SENIOR REGISTRAR
Child Guidance Training Centre, 6,
.1. from 1st October, 1949, for 8
medical sessions weekly. There will be no teaching duties in the first instance. Salary in accordance with national scales.
2 recent references, to Secretary, Central
pital Management Committee, Acton-lane.
y, 1949.

CONNAUGHT HOSPITAL, Walthamstow, E.17. There is a vacancy for CLINICAL ASSISTANT in the E.N.T. Department for 1 session a week on Thursday at 2 P.M. Salary at rate of £175 p.a. per half-day session.

Applications, with full details, to be sent immediately to R. HALTON HARRISON, Secretary, Hospital Management Committee, Forest Group No. 11, Administrative Offices, Langthorne-road, Leytonstone, E.11.

DREADNOUGHT SEAMEN'S HOSPITAL, *Greenwich, S.E.10.*
m registered British medical practitioners
SURGEON (B2), vacant 13th and 26th
Salary £300 p.a., with full residential
; age, qualifications, and medical school, with dates and previous experience, accompanied by names of not less than 3 referees, should be sent to arrive on or before 4th August, 1949, to— F. A. LYON, Secretary,
Seamen's Hospitals Management Committee.
Dreadnought Hospital, Greenwich, S E.10.

EAST HAM MEMORIAL HOSPITAL. Required, Resident OBSTETRIC OFFICER (B1), Male or Female (House Officer—third post). Salary £150 p.a., less a deduction of £100 p.a. for residential emoluments and subject to National Health Service (Superannuation)
Appointment in the
first instance for 6
9th August, 1949, but
successful candida
intment for a further
period of 6 months.

Applications, stating age and experience, with copies of testimonials, should be sent to the Secretary, West Ham Group Hospital Management Committee, c/o Queen Mary's Hospital *for the East End, Stratford, London, E.15, by 31st July, 1949.*

EDMONTON CHEST CLINIC, Fore-street, Edmonton. Required, SENIOR REGISTRAR (Full-time Assistant Chest Physician) for the Edmonton area. Applicants must have good experience n general medicine and diseases of the chest including tuberculosis and should hold a higher qualification. Duties include working at clinic and on tuberculosis wards of a hospital with 60 tuberculosis beds. Salary £1000 p.a., rising by £100 p.a. to £1300 p.a. Appointment subject to the conditions of service laid down by Ministry of Health and/or by the Hospital Manage-
ment Committee alth Service
(Superannuation
Applications, ience, with
names of 3 refer , Edmonton
Group Hospital Management Committee, North Middlesex Hospital, Silver-street, Edmonton, N.18, by 6th August, 1949.

HIGHLANDS HOSPITAL, Winchmore Hill, London, N.21. Applications invited from registered medical practitioners for following appointments for 6 months:—

HOUSE PHYSICIAN (A), vacant from 14th August, 1949.
HOUSE SURGEON (A), vacant from 22nd August, 1949.

Salary £350 p.a., less £100 p.a. for residential emoluments.
R for H.M. Forces or under 25½ years
of A post, considered.
s of 3 testimonials, to be sent to the
Se p Hospital Management Committee,
R Holloway, London, N.7, from whom
fo e obtained.

KING EDWARD MEMORIAL HOSPITAL, Ealing, W.13. Required, HOUSE PHYSICIAN (A), post vacant 18th August, 1949.
6 months' residential
emolument ualification
and liable ly.
Applicat tions with
dates, and cent testi-
monials, s Middlesex
Hospital Management Committee, 1, Churchfield-road, Ealing, W.13, by 28th July, 1949.

LONDON JEWISH HOSPITAL, Stepney Green, London, E.1. Required, RESIDENT HOUSE SURGEON, Grade I or II. Salary £350 and £400 p.a., respectively, less £100 deducted for residential emoluments. R practitioners holding A posts may apply, appointment being tenable for 6 months.

Forms of application obtainable from the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGE-MENT COMMITTEE, Hackney-road, E.2 Glamis-road, Shadwell, E.1, Banstead Wood, Surrey. Required, RESIDENT MEDICAL OFFICER (provisionally graded Junior Registrar), Male or Female, post vacant 1st September, 1949, at the Banstead Wood Country Hospital. Candidates must have had experience in the treatment of sick children. Salary £670 p.a. subject to a charge of £100 p.a. for *residential emoluments. Appointment* for 1 year in the first instance.

Application forms may be *obtained from undersigned* and should be returned with 1–3 testimonials by 8th August, 1949.

Hackney-road, E.2. CHARLES H. BESSELL, Secretary.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGE-MENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, Banstead Wood, Surrey. Required, 3 HOUSE OFFICERS (A) or (B2).
1949. These appointments,
ed *terms and conditions for*
range) will be made for two
as House Physician followed
by annual leave, and second period as House Surgeon and Casualty Officer. R practitioners within 3 months of qualification or holding A posts may apply.

Application forms obtainable from undersigned and should be returned, with *copies of 1–3 testimonials, on or before 9th* August, 1949.

Hackney-road, E.2. CHARLES H. BESSELL, Secretary

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, London, E.1. Required, RESIDENT HOUSE SURGEON, Grade I or II. Salary £350 and £400 p.a., respectively, less £100 deducted for *residential emoluments.* R practitioners holding A posts may apply, appointment being tenable for 6 months.

Forms of application obtainable from the Secretary, Stepney Group Hospital Management Committee. Raine-street, Wapping, E.1.

ST. JOHN'S HOSPITAL, Battersea. Battersea and Putney GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required for duty in the Geriatric Unit of above Hospital,
from mid for 6 months, and subject
to the n service.
Applic hould be addressed to the
Medical Hospital, by 20th August,
1949.

WANSTEAD HOSPITAL, E.11. (206 Beds.) Required, Casualty OFFICER (Male) to commence duty as soon as possible for 6 months. Salary £350–£450, according to experience, less £100
p.a. for oluments.
age, *qualifications, nationality, and*
nt testimonials, should be addressed to
Secretary, Hospital Management Committee, Forest Group No. 11, Administrative Offices, Langthorne-road, Leytonstone, London, E.11.

WESTMINSTER HOSPITAL, St. John's-gardens. Required,
REGISTR artment. Salary £650
p.a., subje according to national
scales now esident and will be held
for 1 year in the first instance. Preference given to holders of the D.M.R. but this qualification is not essential. Facilities for D.M.R. studies will be given. Applications are particularly invited from ex-Servicemen.

Applications (8 copies) should be sent by 6th August, 1949, to CHARLES M. POWER, House Governor and Secretary.

WILLESDEN CHEST CLINIC AND CENTRAL MIDDLESEX HOSPITAL. Applications invited for SENIOR REGISTRAR, non-resident, vacant 1st October, 1949. Higher medical qualifications essential. Experience in diagnosis and treatment of pulmonary tuberculosis required, together with good background of general medicine. Holder of post will be assistant to the Physician to Chest Clinic and will, under supervision, be responsible for treatment in tuberculosis wards and for teaching. Whole-time, 3–5 years' appointment, renewable annually. Salary £1000–£100–£1300 p.a.

Applications, stating age, qualifications, and experience, with names of 3 referees, to Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 15th August, 1949.

Provincial

ALTRINCHAM GENERAL HOSPITAL, near Manchester. (130 Beds.) HOUSE PHYSICIAN AND CASUALTY OFFICER (A), Male or Female, resident, required, to commence 15th August, 1949. 6 months' appointment. Salary £350, less emoluments valued at £100.

Applications, stating age, qualifications, &c., to the Secretary, North and Mid-Cheshire Hospital Management Committee, Altrincham General Hospital, Altrincham, Cheshire.

ALTRINCHAM GENERAL HOSPITAL, near Manchester. (130 Beds.) RESIDENT SURGICAL OFFICER (B1), Male or Female, required, to commence 16th August, 1949. 6 months' appointment. Salary £450, less emoluments valued at £100.

Applications, stating age, qualifications, and experience, to the Secretary, North and Mid-Cheshire Hospital Management Committee, Altrincham General Hospital, Altrincham, Cheshire.

ALTRINCHAM, ST. ANNE'S EAR, NOSE AND THROAT HOS-PITAL, near MANCHESTER. (50 Beds.) HOUSE SURGEON (B2), Male or Female, resident, required, to commence 3rd August, 1949. 6 months' appointment. Salary £400, less emoluments valued at £100.

Applications, stating age, qualifications, and experience, to the Secretary, North and Mid-Cheshire Hospital Management Committee, Altrincham General Hospital, Altrincham, Cheshire.

ASHTON-UNDER-LYNE. DISTRICT INFIRMARY. (200 Beds.) ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT CASUALTY OFFICER (Male) at a salary of £300–£350 p.a., according to experience, plus residential emoluments. The Infirmary serves a thickly populated industrial area and the scope for experience is wide and varied. The senior resident post is recognised for the Diploma or Fellow of the Royal College of Surgeons (England).

Applications should be addressed to—

R. W. McVITY, Secretary.

Astley-road, Stalybridge, Cheshire.

ASHTON-UNDER-LYNE. DISTRICT INFIRMARY. (200 Beds.) ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A), Male, at a salary of £250 p.a., with the usual residential emoluments. Ashton Infirmary is a busy general hospital 6 miles from Manchester and this post offers excellent opportunity to gain experience in general surgery; there is also a large orthopædic clinic and other Special Departments.

Applications should be addressed to—

R. W. McVITY, Secretary.

Astley-road, Stalybridge, Cheshire.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. AYLESBURY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A) or (B2), Male, post vacant now. Salary according to national scale for House Offices. Duties will include general surgery and House Surgeon to the E.N.T. Department. Practitioners within 3 months of qualification and liable under National Service Acts and those holding A posts may apply when appointment limited to 6 months.

Applications should be sent immediately to the Secretary-Superintendent.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. CASUALTY OFFICER (B2), Male, post vacant 31st August. Duties include HOUSE SURGEON to Accident and Orthopædic Departments. Salary according to national scale for House Officers. R practitioners holding A posts may apply, when appointment limited to 6 months.

Applications should be sent to Secretary-Superintendent by 6th August.

BANBURY, OXON. HORTON GENERAL HOSPITAL. (180 Beds.) BANBURY AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Required, JUNIOR HOUSE SURGEON, post vacant 31st July. Post for 6 months. Salary £300 p.a., with full residential emoluments.

Applications, with names and addresses of 2 referees, to be sent immediately to C. G. TOMLINSON, Secretary.

Horton General Hospital, Oxford-road, Banbury.

BATH. ROYAL UNITED HOSPITAL. House Surgeon required. Primary duties will be in Casualty and Outpatients Department. Candidates with previous hospital experience preferred. Salary and conditions of service in accordance with those laid down by the Ministry of Health.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, to be received by undersigned by 20th August, 1949.

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.
Manor Hospital, Bath, 15th July, 1949.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (209 Beds.) BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 25. Locum Tenens ANÆSTHETIST required immediately for an indefinite period. Remuneration 10–12 guineas per week, according to experience.

Applications immediately to—

W. GEORGE SPENCER, Secretary.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (209 Beds.) BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE, GROUP NO.25. Required, SURGICAL REGISTRAR (non-resident), Male or Female, for duties in the Casualty and Admission Department of the Hospital. Salary £350 p.a., plus £145 p.a. living-out allowance; subject to review when the National Health Service scales become operative. Appointment will, in the first place, be for 6 months. Applications from practitioners holding B1 appointments cannot be considered unless ineligible for H.M. Forces.

Applications to W. GEORGE SPENCER, Secretary.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (209 Beds.) BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 25. Required, HOUSE SURGEON (B2), Male or Female, post vacant immediately, to care for patients in association with the Medical Research Council Industrial Medicine and Burns Research Units. Appointment for 6 months with subsequent opportunities for research or surgical registrar posts. Salary £300 p.a., with full residential emoluments.

Applications to W. GEORGE SPENCER, Secretary.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (209 Beds.) BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 25. Required, HOUSE SURGEON (A) or (B2), Male or Female, post vacant immediately. Salary for newly qualified practitioners £250 p.a., full residential emoluments; the salary for practitioners who have already held hospital appointments £300 p.a., full residential emoluments. Appointment in the first place for 6 months.

Applications to W. GEORGE SPENCER, Secretary.

BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. THE UNITED BIRMINGHAM HOSPITALS. Required, HOUSE SURGEON (B2), Male or Female. Appointment for 6 months from 1st August, 1949. Salary in accordance with national scales for House Officers, with full residential emoluments. R practitioners holding A post may apply.

Applications, with copies of 2 testimonials, to be sent immediately to BERNARD SYLVESTER, House Governor.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. Required, HOUSE SURGEON (A). Facilities for studying for D.L.O. Salary £250 p.a., with full residential emoluments valued at £150 p.a., subject to review when the Spens agreement becomes operative. Appointment subject to National Health Service (Superannuation) Regulations, 1947. R practitioners, ineligible for H.M. Forces or under 25½ years not having held an A post, considered. To practitioners liable for service with H.M. Forces appointment limited to 6 months.

Applications, stating qualifications, experience, &c., with copies of not less than 2 recent testimonials, should be forwarded to J. PRESTON, Secretary, Hospital Management Committee, Dudley Road Hospital, Birmingham 18.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, Birmingham, 16. (150 Beds.) THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. Required, HOUSE SURGEON. Salary in accordance with recognised scales. Appointment subject to National Health Service (Superannuation) Regulations, 1947/48, and the passing of a satisfactory medical examination. There are 50 surgical beds under the care of a full-time Surgeon.

Applications, stating qualifications, experience, &c., with copies of 2 recent testimonials, should be forwarded by 2nd August, 1949, to—

J. PRESTON, Secretary, Hospital Management Committee.
Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE CHILDREN'S HOSPITAL, King Edward VII MEMORIAL, THE UNITED BIRMINGHAM HOSPITALS. Applications invited from registered medical practitioners, Male or Female, for posts of:—

HOUSE SURGEON (A), vacant 1st August, 1949.
ASSISTANT CASUALTY OFFICER (A), vacant 1st September, 1949.

Appointments for 6 months. Salaries
to experience, with a deduction of £100
tial emoluments. R practitioners within
may apply.

Forms of application obtainable from undersigned and should be returned as soon as possible.

N. R. WINWOOD House Governor.
Ladywood-road, Birmingham, 16, 12th July, 1949.

BIRMINGHAM UNITED HOSPITALS. Applications invited for following posts:—

For duty at the General Hospital

Whole-time REGISTRAR (B1), non-resident, to the Casualty Department. Candidates must be registered medical practitioners and preference given to those holding a higher qualification.

For duty at the Queen Elizabeth Hospital

RESIDENT SURGICAL OFFICER (B1). Candidates must be Fellows of the Royal College of Surgeons of England, Edinburgh, or Ireland, and have held a resident appointment in a teaching hospital.

RESIDENT SURGICAL REGISTRAR (B1). Candidates must have held a resident appointment in an approved hospital.
Salary . . . the new scales recently
issued by
Suitably
also those
to apply.

Applications, stating age, qualifications, experience, nationality, and present post, with copies of 3 recent testi-
monials, shou . . . whom all further
information n . . . t.
G. HURT . . . ham Hospitals.
The Queen . . . 15.

BIRMINGHAM. HEATHFIELD ROAD MATERNITY HOSPITAL, HANDSWORTH, BIRMINGHAM, 19. THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS: OBSTETRIC HOUSE SURGEON required for 6 months, commencing 1st September, 1949. Salary in accordance with the recognised scales. Appointment recognised for the D.Obst.R.C.O.G.

Applications, with copies of 3 testimonials, should be forwarded by 2nd August, 1949, to—

J. PRESTON, Secretary, Hospital Management Committee.
Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. Required, OBSTETRIC HOUSE SURGEON. Appointment for 6 months, commencing 1st September, 1949. Salary in accordance with the recognised scales. 50 Beds now in use; increasing to 140 during the year.

Applications, with copies of 2 recent testimonials, should be forwarded by 2nd August, 1949, to—

J. PRESTON, Secretary, Hospital Management Committee.
Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. Required, RESIDENT SURGICAL OFFICER. Appointment for 6 months, commencing 1st September, 1949. Salary in accordance with the recognised scales. 50 Beds now in use; increasing to 140 during the year.

Applications, with copies of 2 recent testimonials, should be forwarded by 2nd August, 1949, to—

J. PRESTON, Secretary, Hospital Management Committee.
Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. MOSELEY HALL HOSPITAL FOR CHILDREN. (80 Beds.) Required, RESIDENT MEDICAL OFFICER (Junior Registrar grade). R practitioners holding B1 posts eligible for H.M. Forces not considered.

Applications, statir
ing 2 referees, should
Birmingham (Selly
Group No. 25, Grou
Birmingham, 29.

BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 25.

Sorrento and Lordswood Maternity Hospitals, Birmingham

OBSTETRIC HOUS
vacant 1st September,
for the D.Obst.R.C.O.G
Lordswood Maternity
is an A and thereafter a B2 appointment. Salary £250 p.a., plus full residential emoluments, subject to final agreement of the terms and conditions by the Ministry of Health.

Applications should be sent to the Obstetrician, Sorrento Maternity Hospital, Moseley, Birmingham, 13, by 2nd August, 1949.

Canwell Hall Babies Hospital

PÆDIATRIC HOUSE PHYSICI
1st September, 1949. 6 months'
appointment, followed by 3 montl
plus full residen . . . ject to final agreement of
the terms and . . . Ministry of Health. The
Hospital has 64 . . . up to the age of 5 years
and there are 2 . . . In addition to duties at
Canwell Hall the House Physicians attend rounds at Selly Oak Hospital and a Child Welfare clinic once weekly.

Applications should be sent to the Pædiatrician, Canwell Hall Babies Hospital, Sutton Coldfield, Birmingham, by 2nd August, 1949.

BIRMINGHAM. SELLY OAK HOSPITAL. (1181 Beds.) Birmingham (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 25. Required, HOUSE SURGEONS. Present salary £250 p.a., plus residential emoluments, subject to final agreement reached between the profession and the Ministry of Health. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointments will be for 6 months; otherwise for 1 year.

Applications, stating age, experience, and qualifications, with copies of 3 recent testimonials, should be sent to the Medical Superintendent, Selly Oak Hospital, Birmingham, 29.

BEDFORD COUNTY HOSPITAL. Required, House Surgeon (A) or (B2), for the Fracture and Orthopædic Department. Appointment limited to 6 months. Salary £300 p.a., with full residential emoluments. Practitioners holding A posts may apply.

Applications should be submitted immediately to the Group Secretary, St. Peter's Hospital, Bedford.

BEXHILL HOSPITAL. ***Bexhill-on-Sea. Required, 2 House*** SURGEONS (B2) and (A), posts vacant 13th August, 1949. Appointments for 6 months. Salaries within scale £250–£550 p.a., according to period of qualification, with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, to be sent to the Administrator, Bexhill Hospital, Bexhill-on-Sea, Sussex.

H. A. FROGGATT, Secretary,
Hospital Management Committee (Hastings) Group.

BISHOP AUCKLAND. GENERAL HOSPITAL. South-West DURHAM HOSPITAL MANAGEMENT COMMITTEE. ASSISTANT RESIDENT MEDICAL OFFICERS (A) or (B2), Male or
Female, for general medi . . . thopædic,
and geriatric work. Salary . . . an 1 year
£280 p.a. . . . qualifica-
tion £380 . . . oluments
valued for . . . ctitioners
within 3 months of quali . . . ay apply.
Applications should be . . . Medical
Superintendent, General Hospital, Bishop Auckland, co. Durham.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT MMITTEE.

Blackburn Royal Infirmary

REGISTRAR, surgery.
JUNIOR REGISTRAR, medicine.
JUNIOR REGISTRAR, anæsthetics.

Queen's Park Hospital, Blackburn

JUNIOR REGISTRAR, medicine.
JUNIOR REGISTRAR, surgery.

ll the posts are tenable for 1 year. Salaries and conditions s recently published by the Ministry of Health. £100 p.a. [illegible] emoluments are provided. Applica- [illegible] to be called up for military service [illegible]

Applications, stating age, qualifications, nationality, experience, &c., with names of 2 persons for reference, should be sent to ndersigned at the Royal Infirmary, Blackburn.

T. DEWHURST, Secretary.

BLACKPOOL. VICTORIA HOSPITAL. Applications invited from egistered medical practitioners for following resident appointents :—

HOUSE SURGEON (B2), Surgical Unit, vacant 1st September, 1949.

HOUSE SURGEON (B2), Surgical Unit, vacant 24th September, 1949.

These posts are recognised for the F.R.C.S. examinations. ppointments for 6 months. Salary and conditions in accordance ith the new National Health Service terms. R practitioners olding A posts may apply.

Applications, stating age and qualifications, with copies of 3 recent testimonials, should be sent to the Secretary, Blackpool nd Fylde Hospital Management Committee, Victoria Hospital Blackpool.

BOSCOMBE. ROYAL VICTORIA HOSPITAL. (440 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Required, 3 HOUSE SURGEONS at above Hospital. Each appointment is for 6 months, 2 to commence 31st July, 1949, and the other on 15th August. Salary £350 p.a., from which will be deducted £100 for full residential emoluments. Appointments recognised for the F.R.C.S. examination.

Applications, stating age, qualifications, nationality, and whether married or single, with copies of 3 recent testimonials, to be addressed to the Administrator of the Hospital immediately.

BOLTON ROYAL INFIRMARY. (250 Beds—Resident Medical Staff of 8.) Required, HOUSE SURGEON (A), Male or Female. Appointment for 6 months, and salary in accordance with the new terms and conditions of service for hospital medical and dental staff. R practitioners, eligible for service with H.M. Forces or under 25½ years not having held an A post, considered.

Applications, stating age, nationality, and experience, with copies of testimonials, to be forwarded immediately to—

H. P. TRAVIS, Secretary,
Bolton and District Hospital Management Committee.

BOLTON. TOWNLEYS HOSPITAL. (510 Beds.) Required, RESIDENT JUNIOR HOUSE OFFICER (B2), to assist in general surgery, post vacant immediately. Appointment for 6 months. Salary in accordance with the new terms and conditions of service for hospital medical and dental staff.

Applications, stating age, nationality, experience, and names of 2 persons for reference, should be forwarded to undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Secretary,
Bolton and District Hospital Management Committee.

BOLTON. TOWNLEYS HOSPITAL. (510 Beds.) Required, RESIDENT JUNIOR HOUSE OFFICER (B2), to assist in obstetrics, vacant immediately. The Hospital is officially recognised for the D.Obst.R.C.O.G. Examination. Appointment for 6 months, with salary in accordance with the new terms and conditions of service for hospital medical and dental staff.

Applications, stating age, nationality, experience, and names of 2 persons for reference, should be forwarded to undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Secretary,
Bolton and District Hospital Management Committee.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. (105 Beds.) Male HOUSE OFFICER (E.N.T.) required for 6 months, commencing 1st August, 1949. Salary £350–£450 p.a. according to experience, less a deduction of £100 p.a. for board and lodging. R practitioners within 3 months of qualification or holding A posts may apply.

Applications, stating age, nationality, qualifications, and experience, with copies of testimonials, should be forwarded to undersigned at the Royal Infirmary, Bradford.

H. TRUSSON, Secretary,
Bradford A Group Hospital Management Committee.

BRADFORD. ST. LUKE'S HOSPITAL. (1050 Beds.) Resident HOUSE OFFICER (Orthopædic Department) required for 6 months, post now vacant. Salary £350–£450 p.a., according to experience, less a deduction of £100 p.a. for residential emoluments. R practitioners within 3 months of qualifying or holding A posts may apply.

Applications, stating age, nationality, qualifications, and experience, should be forwarded to undersigned at the Royal Infirmary, Bradford. H. TRUSSON, Secretary,
Bradford A Group Hospital Management Committee.

BRADFORD ROYAL INFIRMARY. (510 Beds.) Resident Anæs-THETIST (Junior Registrar) required for 12 months, post now vacant. Salary £670 p.a., less a deduction of £100 p.a. for board and lodging. Applications from practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, should be forwarded to undersigned at the above Hospital.

H. TRUSSON, Secretary,
Bradford A Group Hospital Management Committee.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. Brighton AND LEWES HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (B2) required, post vacant 1st September, 1949. Salary £200 p.a., with full residential emoluments. Post limited to 6 months in the case of R practitioners.

Applications, with copies of 3 recent testimonials, should be received by the Administrative Officer, Royal Sussex County Hospital, Brighton, 7, by 2nd August, 1949.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. Brighton AND LEWES HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (B2) required, post vacant 1st September, 1949. Salary £200 p.a., with full residential emoluments. Post limited to 6 months in the case of R practitioners.

Applications, with copies of 3 recent testimonials, should be received by the Administrative Officer, Royal Sussex County Hospital, Brighton, 7, by 2nd August, 1949.

BRIGHTON. THE ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN. (126 Beds.) BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (B2). 6 months' appointment from 1st September, 1949. Salary £200 p.a., with full residential emoluments. The Hospital is recognised for the D.C.H. Diploma and M.D. Examination, Branch 1.

Applications, stating age, qualifications with dates, and nationality, with copies of recent testimonials, should be sent to the Administrative Officer on or before the 1st August.

BRISTOL CLINICAL AREA. South Western Regional Hospital BOARD. A LOCUM TENENS is required to assist in the Chest Clinics in Bristol for a period of 4 months. Experience in general medicine and diseases of the chest, including pulmonary tuberculosis, is essential. Salary 18 guineas per week.

Applications should be addressed to the Secretary, South Western Regional Hospital Board, 5–6, Cotham Lawn-road, Bristol, 6.

BRISTOL ROYAL HOSPITAL. United Bristol Hospitals. Appli-cations invited from registered medical practitioners for following resident appointments for the 6 months commencing 1st September, 1949. Provisional salaries, subject to review, £150 p.a. for A posts and £200 p.a. for B2 posts, with full residential emoluments. Applicants for A posts should be within 3 months of qualification; those for B2 posts should now be holding A posts :—

Infirmary Branch

ORTHOPÆDIC HOUSE SURGEON.

General Hospital Branch

E.N.T. HOUSE SURGEON.

RADIOTHERAPY HOUSE SURGEON who will have house charge of approximately 70 Beds with particular reference to general medicine: radiotherapy teaching will be conducted on these beds.

Applications on forms obtainable from undersigned should be returned immediately to—

STEPHEN C. MERIVALE, Secretary to the Board.
Royal Infirmary Branch, Bristol, 2.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COM-MITTEE. Applications invited for under-mentioned posts at the 3 main hospitals and the infectious diseases hospital of this group of 10 hospitals with 1687 Beds.

Bury General Hospital, Bury, Lancs (an acute general hospital of 161 Beds—mainly surgical with beds for orthopædic and other specialties and with a Maternity Department of 11 Beds)

JUNIOR ANÆSTHETIC REGISTRAR, resident or non-resident.

JUNIOR ORTHOPÆDIC REGISTRAR, resident or non-resident.

HOUSE SURGEON (Casualty, Eye, and E.N.T.), resident.

Fairfield General Hospital, Bury, Lancs (a general hospital of 679 Beds, mainly chronic sick with beds for acute medical cases, and a Maternity Department of 55 Beds for normal and abnormal cases of upwards of 1000 annually)

JUNIOR OBSTETRIC REGISTRAR, resident or non-resident.

Fairfield General and Bury General Hospitals

JUNIOR MEDICAL REGISTRAR, resident or non-resident, to be responsible for medical cases between the 2 Hospitals.

Rossendale General Hospital, Rawtenstall, Lancs (a general hospital of 525 Beds mainly chronic sick with beds for acute medical cases and a Maternity Department of 25 Beds)

JUNIOR OBSTETRIC REGISTRAR, resident or non-resident.

Florence Nightingale Hospital, Bury, Lancs (an infectious diseases hospital of 120 Beds)

HOUSE PHYSICIAN, resident, to be responsible for the cases of infectious diseases in the hospital but also certain duties in connexion with medical cases in Bury General Hospital.

Salaries, &c., in accordance with terms and conditions of service for Hospital Medical and Dental Staff (England and Wales)—viz., Registrars £670 p.a., non-resident (with deduction of £100 where the post is resident); House Officers £350–£450 p.a., according to experience (with deduction of £100 p.a. for board, &c.). Tenure of appointment: Registrars 1 year; House Officers 6 months.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 testimonials, should be forwarded immediately to undersigned from whom further particulars can be obtained. H. WILKINSON, Secretary to the Committee.
Bury General Hospital, Walmersley-road, Bury, Lancs.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) Required, HOUSE SURGEON (A) for E.N.T. and General Surgical Department. Salary £200 p.a. Appointment normally for 6 months. R practitioners within 3 months of qualification may apply.

Applications to Secretary, West Suffolk Hospital Management Committee, 36, Mill-road, Bury St. Edmund's.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds). Required, RESIDENT ANÆSTHETIST (A) or (B2). Salary £200 or £250 p.a. Appointment normally for 6 months. R practitioners within 3 months of qualification may apply. Hospital recognised for the D.A.

Applications to Secretary, West Suffolk Hospital Management Committee, 36, Mill-road, Bury St. Edmund's.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) Required, HOUSE SURGEON (B2) for Gynæcological and Obstetrical Department. Appointment normally for 6 months. Salary £250 p.a.

Applications to Secretary, West Suffolk Hospital Management Committee, 36, Mill-road, Bury St. Edmund's.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Required, House SURGEON (B2), Male or Female, to the Department of Oto-laryngology, post vacant 16th August, 1949. Appointment limited to 6 months. Salary £200 p.a., with full residential emoluments, subject to review when the terms and conditions of service have been finally agreed and implemented. R practitioners holding A posts may apply.

Applications, with copies of 3 recent testimonials, should be sent by 1st August, 1949, to J. A. BEARDSALL, Secretary.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Required, House SURGEON (A), Male or Female, post vacant 1st September, 1949. Appointment for 6 months. Salary £130 p.a., with full residential emoluments, subject to review when the Spens report becomes operative. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, stating age, qualifications with dates, and nationality, with copies of 3 recent testimonials, should be sent by 3rd August, 1949, to— J. A. BEARDSALL, Secretary,
The United Cambridge Hospitals.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (134 Beds.) Required, HOUSE SURGEON (A), Male or Female. Appointment for 6 months. Salary in accordance with the recommendations of the Spens report ranging from £250–£350 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications to be sent to—
A. W. YOUNGS, Secretary,
West Wales Hospital Management Committee.

CHATHAM. ALL SAINTS' HOSPITAL. (416 Beds.) Medway AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (A) required 1st August, 1949. Salary £200 p.a., with full residential emoluments. To R practitioner appointment limited to 6 months.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials, to be forwarded immediately to the Surgeon-Superintendent.

CHELMSFORD. ST. JOHN'S HOSPITAL. Maternity Department. (65 Beds.) TEMPORARY SENIOR OBSTETRIC OFFICER required for approximately 4 months, to commence 5th August. Salary £750 p.a., including emoluments.

Apply, Secretary, Hospital Management Committee—Chelmsford Group, c/o Chelmsford and Essex Hospital, Chelmsford.

CHELTENHAM. SUNNYSIDE MATERNITY HOSPITAL. Required, RESIDENT OBSTETRIC OFFICER (B2), post vacant 6th August, 1949. The Hospital, which is recognised for the purpose of training for the D.Obst.R.C.O.G., has 63 Beds and deals with the majority of abnormal midwifery cases in North Gloucestershire. Appointment for 6 months and commencing salary £400 p.a. with a deduction at rate of £100 p.a. in respect of board and lodging and other services provided. R practitioners holding A posts may apply.

[illegible] age, qualifications, and experience, with [illegible]monials, should be sent to the Secretary, [illegible] Group Management Committee, General

CHICHESTER, SUSSEX. ST. RICHARD'S HOSPITAL. Required, CASUALTY OFFICER (B2), Male or Female. Primarily appointee will be expected to work in the Admission Ward of the Hospital, but may be called upon to undertake anæsthetics and other duties if requested by the Surgeon-Superintendent. Hours of duty from 10 A.M.–6 P.M. Salary £325 p.a., with full residential emoluments.

Applications, stating age, qualifications, and experience, and giving names of 2 persons to whom reference may be made, should be sent to the Surgeon-Superintendent, immediately.

CHICHESTER, SUSSEX. ST. RICHARD'S HOSPITAL. (400 Beds.) Required, HOUSE SURGEON (A), for 6 months only in the first instance. Salary £250 p.a., full residential emoluments. The Man or Woman appointed will work primarily in the surgical wards of the Hospital, but must be prepared to undertake other work if requested by the Surgeon-Superintendent.

Applications, stating age, qualifications, and experience, and giving names of 2 persons to whom reference may be made, should be sent to the Surgeon-Superintendent immediately.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. Required, HOUSE SURGEON (A), vacant 9th August for 6 months. Salary £350 p.a., less £100 emoluments.

Applications, with testimonials, should be made to the Secretary.

COLCHESTER. ESSEX COUNTY HOSPITAL. (207 Beds.) Required, HOUSE OFFICER (A) or (B2), first, second, or third post (Casualty Officer and Anæsthetist). Appointment tenable for 6 months, to commence immediately. Salary in accordance with terms and conditions of service of hospital medical and dental staff. R practitioners within 3 months of qualification or holding A posts may apply.

Applications should be forwarded as soon as possible to—
ERNEST R. HANCHET, Secretary,
Colchester Group Hospital Management Committee.
14, Pope's-lane, Colchester.

CARDIFF. WHITCHURCH HOSPITAL. House Physicians (B2), Male or Female, required. Opportunities exist in this teaching hospital for gaining experience in all branches of psychiatry, including neuroses, psychoses, child psychiatry, and methods of neuropsychiatric research. Salary ranging from £350 p.a. for first post to £450 p.a. for third or any subsequent post, with deduction of £100 p.a. for board and lodging. Appointment for 6 months which may be renewable except in the case of R practitioners holding A appointments.

Forms of application obtainable from the Physician-Superintendent, to whom they should be returned with names of 2 referees.

CLACTON AND DISTRICT HOSPITAL, Clacton-on-Sea, Essex. *Required, HOUSE SURGEON (A). Appointment for 6 months.* Salary £350 p.a., with a deduction of £100 p.a. in respect of residential emoluments. R practitioners within 3 months of qualification may apply.

Applications, with copies of 2 recent testimonials, should be *forwarded to the Secretary of the Hospital.*
ERNEST R. HANCHET, Secretary,
Colchester Group Hospital Management Committee.
14, Pope's-lane, Colchester.

COVENTRY GROUP NO. 20 HOSPITAL MANAGEMENT COMMITTEE. Applications invited for under-mentioned posts:—

Coventry and Warwickshire Hospital

HOUSE SURGEON (A) or (B2) to the Ophthalmic Department. Appointment for 6 months. Salary £250–£350 p.a., resident. Hospital recognised for training for the D.O.M.S.

HOUSE SURGEON (A) or (B2) to General Surgical Departments. Appointment for 6 months. Salary £250–£350 p.a., according to experience, with full residential emoluments.

HOUSE SURGEON, Male or Female, to Central Accident Unit. Salary £250–£350, resident.

JUNIOR REGISTRAR, Central Accident Unit. Appointment for 12 months. Salary £570 p.a., resident.

Coventry. Gulson Hospital

HOUSE SURGEON (A) or (B2). Appointment for 6 months. Salary £250–£350 p.a., resident.

Nuneaton. George Eliot Hospital (late Emergency Hospital)

HOUSE SURGEON (B2), vacant mid-July. *Appointment for* 6 months. Salary £300–£350 p.a., according to experience, resident.

Rugby. Hospital of St. Cross

RESIDENT SURGICAL OFFICER (B1), vacant 24th August. Salary, provisionally, £600 p.a., resident. Applicants with a higher qualification preferred. Appointment for 12 months in the first instance.

Applications, stating full details as to age, nationality, qualifications, and experience, whether married or single, with co[illegible] should be addressed to the Se[illegible] nagement Committee, at *Co*[illegible]

CREW. [illegible] to [illegible] an [illegible] Sa [illegible] ins [illegible] tions, with 2 recent testimonials, should be sent to undersigned at Crewe Memorial Hospital, Victoria-avenue, Crewe.
H. K. GWILLIAM, Secretary,
South Cheshire Hospital Management Committee.

DORCHESTER. DORSET COUNTY HOSPITAL. Required, HOUSE SURGEON (B2), Male, post vacant mid-July. Appointment tenable for 6 months. Appropriate Ministry of Health salary scale in accordance with experience, less £100 p.a. for residential emoluments.

Applications, giving age, qualifications, and nationality, with experience and copies of testimonials, to be sent immediately to the Secretary, West Dorset Group Hospital Management Committee, Dorchester, Dorset.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE. House PHYSICIAN (Female) (B2) required for Group Medical Staff. Appointment *limited to 6 months. Salary £400 a year, with* deductions at rate of £100 a year in respect of full residential emoluments provided. Appointee will be resident at the Bow Arrow Isolation Hospital, and be required to undertake duties also at The River Hospitals, Joyce Green (general).

[illegible] age, qualifications, experience, and [illegible] sent to the Secretary, Dartford Hospital [illegible] Room No. 21, The Bow Arrow Hospital, Dartford, Kent.

DARTFORD. THE SOUTHERN HOSPITAL. House Surgeon required. Appointment limited to 6 months. Salary £350 a year, with deductions at rate of £100 a year in respect of full residential emoluments provided. R practitioners, ineligible for H.M. Forces or under 25½ years of age not holding an A post, *considered.*

Applications, stating age, qualifications, experience, nationality, and names of 2 persons to whom reference may be made, should be addressed to the Secretary, Dartford Hospital Management Committee, Room No. 21, The Bow Arrow Hospital, Dartford, Kent.

DARTFORD. THE WEST HILL HOSPITAL. House Surgeon required. Appointment limited to 6 months. Salary £350 a year, with deductions at rate of £100 a year, in respect of full residential emoluments provided. The Hospital is a large general hospital providing excellent clinical material and experience; it is close to the station, with an excellent train service to London, within 16 miles distance. R practitioners, ineligible for H.M. Forces or under 25½ years of age not holding an A post, considered.

Applications, stating age, qualifications [illegible] nationality, and names of 2 persons to [illegible] be made, should be sent to the Secretary, [illegible] agement Committee, Room No. 21, The [illegible] Dartford, Kent.

DARTFORD. THE WEST HILL HOSPITAL. Casualty Officer required. Appointment limited to 6 months. Salary £350 a year, with deductions at rate of £100 a year, in respect of full residential emoluments provided. The Hospital is a large general hospital providing excellent clinical material and experience; it is close to the station, with an excellent train service to London, within 16 miles distance. R practitioners, ineligible for H.M. Forces or under 25½ years of age not holding an A post, considered.

Applications, stating age, qualifications, experience, nationality, and names of 2 persons to whom reference may be made, should be sent to the Secretary, Dartford Hospital Management Committee, Room No. 21, The Bow Arrow Hospital, Dartford, Kent.

DONCASTER. ST. CATHERINE'S INSTITUTION. Required, JUNIOR REGISTRAR (Male or Female) at above Mental [illegible] 530 Beds. Salary £670 p.a., less charge [illegible] A small bachelor flat will be available. [illegible] age, nationality, qualifications, and experience, [illegible] be sent to the [illegible] mittee, c/o [illegible] 9.

DONCASTER ROYAL [illegible] the regulations for the D.A.) Required, RESIDENT ANÆSTHETIST (B1). Salary £350, £400, or £450 p.a. (according to qualifications, experience, and previous positions held), from which a deduction at rate of £100 p.a. will be made for board, residence, &c. Applications from practitioners holding B1 posts cannot be considered [illegible] H.M. Forces.

Applications, stating age, [illegible] ity, and present post, with copi[illegible] be sent immediately to—

A. JONES, Secretary,
Doncaster Hospital Management Committee.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Required, HOUSE SURGEON (A). Salary £350 p.a., from which a deduction at rate of £100 p.a. will be made for board, residence, &c. R practitioners, ineligible for H.M. Forces or under 25½ years not having held an A post, considered.

Applications, stating age, qualifications with dates, nationality, and present post, with copies of 3 recent testimonials, should be forwarded immediately to—

A. JONES, Secretary.
Doncaster Hospital Management Committee.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Required, HOUSE PHYSICIAN (A). Salary £350 p.a., from which a deduction at rate of £100 p.a. will be made for board, residence, &c. R practitioners, ineligible for H.M. Forces or under 25½ years not having held an A [illegible]

Applications, stating age, [illegible] onality, and present post, with co[illegible] should be forwarded immediately to—

A. JONES, Secretary.
Doncaster Hospital Management Committee.

DONCASTER ROYAL INFIRMARY. Required, Casualty Officer (B1), Male. Salary £350, £400, or £450 p.a. (according to qualifications, experience, and previous positions held), from which a deduction at rate of £100 p.a. will be made for board, residence, &c. This large industrial area offers excellent opportunities for gaining experience.

[illegible] qualifications with dates, nationality, an[illegible] copies of 3 recent testimonials, should be se[illegible]

A. JONES, Secretary.
Doncaster Hospital Management Committee.

DOUGLAS, ISLE OF MAN. NOBLE'S HOSPITAL. Required, 2 HOUSE SURGEONS (A) in up-to-date Hospital expanded to 150 Beds and with the usual ancillary departments. Serves Island population of 50,000 and large visiting influx in summer. Residential salary £250 p.a., with full residential emoluments. Posts will provide ample and varied experience in pleasant surroundings. Term of office 6 months in first instance.

Applications, with copies of 2 recent testimonials, to the Secretary, Medical Staff Committee, Noble's Hospital, Isle of Man.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION. Applications invited from registered medical practitioners with experience in tuberculosis work for appointment of ASSISTANT TUBERCULOSIS OFFICER which will be held in the Dudley and South Staffs Area. Salary scale £700 p.a., by annual increments of £50 to maximum of £1000 p.a. Travelling allowances will be granted in accordance with the Regional Hospital Board's scale. Appointment which will be terminable by 1 month's notice on either side, will also be subject to the provisions of the National Health Service (Superannuation) Regulations, 1947/48, in which connexion successful candidate will be required to pass a medical examination and produce his or her birth certificate.

Applications, giving details of experience, with copies of 3 recent testimonials, should be forwarded to H. RAYMOND HURST, Secretary to the Management Committee, The Guest Hospital, Dudley, Worcs.

DUDLEY. THE GUEST HOSPITAL. (154 Beds.) Dudley, Stourbridge and District Hospital Group, Birmingham Region. Required, RESIDENT SURGICAL OFFICER (B1), post vacant 1st August, 1949. Applicants should have held house appointments and had surgical experience. Preference given to candidates holding the Fellowship of one of the Royal Colleges. Post will be of Registrar status and salary at rate prescribed by the Minister for the appropriate grade. A deduction of £100 p.a. in respect of residential emoluments will be made. Period of post will be in accordance with the grade. Applications from R practitioners holding B1 posts cannot be considered unless they are ineligible for H.M. Forces.

Applications, stating age, nationality, qualifications with dates, experience, and details of p[illegible] copies of 3 recent testimonials, to H. [illegible] to the Management Committee, The [illegible]

DUDLEY. THE GUEST HOSPITAL. (154 Beds.) Dudley, Stourbridge and District Hospital Group, Birmingham Region. Required, CASUALTY OFFICER (B2), post vacant 8th August, 1949, and will be tenable for 6 months. Post will be House Officer status and salary at rate of £350 p.a.–£450 p.a., according to the number of posts previously held. A deduction of £100 p.a. in respect of residential emoluments will be made. R practitioners within 3 months of qualification or holding A posts may apply.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, with copies of 3 recent testimonials, to H. RAYMOND HURST, Secretary to the Management Committee, The Guest Hospital, Dudley.

DEVONPORT. ALEXANDRA MATERNITY HOME. (50 Beds.) Required, RESIDENT MEDICAL OFFICER (B2), post vacant 12th August, 1949. Salary £200 p.a., with full residential emoluments. R practitioners holding A posts who have not completed a 5 months' tenure of those posts may apply, when appointment will be limited to 6 months.

Applications, stating age, nationality, qualifications, and experience, with 3 recent testimonials, should be sent to—

ARTHUR R. CASH, Secretary,
The Plymouth, South Devon and East Cornwall
General Hospital Management Committee.
c/o South Devon and East Cornwall Hospital,
Greenbank-road, Plymouth.

AMENDED ADVERTISEMENT

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. Required, REGISTRAR (B1), resident, Department of Anæsthetics. Candidates should have good experience in modern methods of anæsthesia. General scope of duties arranged by Medical Director and Senior Anæsthetist and may include teaching. Salary and conditions as negotiated less £100 p.a. for residence. Appointment subject to National Health Service (Superannuation) Regulations, 1947/48, and unless a transferred officer, [illegible] 1 month's notice is necessary [illegible] holding B1 posts cannot be [illegible] H.M. Forces.

[illegible] 3 referees, to the Secretary, by [illegible]

EDGWARE GENERAL (formerly Redhill County) HOSPITAL, EDGWARE, MIDDLESEX. Required, RESIDENT HOUSE PHYSIC[illegible] 1949. Salary £400–£450 p.[illegible] of £100 p.a. for board, lo[illegible] rminable by 1 month's n[illegible] cannot be considered u[illegible]

[illegible] ce, and e[illegible] Medical D[illegible] selected f[illegible]

E[illegible] County) HOSPITAL, E[illegible] RESIDENT HOUSE SURGEONS (B2), posts vacant 1st September, 1949. Salary £400–£450 p.a., according to experience, deduction of £100 p.a. for board, lodging, &c. 6 months' appointment terminable by 1 month's notice. Practitioners holding B2 posts cannot be considered u[illegible] for H.M. Forces.

Applicati[illegible] and enclosing u[illegible] Medical Director of [illegible] elected for intervie[illegible]

EDGWARE GENERAL (formerly Redhill County) HOSPITAL, EDGWARE, MIDDLESEX. Required, RESIDENT CASUALTY OFFICER (B2), post vacant 1st September, 1949. Salary £400–£450 p.a., according to experience, deduction of £100 p.a. for board, lodging, &c. 6 months' appointment terminable by 1 month's notice. Practitioners holding B2 posts cannot be considered unless ineligible for H.M. Forces.

Applications, stating age, qualifications, experience, and enclosing up to 3 copies of recent testimonials, to Medical Director of Hospital by 6th August, 1949. Candidates selected for interview will be notified by 13th August, 1949.

EXETER. PRINCESS ELIZABETH ORTHOPÆDIC HOSPITAL. (150 Beds with Annexe.) EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (B2), Male, post vacant end of August, 1949. Appointment for 6 months. Salary £250 p.a., with full residential emoluments. R practitioners eligible for H.M. Forces holding A posts not considered.

Applications, with copies of 3 recent testimonials, should be sent to the Senior Administrative Officer, Princess Elizabeth Orthopædic Hospital, Buckerell Bore, Exeter, Devon.

FARNBOROUGH HOSPITAL. *(776 Beds.) Bromley Group* HOSPITAL MANAGEM[illegible] [illegible]ications invited from suitably qualified [illegible] actitioners (Male or Female) for the follo[illegible] Officer appointments at above-named Hospital:—

(*a*) 3 HOUSE PHYSICIANS. Duties to include assistance in cardiology (A), outpatient (A), and chest clinics (B2). Chest experience an advantage for one appointment.

(*b*) 3 HOUSE SURGEONS (A). Appointment recognised for final F.R.C.S.

(*c*) HOUSE SURGEON (B2) for obstetric and gynæcological duties. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G.

(*d*) HOUSE PHYSICIAN (B2), pædiatric. Recognised for the D.C.H.

(*e*) HOUSE SURGEON (A) for E.N.T. duties. Recognised for D.L.O.

Salaries £200 a year, plus cost-of-living bonus and residential emoluments, subject to [illegible] ccordance with national scales. R [illegible] qualification may apply for A [illegible] t August 1949.

Applications to be addressed to the Surgeon-Superintendent, Farnborough Hospital, Farnborough, Kent, as soon as possible.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Enfield GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (B2), required 1st August, 1949, for general surgical duties. Post, which is tenable for 6 months, is recognised for the F.R.C.S. Appointment of House Officer status and salary at rate of £350–£450 p.a., according to the number of posts previously held. A deduction of £100 p.a. in respect of residential emoluments will be made. R practitioners holding A posts may apply. Whole-time duties such as Hospital may require, under supervision of Medical Director.

Applications, stating age, nationality, qualifications, and experience, with names of 2 referees, to the Medical Director of the Hospital immediately.

GRAVESEND AND NORTH KENT HOSPITAL. Medway and GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (A), post vacant 1st August, 1949. Salary £200 p.a., with full residential emoluments. To R practitioner post limited to 6 months.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials, to be forwarded to the Administrative Officer as soon as possible.

GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications invited from registered medical practitioners for following resident appointments at hospitals in the group. Appointments are for 6 months unless otherwise stated and subject to terms and conditions of service of Hospital Medical and Dental Staff (England and Wales).

Grimsby General Hospital (220 Beds)

HOUSE OFFICER (A) or (B2) for duty with Special Departments—i.e., E.N.T. and Gynæcology. Hospital approved for D.L.O.

HOUSE OFFICER (A) or (B2), orthopædic, for Fracture and Accident Service. Previous surgical experience an advantage, but orthopædic experience not essential. Post suitable for commencement of training in orthopædics and fractures with opportunity for operative experience.

HOUSE OFFICER (A) or (B2), surgical, Male or Female.

JUNIOR REGISTRAR (B1), Casualty Department. Appointment for 1 year. R practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces.

Scartho Road Infirmary, Grimsby (378 Beds)

HOUSE OFFICER (A) or (B2), surgical.

HOUSE OFFICER (A) or (B2), medical.

Louth County Infirmary

HOUSE OFFICER (A) or (B2), surgical.

HOUSE OFFICER (A) or (B2), medical.

Applications to the Secretary, Grimsby Hospitals Management Committee, 13, Queen's-parade, Grimsby.

HARROGATE AND DISTRICT GENERAL HOSPITAL. (253 Beds —recognised by the R.C.S. for Final F.R.C.S. examination requirements.) Required, HOUSE SURGEON (A), post vacant immediately. Salary £350–£450 in the scale for House Officers under the National Health Service. Practitioners within 3 months of qualification may apply, when appointment will be for 6 months.

Applications as soon as possible to the Assistant Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. Required, HOUSE PHYSICIAN (A), post vacant 22nd August, 1949. Appointment for 6 months. Salary within scale £250–£550 p.a., according to period of qualification, with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications to be sent to the Administrator, Royal East Sussex Hospital, Hastings.

H. A. FROGGATT, Secretary,
Hospital Management Committee (Hastings Group).

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (130 Beds.) Required, RESIDENT SURGICAL OFFICER (B1), post now vacant. 2 other Resident Medical Staff. Salary £450 p.a., with full residential emoluments. R practitioners eligible for H.M. Forces holding B1 or A posts not considered.

Applications in writing, stating age, qualifications, and experience, with copies of 3 testimonials, to be sent immediately addressed to the Secretary-Superintendent, Pembroke County War Memorial Hospital, [illegible]

[illegible] Committee.
West Wal[illegible]

HALIFAX AREA HOSP[illegible] MANA[illegible] COMMITTEE. Required, HOUSE PHY[illegible] le or Female. Appointee required t[illegible] each day at St. John's Hospital, [illegible] ent accommodates 400 aged sick and [illegible] Hospital is being developed and is alrea[illegible] ultant medical and ancillary services. Tl[illegible] ll be responsible to the Medical Registrar-[illegible] re at this Hospital, but who also underta[illegible] Halifax Infirmary —and to the Visiting Consultants. Appointee may be required to undertake relief duties at the Royal Halifax Infirmary which is a hospital for acute sick patients with a busy Outpatients' Department. Residence in the first instance may be at the Royal Halifax Infirmary, but will ultimately be at St. John's Hospital.

Applications, stating age, sex, nationality, qualifications, and experience, and containing names and addresses of 3 persons from whom testimonials can be obtained, to be forwarded to R. W. RANSON, The Secretary, Halifax Area Hospitals Management Committee, Royal Halifax Infirmary.

HALIFAX GENERAL HOSPITAL. (425 Beds—Resident Medical Staff 11.) HOUSE SURGEON (B2), Male or Female, to the Special Departments, post vacant immediately. Salary within the range £250–£350 p.a., according to experience, with full res[illegible] ppointment for 6 months, renewable. [illegible] ge, sex, nationality, qualifications, an[illegible] ies of 3 recent testimonials, to be ad[illegible], Halifax Area Hospitals Management Committee, Royal Halifax Infirmary, Halifax.

HALIFAX GENERAL HOSPITAL. (425 Beds.) Required, Ho PHYSICIAN (B2). Salary within range of £250–£350 p plus full residential emoluments. R practitioners eligible H.M. Forces holding A post not considered.

Applications, stating age, nationality, qualifications, experience, with copies of 3 recent testimonials, to be addre to the Secretary, Halifax Area Hospitals Management Co mittee, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (Resident Staff SECOND HOUSE SURGEON and THIRD HOUSE SU GEON (A) or (B2), Male or Female, now vacant. 6 month posts. Salary for newly qualified practitioners £250 p.a.; aft 6 months' previous experience £300 p.a.; after 12 month previous experience £350 p.a.; with full residential emolument R practitioners eligible for H.M. Forces holding A post n considered.

Applications, stating age, sex, nationality, qualifications, a experience, and enclosing copies of 3 testimonials, should sent to the Secretary, Halifax Area Hospitals Manageme Committee, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (298 Beds—Reside Medical Staff, 7.) Applications invited for following appoin ments:—

HOUSE PHYSICIAN (B2), Male.

RESIDENT ANÆSTHETIST (B2).

Salary within range of £250–£350 p.a., plus full residenti emoluments. R practitioners eligible for H.M. Forces holdi A post not considered.

Applications, stating age, nationality, qualifications, a experience, with copies of 3 recent testimonials, to be address to the Secretary, Halifax Area Hospitals Management Committe Royal Halifax Infirmary, Halifax.

HEREFORD. THE GENERAL HOSPITAL. (154 Beds.) Herefor SHIRE HOSPITAL MANAGEMENT COMMITTEE. Immediate applic tions invited from registered medical practitioners for appoin ment of HOUSE SURGEON (A) in charge of Casualty, E.N.T and Fracture Departments. R practitioners within 3 months qualification and liable under the National Service Acts ma apply. Appointment will be limited to 6 months and salar at rate of £250 p.a., with full residential emoluments.

Applications, with copies of recent testimonials, should sent to T. W. UPTON, Secretary.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. Applic tions invited from registered medical practitioners who have he house appointments and had good all-round experience for po of RESIDENT CASUALTY OFFICER (B1), Male, immedia vacancy. Salary in accordance with new terms and conditions hospital medical staff for junior hospital medical officers. Whol time duties, under Medical Director, will include dealing wi casualties and admissions to Hospital and such other duties may be required. Appointment for period not exceeding months. R practitioners eligible for H.M. Forces holding posts not considered.

Applications, stating age, nationality, qualifications, a experience, and enclosing copies of 1–3 recent testimonia to Medical Director of Hospital.

HILLINGDON HOSPITAL, Hillingdon, near Uxbridge, Middlese CHIEF ASSISTANT to the Thoracic Surgeon required, po vacant early August. Candidates are expected to possess t higher qualification in surgery, with experience in thorac surgery and ability to undertake general emergency surger [illegible]. Gener Post provides good experience i[illegible] alary scope of duties arranged by [illegible] medic accordance with new terms and [illegible] uccessf staff for Senior Registrar. Post [illegible] candidate must live near Hospital.

Applications, stating age, nationality, qualifications, a experience, and enclosing copies of 1–3 recent testimonial should be sent to the Medical Director of the Hospital 27th July, 1949.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. West Her GROUP HOSPITAL MANAGEMENT COMMITTEE. CASUALT OFFICER AND HOUSE SURGEON (A) or (B2). 6 months appointment as from 31st August, 1949. Salary £200 p.a. A, o between £300 and £350 B2, with full residential emoluments

Applications, giving full details, should be sent as soon as possible to the Administrator at the Hospital.

HITCHIN, HERTS. NORTH HERTS AND SOUTH BEDS HOS PITAL MATERNITY UNIT. (42 Beds, together with a 24-Be annexe—Foxholes Maternity Home.) Required, RESIDEN OBSTETRICAL OFFICER (B1), post now vacant. Previou experience in this specialty is essential and preference given candidates with higher qualification. Appointment will recognised for the D.Obst.R.C.O.G. Salary £150 p.a., with fu residential emoluments. Appointment for 6 months in th *first instance. Applications from practitioners holding* B appointments cannot be considered unless ineligible for H. Forces.

Applications, stating age, nationality, qualifications, an experience, with copies of 3 recent testimonials, should be se immediately to the Administrative Officer, North Herts an South Beds Hospital, Hitchin, Herts.

HITCHIN, HERTS. THE LISTER HOSPITAL. Required, Hou SURGEON (A), post vacant 15th July, 1949. Salary £200 p. with full residential emoluments. Practitioners within 3 month of qualification and liable under the National Service Ac may apply, when appointment is for 6 months.

Applications, with copies of 3 recent testimonials, should b sent to the Medical Superintendent.

HITCHIN, HERTS. LISTER HOSPITAL. Pathology Departmen TECHNICIAN required in this area laboratory. Applicant should hold Associateship of the I.M.L.T. Special interest i biochemistry desirable. Salary according to J.N.C. scal Present staff 3 Student Technicians.

Applications, stating age, experience, and names of 2 referee to the Pathologist.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) Huddersfield Hospital Management Committee. RESIDENT ANÆSTHETIST AND ASSISTANT CASUALTY OFFICER (A) required to commence duty 15th August, 1949. Salary £250, with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months.

Applications, with copies of 3 recent testimonials, should be sent as soon as possible to H. J. Johnson, Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) Huddersfield Hospital Management Committee. CASUALTY OFFICER (B2) required to commence duties immediately. Salary £300 p.a., with full residential emoluments. R practitioners holding A posts may apply, when appointment limited to 6 months.

Applications to be addressed to undersigned immediately, with copies of 3 recent testimonials.

H. J. Johnson, Secretary, Huddersfield Royal Infirmary.

HULL A AND B AND EAST RIDING GROUPS HOSPITAL Management Committee. 2 RADIOLOGIST REGISTRARS [illegible] for duties at hospitals under the control of above Committees. Posts will be non-resident and subject to the terms and conditions of hospital medical staff under the National Health Service. Salary for each post £670 p.a.

Applications should be submitted on forms to be obtained from R. J. Carless, Secretary to the Management Committee, Hull Royal Infirmary.

HULL. KINGSTON GENERAL HOSPITAL. (398 Beds.) Required, REGISTRAR ANÆSTHETIST, Male or Female, post vacant now. Salary: first year £775 p.a.; second and subsequent years £890 p.a. If successful candidate is single, living accommodation can be provided, in which case an appropriate deduction for residential emoluments will be made from salary. Suitably qualified practitioners holding B2 appointments are eligible to apply, but applications from R practitioners holding B1 posts cannot be considered unless they are ineligible for H.M. Forces.

Applications should be submitted as soon as possible on forms obtainable from R. J. Carless, Secretary, Hull A Group Hospital Management Committee.

HULL ROYAL INFIRMARY. Required, House Officer (A) or (B2), medical. Post tenable for 6 months and remuneration at rate of £350, £400, or £450 p.a., according to whether it is holder's first, second, or third hospital post, less £100 p.a. in respect of residential emoluments. R practitioners within 3 months of qualification, or holding A posts may apply.

Application forms may be obtained from, and should be returned as soon as possible to, the Administrative Officer, Hull Royal Infirmary.

R. J. Carless, Secretary.
Hull A Group Hospital Management Committee.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street, Hull. Hull A Group Hospital Management Committee. A vacancy will occur on or about 17th August for a RESIDENT HOUSE PHYSICIAN (A), Female. Post tenable for 6 months and remuneration at rate of £350–£450 p.a., according to experience, less £100 residential emoluments. Post will count towards qualification for D.C.H.

Application forms may be obtained from, and should be returned to, the Administrative Officer at the above address as soon as possible. R. J. Carless, Secretary to the Board.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street, Hull. 2 vacancies now occur for RESIDENT HOUSE SURGEONS (A), Female. These posts are each tenable for 6 months and will count towards qualification for D.C.H. Salary £350–£450, according to experience, less £100 residential emoluments.

Application forms obtainable from, and should be returned as soon as possible to, the Administrative Officer at the above address.

R. J. Carless, Secretary,
Hull A Group Hospital Management Committee.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, Keighley. (146 Beds.) Required, SENIOR HOUSE SURGEON (B2), Male or Female, post vacant 19th August, 1949, tenable for 6 months. Salary in accordance with National Health Service terms and conditions of service of hospital medical and dental staff.

Applications, stating age, qualifications, experience, and nationality, to be sent immediately to J. Young, Secretary, Bingley, Keighley, Skipton, and Settle Hospital Management Committee, Keighley Victoria Hospital, Keighley.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. Mid-Worcestershire Hospital Management Committee. Applications invited from registered medical practitioners for following posts:—

HOUSE PHYSICIAN. HOUSE SURGEON.
CASUALTY OFFICER.

First two posts vacant 1st September, 1949, the third post vacant 1st August, 1949. Each post tenable for 6 months. Salary payable in each case £350 p.a., pending settlement of new salary scales. A deduction of £100 p.a. made for residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, with copies of recent testimonials, should be sent at once to the Acting Administrative Officer at the above Hospital.

KETTERING AND DISTRICT GENERAL HOSPITAL. Required, HOUSE SURGEON (B1), with experience in anæsthetics. Salary £300 p.a., plus full emoluments. Hospital recognised for the D.A. [illegible] in the first instance for 6 months. R [illegible] hs of qualification and liable under th [illegible] apply.

[illegible], qualifications, &c., with copies of 1–3 testimonials, should be sent as soon as possible to—

G. H. Fennell, Assistant Secretary.

KETTERING AND DISTRICT GENERAL HOSPITAL. Required, CASUALTY HOUSE SURGEON (B2). Salary £200 p.a., plus full emoluments. Appointment in the first instance for 6 months. R practitioners holding A posts may apply.

Applications, stating age, qualifications, &c., with copies of 1–3 testimonials, should be sent as soon as possible to—

G. H. Fennell, Assistant Secretary.

KIRKBURTON. STORTHES HALL HOSPITAL, Kirkburton, near Huddersfield. Required, JUNIOR HOSPITAL MEDICAL OFFICER (B1), Male or Female. Salary £700, by annual increments of £50 to maximum of £1000 p.a., unfurnished flat available to successful candidate at a rent of £65 p.a. R practitioners eligible for H.M. Forces holding B1 posts not considered.

Applications, stating age, nationality, and giving particulars of psychiatric experience, with names of 3 referees, should be sent as soon as possible to the Medical Superintendent, Storthes Hall Hospital. E. Walsh, Secretary, Hospital
Management Committee, No. 12, Storthes Hall Group.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) Required, RESIDENT CASUALTY OFFICER for 6 months from 1st August, 1949. (This incorporates House Surgeon to the Orthopædic and Traumatic Injury Departments and a small amount of V.D. work.) Post to fill vacancy of B1 grading. £350 p.a., plus full residential emoluments. From 1st September, 1949, grading will be in accordance with National Health Service salaries and conditions.

Applications should be addressed as soon as possible to—

Miss V. Wells, Assistant Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) Required, HOUSE SURGEON (B2) to the Gynæcological and Obstetric Department, vacant immediately. Salary £300 or £350 p.a., according to previous number of appointments held, plus full residential emoluments. This post is recognised for M.R.C.O.G. Examination.

Applications, stating age, qualifications with dates, and details of experience, with copies of recent testimonials, should be sent to Miss V. Wells, Assistant Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) Required, HOUSE SURGEON (A), post now vacant. Salary £250 p.a., plus full residential emoluments. R practitioners within 3 months of qualification may apply, when appointment will be limited to 6 months.

Applications to be sent as soon as possible to—

Miss V. Wells, Assistant Secretary.

LEEDS REGIONAL HOSPITAL BOARD invite applications for appointment of DEPUTY BLOOD TRANSFUSION OFFICER of the Blood Transfusion Service in the Leeds region. Applicants must have been qualified at least 3 years and some previous experience in clinical pathology would be desirable. Headquarters of the service is at the Regional Blood Transfusion Laboratory, Bridle-path, York-road, Seacroft, Leeds. Com- [illegible] Appointment subject to [illegible] the provisions of National [illegible] alations, 1947/48, and to the terms and conditions of service agreed with the Ministry of Health.

Applications, stating age, qualifications, and details of experience, with names of 3 referees, to be forwarded to the Secretary, Leeds Regional Hospital Board, 29/31, Eastgate, Leeds, 2, by 3rd August, 1949. Canvassing in any form, either directly or indirectly, will disqualify.

LEEDS UNITED HOSPITALS AND THE UNIVERSITY OF Leeds. Applications invited from qualified medical practitioners who have held house appointments for the following posts:—

REGISTRARS: Dermatology, 1 vacancy; Neurology, 1 vacancy; Pædiatrics, 1 vacancy; Surgery, 2 vacancies; Anæsthetics, 4 vacancies; Otology, 1 vacancy: Thoracic Surgery, 1 vacancy; Obstetrics and Gynæcology, 1 vacancy.

Grading and salary will be related to qualifications and experience and will conform to the recommendations of the Spens report. Duties will include some teaching but will be mainly clinical. Preference given to candidates who have higher qualifications, especially in filling the posts in neurology, thoracic surgery, and one of the posts in anæsthetics. Candidates holding B1 posts who are ineligible for H.M. Forces may apply.

Applications, stating age, nationality, full details of experience, with names of 3 referees, should be sent by 15th August, to—

S. Clayton Fryers, Secretary to the Board of Governors.

LEEDS UNITED HOSPITALS AND THE UNIVERSITY OF Leeds. Applications invited from medical practitioners possessing a higher qualification for post of SENIOR REGISTRAR AND TUTOR IN PSYCHIATRY. Salary in accordance with the recommendations of the Spens report. Experience of teaching would be an advantage, and successful candidate must satisfy the academic requirements of the University of Leeds. Holders of B1 posts who are ineligible for H.M. Forces may apply.

Applications, stating age, nationality, full details of experience, with names of 3 referees, should be sent by 15th August, to—

S. Clayton Fryers, Secretary to the Board of Governors.

LIVERPOOL EYE, EAR, AND THROAT INFIRMARY. The United Liverpool Hospitals. Applications invited from registered medical practitioners, Male and Female, for B2 posts vacant for 6 months commencing 1st October, 1949, as follows:—

HOUSE SURGEON (eye), non-resident.
HOUSE SURGEON (E.N.T.), non-resident.

Salary £350–£450 p.a., according to experience, in accordance with the nationally agreed terms and conditions of service (House Officers). R practitioners holding A posts may apply.

Applications should be made on forms obtainable from undersigned, to whom they should be returned by 10 A.M. 6th August, 1949.

A. V. J. Hinds, Secretary,
The United Liverpool Hospitals.
80, Rodney-street, Liverpool, 1, 13th July, 1949.

LIVERPOOL AND DISTRICT EASTERN HOSPITAL MANAGEMENT COMMITTEE. Applications invited for following posts, vacant 1st October, 1949 :—

Broadgreen Hospital, Liverpool, 14

Resident appointments :—
HOUSE PHYSICIANS (A) and (B2).
HOUSE SURGEONS (A) and (B2).
OBSTETRIC HOUSE SURGEONS (B2).
HOUSE PHYSICIANS (A) and (B2), Thoracic Unit.
Non-resident appointment :—
ADMISSION ROOM AND CASUALTY OFFICER (B1).

Hours of duty from 9 A.M.–5 P.M. Mondays to Fridays, 9 A.M.–1 P.M. Saturdays. Applications from practitioners holding *B1 posts cannot be considered unless ineligible for H.M. Forces.*

Mill Road Infirmary, Liverpool, 6

RESIDENT OBSTETRIC HOUSE SURGEONS (B2).

Salaries in accordance with the Ministry's scale—i.e., £350 p.a. for first post held, £400 p.a. for second post held, £450 p.a. for third and subsequent posts held. In the case of the resident appointments a sum of £100 p.a. will be deducted in respect of residential emoluments.

Applications, giving full details of qualifications, previous experience, enclosing copies of 2 recent testimonials, and stating clearly the vacancies applied for in order of preference, should be forwarded to undersigned so as to be received by 13th August, 1949. H. BLYTHE, Secretary to the Management Committee.

LIVERPOOL MATERNITY HOSPITAL. The United Liverpool HOSPITALS. Required, RESIDENT HOUSE SURGEON (B2), Male or Female, post vacant for 6 months commencing 1st October, 1949. Salary £350–£450 p.a., according to experience, less £100 for board and residence, in accordance with the nationally agreed terms and conditions of service (House Officers). R practitioners holding A posts may apply.

Applications should be made on forms obtainable from undersigned, to whom they should be returned by 10 A.M., 6th August, 1949.

A. V. J. HINDS, Secretary,
The United Liverpool Hospitals.
80, Rodney-street, Liverpool, 1, 13th July, 1949.

LIVERPOOL, 6. MILL ROAD INFIRMARY. (Maternity Unit— 120 Beds.) Applications invited from practitioners with special experience of obstetrics and gynæcology, and possessing suitable higher qualifications for post of SENIOR RESIDENT OBSTETRICAL OFFICER AND DEPUTY MEDICAL SUPERINTENDENT (Senior Registrar, Grade 1 status). Salary will be in accordance with the Ministry's scale—i.e., £1000 p.a. in the first year, £1100 p.a. in the second year, £1200 p.a. in the third year, £1300 p.a. in the subsequent years. A deduction of £200 p.a. will be made in respect of certain residential emoluments. Married quarters are available.

Applications, giving full details of qualifications, previous experience, and enclosing names and addresses of 3 referees, *should be forwarded by 30th August, 1949, to—*

H. BLYTHE, Secretary to the Management Committee.
Broadgreen Hospital, Edge Lane-drive, Liverpool, 14.

LIVERPOOL. ROYAL LIVERPOOL CHILDREN'S HOSPITAL. THE UNITED LIVERPOOL HOSPITALS. Applications invited from registered medical practitioners, Male and Female, for resident A and B2 posts, vacant for 6 months commencing 1st October, 1949, as follows :—

At the City Branch. Myrtle-street, Liverpool, 7

HOUSE PHYSICIAN.
HOUSE SURGEON (orthopædic).
HOUSE SURGEON (skin, eye, and E.N.T.).
SENIOR CASUALTY OFFICER.

At the Heswall Branch. Telegraph-road, Heswall, Cheshire

HOUSE PHYSICIAN.
HOUSE SURGEON.
HOUSE SURGEON (orthopædic).

Salary £350–£450 p.a., according to experience, less £100 for board and residence, in accordance with the nationally agreed terms and conditions of service (House Officers). The Hospital is recognised as giving the requisite experience for the D.C.H. R practitioners holding A posts or within 3 months of qualification may apply.

Applications should be made on forms obtainable from undersigned, to whom they should be returned by 10 A.M., 6th August, 1949.

A. V. J. HINDS, Secretary,
The [illegible] Hospitals.
80, Rodney-street, Liverpool, [illegible]

LIVERPOOL. ROYAL LIVERPO[illegible] THE UNITED LIVERPOOL HOSPITAL[illegible] DENT MEDICAL OFFICER ([illegible] Heswall Branch, Telegraph-road, [illegible] commencing 1st October, 1949. [illegible] for a further 6 months from 1st [illegible] and salary will be £700–£800– a Junior Hospital Medical Officer and salary will be There will be a £1000 p.a., according to previous posts held. There will be a deduction at rate of £100 p.a. in respect of board and lodging. Applicants should have had previous experience in pædiatrics.

Applications should be made on forms obtainable from undersigned, to whom they should be returned by 10 A.M., 6th August, 1949.

A. V. J. HINDS, Secretary,
The [illegible]
80, [illegible]

LIVERP[illegible] [illegible] ROY[illegible] DAVID [illegible] LIVERP[illegible] [illegible] B2), MEDIC[illegible] months commencing 1st October, 1949. accordin[illegible] less £100 for accordan[illegible] agreed service [illegible] practitioners holding A posts or within 3 months of qualification may apply.

Applications should be made on forms obtainable from undersigned, to whom they should be returned by 10 A.M., 6th August, 1949.

A. V. J. HINDS, Secretary,
The United Liverpool Hospitals.
80, Rodney-street, Liverpool, 1, 13th July, 1949.

LIVERPOOL. ST. PAUL'S EYE HOSPITAL. The United Liverpool HOSPITALS. Required, RESIDENT HOUSE SURGEON (B2), Male or Female, post vacant for 6 months commencing 1st October, 1949. Salary £350–£450 p.a., according to experience, less £100 for board and residence, in accordance with the nationally agreed terms and conditions of service (House Officers). R practitioners holding A posts may apply.

Applications should be made on forms obtainable from undersigned, to whom they should be returned by 10 A.M., 6th August, 1949.

A. V. J. HINDS, Secretary,
The United Liverpool Hospitals.
80, Rodney-street, Liverpool, 1, 13th July, 1949.

LIVERPOOL. THE WOMEN'S HOSPITAL. The United Liverpool HOSPITALS. Required, RESIDENT HOUSE SURGEON (B2), Male or Female, post vacant for 6 months commencing 1st October, 1949. Salary £350–£450 p.a., according to experience, less £100 fo[illegible] accordance with the nationally ag[illegible] of service (House Officers). R [illegible] may apply.

Applicatio[illegible] obtainable from undersigned, to whom they should be returned by 10 A.M., 6th August, 1949.

A. V. J. HINDS, Secretary,
The United Liverpool Hospitals.
80, Rodney-street, Liverpool, 1, 13th July, 1949.

LIVERPOOL. WALTON HOSPITAL. (1400 Beds.) Applications invited from medical practitioners who have completed or are exempt from national service for appointment of HOUSE OFFICER. Duties will be in a large Orthopædic Department. *Preference given to those intending to make a career in orthopædic surgery.* Salary and conditions of service in accordance with regulations of the Ministry of Health, the salary being at rate of £350–£450 p.a., according to the number of posts held, subject to a deduction at rate of £100 p.a. in respect of board and lodging and other services provided. Appointment for 6 months in the first instance but may be extended, and subject to 1 month's notice on either side.

Applications, stating experience and qualifications, and names of 2 referees, should be submitted immediately to the Medical Superintendent.

F. J. WATKINS, Secretary,
[illegible] agement *Committee.*
Walto[illegible]

LEIGH IN[illegible] Hospital—102 Beds.) CASUALTY OFFICER (A), Male or Female, required at above Hospital. *Salary in accordance with latest Ministry of Health* scales, including board, residence, &c. R practitioners within 3 months of qualification may apply, when appointment limited to 6 months.

Applications, stating age, qualifications with dates, and nationality, with copies of 3 recent testimonials, should be sent as soon as possible to—

T. W. HURST, Secretary,
[illegible] Committee.

[illegible] HOSPITAL [illegible] ic and other handicapped [illegible] COMMITTEE [illegible] B2). Salary [illegible] ners holding [illegible] to 6 months [illegible] ineligible for [illegible] e submitted [illegible]

LIN[illegible] COUNTY HO[illegible] uired, House [illegible] ntial emolu[illegible] in 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for 6 months.

Apply immediately, with copies of 3 references, to the Secretary, Lincoln No. 1 Hospital Management Committee, County Hospital, Lincoln.

LINCOLN COUNTY HOSPITAL. Locum Anæsthetist required immediately.

Please apply giving full details to the Secretary.

LLANELLY HOSPITAL. Required, House Surgeon (B2) at the Llanelly Hospital, Llanelly, post now vacant. Salary £350 p.a., with full residential emoluments. To R practitioner appointment limited to 6 months.

Applications should be forwarded to—

[illegible] Secretary,
Glantawe [illegible] Committee.
Swansea Hospital, St. He[illegible]

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON to the E.N.T. Department, post vacant 1st September, 1949. Candidates must be single, of British nationality, and should have had some experience in the treatment of diseases of the ear, nose, and throat. Hospital recognised by the Examining Board for the D.L.O. Appointment for 6 months. Salary (including residential emoluments) and conditions will be in accordance with terms and conditions of service of Hospital Medical and Dental Staff (England and Wales).

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, to be forwarded to the Secretary at the Hospital.

MORPETH, NORTHUMBERLAND. ST. GEORGE'S HOSPITAL. Locum Tenens MEDICAL OFFICER required immediately for an indefinite period, not less than a month but possibly longer. Knowledge of psychiatry desirable but not essential. Salary 10–12 guineas weekly, according to experience, usual residential emoluments. Suitable applicants may be considered for an existing vacancy on the permanent staff.

Applications, stating age and relevant particulars, to be addressed to the Medical Superintendent.

MANCHESTER 19. DUCHESS OF YORK HOSPITAL FOR BABIES. (101 Cots.) MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. Applications invited from medical practitioners (Male and Female) for following posts:—

(*a*) SENIOR RESIDENT MEDICAL OFFICER (B1) for 6 months, renewable for a further 6 months, post now vacant. Candidates must have had experience in pædiatrics and higher qualifications are desirable. R practitioners eligible for H.M. Forces holding B1 or A posts not considered.

(*b*) HOUSE OFFICER (A) for 6 months. Required immediately.

Salaries in accordance with terms and conditions of service recently published.

Applications, with names of 3 referees, to be sent as soon as possible to the Secretary, Management Committee Group 21, Booth Hall Hospital, Blackley, Manchester, 9.

MANCHESTER. VICTORIA MEMORIAL JEWISH HOSPITAL, CHEETHAM, MANCHESTER, 8. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SURGICAL OFFICER required immediately. Post is graded as Junior Registrar at a salary of £670 p.a. less emoluments. Recognised by the Royal College of Surgeons as a qualifying service for F.R.C.S. Appointment is for 12 months. Suitably qualified R practitioners holding B2 also those holding B1 and ineligible for H.M. Forces may apply.

Applications with copies of not less than 3 recent testimonials, or names of 3 referees, to be submitted forthwith to the Hospital Administrator at the Hospital.

MANSFIELD. HARLOW WOOD ORTHOPÆDIC HOSPITAL, near MANSFIELD, NOTTS. Required, RESIDENT HOUSE SURGEON (B2), Male or Female. Appointment for 6 months. Salary, with full residential emoluments, £300 p.a.; but adjustment will be made in accordance with the appropriate National Health Service scale. Practitioners holding A posts may apply.

Applications, with testimonials, to be sent to the Secretary, Nottingham No. 5 Hospital Management Committee.

MARGATE. ROYAL SEA-BATHING HOSPITAL. (200 Beds.) ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEE. Required HOUSE SURGEON (A), post now vacant. Post affords special opportunities for the study of surgical tuberculosis. Appointment for 6 months. Salary £250 p.a., with full residential emoluments, subject to review when the National Health Service terms [illegible] come operative. R practitioners within [illegible] may apply.

App[illegible] qualifications, with copies of 3 recent testimonials, should be sent immediately to the Medical Superintendent, Royal Sea-Bathing Hospital, Margate.

MARGATE. GENERAL HOSPITAL. (132 Beds.) Isle of Thanet HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A), post vacant immediately. Appointment for 6 months. Salary £250 p.a., with full residential emoluments subject to review when the National Health Service terms and conditions of service become operative. R practitioners within 3 months of qualification may apply.

Applications, stating age and qualifications, with copies of 3 recent testimonials, should be sent as soon as possible to the Administrator, The General Hospital, Margate.

MEXBOROUGH. MONTAGU HOSPITAL. Required, Resident HOUSE PHYSICIAN. Commencing salary £350 p.a., from which a deduction of £100 p.a. for emoluments will be made. R practitioners ineligible for H.M. Forces or within 3 months of qualification considered, when appointment will be limited to 6 months in the first instance, and is subject to National Health Service (Superannuation) Regulations, 1947/48, and to medical examination.

Applications, stating age, qualifications experience, and nationality, with names of 3 referees, to be addressed to the Secretary, Rotherham and Mexborough Hospital Management Committee, Montagu Hospital, Mexborough, Yorks, as soon as possible.

MEXBOROUGH. MONTAGU HOSPITAL. Required, Resident HOUSE SURGEON. Commencing salary £350 p.a., from which a deduction of £100 p.a. for emoluments will be made. R practitioners ineligible for H.M. Forces or within 3 months of qualification considered, when appointment will be limited to 6 months in the first instance, and is subject to National Health Service (Superannuation) Regulations, 1947/48, and to medical examination.

Applications, stating age, qualifications, experience, and nationality, with names of 3 referees, to be addressed to the Secretary, Rotherham and Mexborough Hospital Management Committee, Montagu Hospital, Mexborough, Yorks, as soon as possible.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Required, HOUSE SURGEON (A) to a General Surgical Unit. Post recognised by the R.C.S. for the Final F.R.C.S. examination requirements. Duties entirely general surgical. Salary £250 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months.

Applications, with copies of 3 recent testimonials, to be sent as soon as possible to— F. L. Gatfield, Secretary.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Required, HOUSE SURGEON (A) or (B2) to the Orthopædic Department. Salary £250 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointment will be for a period of 6 months.

Applications should be addressed to—

F. L. Gatfield, Secretary.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Required, CASUALTY OFFICER AND HOUSE SURGEON (B2) to the Septic Unit. Salary £275–£325 p.a., according to experience, with full residential emoluments. R practitioners holding A posts may apply, when appointment will be limited to 6 months.

Applications should be sent as soon as possible to the Secretary.

NORWICH. HELLESDON HOSPITAL. Applications invited for post of PSYCHIATRIC REGISTRAR or JUNIOR REGISTRAR, resident. Hospital includes a separate unit for the treatment of neurosis and early psychosis and an E. E. G. Department. There are opportunities for experience in all modern forms of treatment, including attendance at outpatient and child-guidance clinics. Opportunity would be given for work for the D.P.M. A flat would be available at a reasonable rental for a married man. Salary in the terms of the nationally agreed scale, according to qualifications and experience.

Applications to the Medical Superintendent from whom further particulars may be obtained.

NEWARK DISTRICT HOSPITAL. (81 Beds.) Nottingham Area NO. 1 HOSPITAL MANAGEMENT COMMITTEE. CASUALTY HOUSE SURGEON (A), Male or Female. Salary £300 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months.

Applications to be sent to the Assistant Secretary, London-road, Newark-on-Trent.

NEWARK DISTRICT HOSPITAL. (81 Beds.) Nottingham Area NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT MEDICAL OFFICER (B2). Salary £350 p.a., plus the usual residential emoluments. R practitioners holding A posts may apply when appointment will be limited to 6 months.

Applications to be sent to the Assistant Secretary, London-road, Newark-on-Trent.

NEWCASTLE GENERAL HOSPITAL, 418, Westgate-road, Newcastle upon Tyne, 4. DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. Applications invited from registered medical practitioners who are not liable for service in His Majesty's Forces, for post of OBSTETRICAL HOUSE SURGEON (B2) to this department. Duties include the care of 40 Beds for Obstetrical patients and certain duties in the Gynæcological Unit when the House Surgeon to that Unit is off duty. Duties commence 1st September. 1949. Appointment for 6 months. Salary within scale of £250–£450, plus cost-of-living bonus and full residential emoluments. Hospital is recognised by the Royal College of Obstetrics and Gynæcology for the D.Obst.R.C.O.G., and M.R.C.O.G.

Applications should be sent without delay to the Medical Superintendent, Newcastle General Hospital, 418, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE UPON TYNE 6. WALKER GATE HOSPITAL. Required, RESIDENT JUNIOR REGISTRAR for the fever section at above Hospital. Salary on scale according to the Spens report for a residential post. Candidates should have completed their junior house appointments and it will be desirable that they should have experience in pædiatrics and if possible in infectious diseases. Applications from practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces.

Applications, with names and addresses of 2 referees, should be addressed to the Medical Superintendent by 2nd August, 1949. K. C. Booker, Secretary,

Newcastle upon Tyne Hospital Management Committee
"Oakville," Grainger Park-road, Newcastle upon Tyne, 4.

NEWPORT, I.W. ST. MARY'S HOSPITAL. Required, House SURGEON (A) or (B2). Appointment for 6 months and will be in accordance with the National Health Service terms and conditions of service of hospital, medical, and dental staffs. R practitioners within 3 months of qualification or holding A posts may apply.

Applications should be forwarded without delay to John E. Ray, Secretary of the Isle of Wight Group Hospital Management Committee, St. Mary's Hospital, Newport, I.W.

NEWPORT, MON. ST. WOOLOS HOSPITAL. 2 House Surgeons (A) are required at above Hospital of 402 Beds, one of whom will be engaged chiefly on gynæcology. Commencing salary £200 p.a., with full residential emoluments. R practitioners within 3 months of qualification may apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications, and names of 2 referees, to be sent to T. A. Jones, Hospitals Management Committee, 16, Cardiff-road. Newport, Mon.

NEWPORT. ROYAL GWENT HOSPITAL. House Physician (B2), required at above Hospital of 256 Beds. Salary £300–£350 p.a. after 6 months' service, with full residential emoluments.

Applications, stating age, particulars of qualifications, and copies of recent references, to be sent to T. A. Jones, Secretary, Newport and East Monmouthshire Hospitals Management Committee, 16, Cardiff-road, Newport, Mon.

NORTHALLERTON. FRIARAGE HOSPITAL. Required, House SURGEON for orthopædic duties and HOUSE OFFICER for general surgical and medical duties at above newly opened Hospital of 300 Beds, of which 120 at present occupied. Salary in accordance with scale for appropriate grade in Ministry of Health terms and conditions for hospital medical staffs. Appointment in first place to 1st October, and then renewable every 6 months.

Applications, giving age, qualificat[illegible] names of 2 referees, to be sent to th[illegible] Hospital Management Committee, [illegible] allerton, Yorks, as soon as possible.

NOTTINGHAM GENERAL HOSPITAL. (603 Beds, including "The Cedars" Branch Hospital.) Required, HOUSE SURGEON (B2), Male. Duties to commence on or about 10th August. Applicants should be interested in urology. Salary and conditions of service in accordance with the published conditions of the National Health Service. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months.

Applications, stating age, qualifications, and experience, with copies of testimonials, to be sent to—

Henry M. Stanley, Secretary, Nottingham
Area No. 1 Hospital Management Committee.

NOTTINGHAM GENERAL HOSPITAL. (547 Beds, including "The Cedars" Branc[illegible] CASUALTY OFFICER required. [illegible] or about 1st August. Salary £100 [illegible] emoluments. To practitioners liable for service with H.M. Forces appointment for 6 months.

Applications, stating age, qualifications, and experience, with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary,
Nottingham Area No. 1 Hospital Management Committee.

NOTTINGHAM GENERAL HOSPITAL (603 Beds, including "The Cedars" Branch Hospital) and RUDDINGTON HALL AUXILIARY HOSPITAL. Required, RESIDENT ORTHOPÆDIC AND FRACTURE HOUSE SURGEON. Applicants should have had previous experience in fracture and orthopædic work. The Orthopædic Department serves a large industrial district and post offers exceptional experience in traumatic surgery. Duties to commence the beginning of August. Salary and conditions of service in accordance with national recommendations; for first post £350, second £400, third and subsequent posts £150, less deduction at rate of £100 p.a., for board, lodging, &c. Appointment for 6 months in the first instance. Appointment subject to National Health Service (Superannuation) Regulations, 1947/48.

Applications, with copies of testimonials, should be sent as soon as possible to—

HENRY M. STANLEY, Secretary,
Nottingham Area No. 1 Hospital Management Committee.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL AND THE RADIUM INSTITUTE. Applications invited from registered medical practitioners for undermentioned appointments. Salaries in accordance with Ministry of Health terms and conditions of service.

RESIDENT ANÆSTHETIST (Junior Registrar), now vacant.
HOUSE OFFICER to :—
E.N.T. and Radiotherapy Departments, now vacant.
General Surgical Department, vacant 2nd August.
Gynæcology and Radiotherapy Departments, vacant 7th August.
General Surgical Department, vacant 26th September.

Applications, accompanied by testimonials, to be forwarded immediately to the Secretary and House Governor.

OLDHAM. BOUNDARY PARK GENERAL HOSPITAL AND ANNEXE. Required, JUNIOR REGISTRAR. Appointment provides full opportunities for experience in the treatment of acute medical cases and responsibilities for the chronic and mental cases in the Annexe. There are 2 House Physicians. Preference given to candidates who are intending to specialise in medicine and who hold a higher qualification. Salary scale £670 p.a., including emoluments valued at £100 p.a. in respect of board, residence, and laundry. The provision of married quarters could be considered.

Applications, which should contain full particulars of qualifications and experience, with names of 2 persons to whom reference may be made, should be forwarded immediately to—

F. W. BARNETT, Secretary,
Oldham and District Hospital Management Committee.
Central Offices, Rochdale-road, Oldham.

OSWESTRY. ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL. (479 Beds.) GROUP NO. 27, BIRMINGHAM REGION. REGISTRAR (resident) required at once as Assistant to the Senior Registrar. Terms of service in accordance with the recently issued regulations. Applicants must possess senior degree in surgery. Salary £775 p.a., less £100 for residential emoluments.

Applications, with copies of 3 testimonials, to be sent to the Secretary at once.

OXFORD REGIONAL HOSPITAL BOARD invite applications for post of SENIOR REGISTRAR IN ANÆSTHESIA at a salary of £1000–£100–£1300 p.a., in accordance with the recently announced terms and conditions of service. Post is whole-time, resident in the Aylesbury area; duties at the hospitals of the Aylesbury Management Committee, and at hospitals in the area of the Oxford Regional Hospital Board, for emergencies and holiday reliefs. Applicants should have the D.A. and at least 3 years' experience in anæsthetics.

Applications, with 9 spare copies, stating age, qualifications, experience, and names of 3 referees, should reach the Secretary of the Board, 43, Banbury-road, Oxford, by 13th August, 1949. Canvassing will disqualify.

***PENDLEBURY.* ROYAL MANCHESTER CHILDREN'S HOSPITAL.** SALFORD HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE PHYSICIAN (B2), Male or Female, post vacant 11th August, 1949. Appointment for 6 months. Salary at present £175 p.a., with full residential emoluments, but subject to review. R practitioners within 3 months of [illegible] holding A posts may apply.

[illegible] with dates, and
[illegible] to be sent to the
[illegible] Hospital, Pendle-

PR[illegible]ON ROYAL INFIRMARY. [illegible]
SURGEON (A) or (B[illegible]) [illegible]
accordance with national scale for
for F.R.C.S. examination. R pr[illegible]
qualification or holding A posts may apply.

Applications, stating age, [illegible] copy testi-
monials, should be sent to the [illegible] and Chorley
Hospital Management Commit[illegible] Preston.

PRESTON ROYAL INFIRMARY. (400 Beds.) Required, ORTHOPÆDIC HOUSE SURGEON (B2). 6 months' appointment.
[illegible] with national scale for House Officers.
[illegible] A posts may apply.
[illegible] with copy
[illegible] and Chorley
[illegible] Preston.

PRESTON ROYAL INFIRMARY. (400 Beds.) Resident Anæsthetic OFFICER (B2) required 1st September, 1949. Post recognised for D.A. examinations. Salary £400 p.a., less £100 for board[illegible]
[illegible] holding A posts may apply when
[illegible] months.
[illegible] qualifications, with copy testimonials, should be sent to the Secretary, Royal Infirmary, Preston.

PRESTON. SHAROE GREEN HOSPITAL. Preston and Chorley HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT MEDICAL OFFICER (A), post now vacant. Duties mainly medical. Salary £350 p.a., less £100 for board and residence. R practitioners within 3 months of qualification may apply, when appointment will be for 6 months; otherwise will not exceed 1 year.

Applications should be sent as soon as possible to the Medical Superintendent, Sharoe Green Hospital, Fulwood, Preston.

PLYMOUTH CLINICAL AREA. Mount Gold Hospital. Required,
ORTHOPÆ[illegible] on-resident
duties at Mo[illegible] orthopædic
clinics within [illegible] considerable experie[illegible] rgery and
possession of a higher surgical qualification desirable. Salary scale £775–£890 p.a. Appointment for 1 year, renewable for a further period.

Applications, with names of 2 referees, to be sent to the Secretary, Plymo[illegible]
c/o, Beaumont H[illegible]

PLYMOUTH. TH[illegible] SOU[illegible] [illegible]VON AND [illegible]
HOSPITAL, Lockyer-street, PLYMOUTH. THE PLYMOUTH, SOUTH
DEVON, AND EAST C[illegible] [illegible]ITAL MANAGEMENT
COMMITTEE. Requi[illegible] (A), with gynæco-
logy, post vacant [illegible] 250 p.a., with full
residential emolum[illegible] [illegible]thin 3 months of
qualification and lia[illegible] Forces may apply,
when appointment will be for 6 months.

Applications, with copies of 1–3 recent testimonials, should be sent immediately to ARTHUR R. CASH, Secretary.

PLYMOUTH. THE SOUTH DEVON AND EAST CORNWALL HOSPITAL, Freedom Fields, PLYMOUTH. Required, HOUSE SURGEON (A), post vacant 29th July, 1949. Salary £250 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months. Hospital recognised for the F.R.C.S. (Eng.).

Applications, with copies of 1–3 recent testimonials, should be sent immediately to—

ARTHUR R. CASH, Secretary,
The Plymouth, South Devon and East Cornwall
General Hospital Management Committee.

PLYMOUTH. THE SOUTH DEVON AND EAST CORNWALL HOSPITAL, Freedom Fields, PLYMOUTH. Required, RESIDENT ANÆSTHETIST (B2), Male or Female, preferably with D.A., post vacant 29th July, 1949. Salary £300 p.a., with full residential emoluments. R practitioners holding A posts may apply when appointment will be limited to 6 months.

Applications, stating age, nationality, qualifications, and experience, with 3 recent testimonials, should be sent to—

ARTHUR R. CASH, Secretary,
The Plymouth, South Devon and East Cornwall
General Hospital Management Committee.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road, PLYMOUTH. Required, HOUSE SURGEON (A) to the E.N.T. Dept., post vacant forthwith. Salary £250 p.a., full residential emoluments. R practitioners, ineligible for H.M. Forces or under 25½ years not having held an A post, considered. To practitioner liable for service with H. M. Forces appointment for 6 months.

Applications to ARTHUR R. CASH, Secretary.
Plymouth, South Devon, and East Cornwall General
Hospital Management Committee.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road, PLYMOUTH. THE PLYMOUTH, SOUTH DEVON, AND EAST CORNWALL GENERAL HOSPITAL MANAGEMENT [illegible] [illegible]ons invited from registered medical
[illegible]nents of :—
[illegible]), vacant from 18th July, 1949.
[illegible] A), vacant from 21st July, 1949.
[illegible] full residential emoluments. Practi-
[illegible] of qualification and liable under the
National Service Acts may apply, when appointments will be for 6 months.

Applications, with copies of 1–3 recent testimonials, should be sent to ARTHUR R. CASH, Secretary.

PONTEFRACT GENERAL INFIRMARY AND THE HYDES HOSPITAL. RESIDENT MEDICAL OFFICER (B2) required immediately at above Hospital. Appointment for 6 months at a salary of £300 p.a., with full board, residence, and laundry.

Applications should be sent to—

Pontefrac[illegible]

READING. RO[illegible] HO[illegible] [illegible]nd
[illegible]AGEMENT COMMITTEE. Required,
[illegible]1) to the E.N.T. Department, post
[illegible] Applicants should have held house
appointment and preference given to candidates holding the Fellowship of the Royal College of Surgeons, when salary will be at rate of £500 p.a. (subject to retrospective adjustment in accordance with national scales), with board, residence, and laundry. Applications from practitioners holding B1 posts
ca[illegible] ineligible to H.M. Forces.
[illegible]ualifications with dates, nationality,
pr[illegible] [illegible] 3 recent testimonials, should be
su[illegible] Administrative Officer, Royal
Be[illegible]

READING. ROYAL BERKSHIRE HOSPITAL. Reading and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Required. RESIDENT ANÆSTHETIST (B2). Male. post vacant 4th September, 1949. Salary £250 p.a. (subject to retrospective adjustment in accordance with national scales). full residential emoluments. R practitioners holding A posts may apply, when appointment will be for 6 months.

Applications, stating age, qualifications with dates, nationality, present post. with copies of 3 recent testimonials, should be submitted immediately to Administrative Officer, Royal Berkshire Hospital. Reading.

READING. ROYAL BERKSHIRE HOSPITAL. Reading and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Required. CASUALTY OFFICER AND ORTHOPÆDIC HOUSE SURGEON (B2). Male, post vacant 18th August, 1949. Salary £300 p.a. (subject to retrospective adjustment in accordance with national scales). full residential emoluments. R practitioners holding A posts may apply.

Applications, stating age. qualifications with dates, nationality, present post, with copies of 3 recent testimonials. should be submitted immediately to Administrative Officer, Royal Berkshire Hospital. Reading.

READING. BATTLE HOSPITAL. Reading and District Hospital MANAGEMENT COMMITTEE. Required. HOUSE SURGEON (A). Male, post vacant 19th July, 1949. Salary £250 p.a. (subject to retrospective adjustment in accordance with national scales), plus full residential emoluments. To practitioners liable for service with H.M. Forces *appointment for 6 months.*

Applications, stating age. qualifications with dates. nationality. present post. with copies of 3 recent testimonials. should be sent immediately to the Administrative Officer, Royal Berkshire Hospital, Reading.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. ROYAL BERKSHIRE (376 Beds) and BATTLE (420 Beds) HOSPITALS, READING. Required, RESIDENT HOUSE SURGEON (B2), Male. to the Obstetrical and Gynæcological Departments of these Hospitals. Appointment for 8 months, the first 4 being spent at Battle (duties obstetrical and gynæcological), and the second period at the Royal Berkshire (duties mainly obstetrical). Salary £250 p.a. (subject to retrospective adjustment in accordance with national scales), full residential emoluments. R practitioners holding A posts may apply.

Applications, stating age, qualifications with dates, nationality, present post, with copies of 3 recent testimonials. should be submitted immediately to Administrative Officer, Royal Berkshire Hospital, Reading.

RAMSGATE. THE GENERAL HOSPITAL. *(101 Beds.) Isle of* THANET HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A), post vacant immediately. Appointment for 6 months. *Salary £250 p.a., with full residential emoluments,* subject to review when the National Health Service terms and conditions of service become operative. R practitioners within 3 months of qualification may apply.

Applications, stating age. and qualifications, with copies of 3 recent testimonials, should be sent as soon as possible to the Administrator, The General Hospital, Ramsgate.

REDRUTH. CAMBORNE-REDRUTH MINERS' AND GENERAL HOSPITAL. WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A), Male or Female. Salary £250 p.a., with the usual residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months, or until 26th birthday.

Applications, stating date of birth, with copies of 3 testimonials. to be addressed to—

NORMAN O. DEANS, Secretary-Superintendent.

ROCHDALE INFIRMARY. Required, Resident House Surgeon (A) at above Infirmary. Salary in accordance with section 4 of terms and conditions of service of Hospital Medical Staff—viz., salary range £350–£450, according to previous posts (if any) held, less a deduction at rate of £100 p.a. in respect of board and lodging. R practitioners within 3 months of qualification may apply, when appointment will be limited to 6 months. Officers who were transferred under section 68 of the National Health Service Act will be entitled to retain their previous salary scale and conditions of service provided that their present appointment is of similar status to the one now advertised.

Applications should be forwarded to the Secretary, Rochdale and District Hospital Management Committee, 132, Drake-street. Rochdale, immediately.

ROTHERHAM. DONCASTER GATE HOSPITAL. (166 Beds.) Required. RESIDENT HOUSE SURGEON AND SECOND CASUALTY OFFICER. Commencing salary £350 p.a., from which a deduction of £100 p.a. for emoluments will be made. R practitioners ineligible for H.M. Forces or within 3 months of qualification considered. when appointment will be limited to 6 months in the first instance, and is subject to National Health Service (Superannuation) Regulations, 1947-48. and to medical examination.

Applications. stating age. qualifications. experience. and nationality, with names of 3 referees, to be addressed to the Secretary, Rotherham and Mexborough Hospital Management Committee, Montagu Hospital. Mexborough, Yorks, as soon as possible.

ROTHERHAM. OAKWOOD HALL SANATORIUM, Moorgate, ROTHERHAM. (100 Beds.) Required, REGISTRAR at above Hospital, who will also be required to attend at the Rotherham Isolation Hospital and 1 chest clinic. Salary £775 p.a., less a deduction of £100 for residential emoluments. R practitioners eligible for H.M. Forces holding B1 posts cannot be considered. [illegible] the National Health Service (Superannuation) [illegible] 1947-48, and medical examination.

[illegible] age. qualifications. experience. and [illegible] 3 referees, to the Secretary, Rotherham [illegible] Management Committee, Montagu Hospital, Mexborough, Yorks, as soon as possible.

ROMFORD. OLDCHURCH HOSPITAL. (750 Beds.) Required, JUNIOR MEDICAL OFFICER (B2) for casualty duties. Salary provisionally £472 10s. a year, rising by £25 annually to £650 a year, plus cost-of-living bonus. with residential emoluments valued £160 a year. pending the implementation of the recommendations of the Spens report. Appointment subject to provisions of the appropriate superannuation scheme and to passing a medical examination.

Applications, stating age, qualifications, present appointment, and experience, to be sent, with names of 2 referees, to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, immediately.

ROMFORD. RUSH GREEN HOSPITAL. (250 Beds.) Required, HOUSE SURGEON (B2). Salary provisionally £280 a year, plus cost-of-living bonus (at present £24 18s.), with free single quarters and board, pending the implementation of the recommendations of the Spens report. Appointment subject to provisions of the appropriate superannuation scheme and to passing a medical examination. R practitioners holding A posts may apply, when appointment will be limited to 6 months; otherwise 1 year.

Applications. stating age, qualifications, present appointment and experience, to be sent with names of 2 referees, to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, immediately.

RYDE. ROYAL ISLE OF WIGHT COUNTY HOSPITAL. House PHYSICIAN AND CASUALTY OFFICER (A) or (B2), required for duty 1st August 1949. Appointment for 6 months. Salary £350–£450 according to experience, with a deduction of £100 p.a. for board, lodging, and laundry. Post subject to National Health Service terms and conditions of service of hospital, medical, and dental staff. R practitioners eligible for H.M. Forces holding A posts not considered.

Applications, stating age, qualifications, experience. and nationality, with copies of 3 recent testimonials, to be forwarded without delay to the Secretary, Isle of Wight Group Hospital Management Committee. St. Mary's Hospital, Newport, I.W.

SALFORD ROYAL HOSPITAL. *Salford Hospital Management* COMMITTEE. Required, JUNIOR RESIDENT ANÆSTHETIC REGISTRAR (B1), post vacant 18th August. Salary in accordance with terms and conditions of service recently published by the Ministry of Health.

Applications, with 3 copy testimonials, should be addressed to the Superintendent as soon as possible.

SALISBURY GENERAL HOSPITAL. (475 Beds.) Required, REGISTRAR in E.N.T. Department at Salisbury General Infirmary and Odstock Hospital. Previous experience in E.N.T. work essential and a special E.N.T. qualification desirable. Department consists of 40 Beds, and there is also a busy Outpatient Department and Audiometric Clinic. Salary minimum rate £670 p.a. and conditions of service in accordance with the new National Health Service terms. Successful applicant required to commence duties 1st August, 1949, or as soon after that date as possible. Applications from practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces.

Applications. with particulars of experience and names of 2 referees, to be sent to the Secretary, Salisbury Group Hospital Management Committee, as soon as possible.

SALISBURY GENERAL HOSPITAL. (475 Beds.) Required, REGISTRAR in Tuberculosis Department at the Odstock branch of the Hospital. There are 50 Beds in the Department with a further 16 at an adjacent hospital. Appointment provides facilities for specialist training and previous experience in the treatment of pulmonary tuberculosis is essential. Salary at a minimum rate of £670 p.a. and conditions of service in accordance with the new National Health Service terms. Successful applicant required to commence duties 1st August, 1949, or as soon after that date as possible.

Applications, with particulars of experience, with names of 2 referees, to be sent to the Secretary, Salisbury Group Hospital Management Committee, as soon as possible.

SHEFFIELD. JESSOP HOSPITAL FOR WOMEN. United Sheffield HOSPITALS. Applications invited for post of BIOCHEMICAL RESEARCH ASSISTANT in the Laboratories of the Hospital. The work will include routine investigation and participation in research. Applicants should be graduates in science of a British university. A knowledge of female sex endocrinology is desirable. Commencing salary from £500–£600 p.a., according to experience.

Applications, with names of 2 referees. should be made by 20th August, 1949, to D. OSWALD, Superintendent.

SHEFFIELD. LODGE MOOR HOSPITAL (for Infectious Diseases). (508 Beds.) SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Required. ASSISTANT RESIDENT MEDICAL OFFICER (B2). Salary £330 p.a., with full residential emoluments. The selected candidate will be required to take up duties from 1st August. 1949. Appointment subject to provisions of National Health Service (Superannuation) Regulations. 1947-48. R practitioners holding A posts may apply. when appointment will be limited to 6 months. Ex-Service practitioners and practitioners ineligible for service with H.M. Forces may apply.

Applications should be sent immediately to the Medical Superintendent, Lodge Moor Hospital. Sheffield, 10.

SHEFFIELD. ROYAL INFIRMARY UNIT. *Applications invited* from registered medical practitioners, Male or Female. including medical officers recently demobilised from H.M. Forces, for post of FIRST ASSISTANT (B1) to the E.N.T. Department. Appointment of registrar status (salary £775 p.a.) and subject to Ministry of Health terms and conditions of service. Candidates must have held house appointments and had experience in otolaryngology. Applications from practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces.

Applications to be forwarded immediately to—

JOSEPH GRIFFITH. Chief Administrative Officer,
The United Sheffield Hospitals.
Royal Hospital, Sheffield, 1.

SHEFFIELD. ROYAL HOSPITAL UNIT. The United Sheffield HOSPITALS. Required, JUNIOR HOUSE PHYSICIAN (A), Male or Female, of whose duties part will be in the Casualty Department. Salary £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply when appointment will be for 6 months; otherwise may be extended.

Applications, and copy testimonials, to be forwarded immediately to A. P. PRENTICE, Superintendent.

The Royal Hospital, Sheffield, 1.

SHERBORNE. YEATMAN HOSPITAL. Required, House SURGEON (A), Male or Female, post vacant mid-August. Appointment tenable for 6 months. Appropriate Ministry of Health salary scale in accordance with experience, less £100 p.a. for residential emoluments.

Applications, giving age, qualifications, and nationality, with experience and copies of testimonials, to be sent immediately to the Secretary, West Dorset Group Hospital Management Committee, Dorchester, Dorset.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOSPITAL. NEW PATHOLOGICAL LABORATORY. Required, TECHNICIAN (Grade B) with good all-round experience. Hæmatology and biochemistry an advantage. Salary in accordance with the recommendations of the Joint Negotiating Committee (Medical Laboratory Technicians) and to be determined in the light of candidate's qualifications and experience.
if not a transferred officer, will be required
and appointment
(Superannuation) Regulations, 1947.
ıge and details of experience, should be
Medical Superintendent of the Hospital.
the names and addresses of 1–3 persons
to whom reference may be made.

A. V. OAKTON, Secretary-Administrator,
Worthing Group Hospital Management Committee.

SHOTLEY BRIDGE GENERAL HOSPITAL, co. Durham. (550 Beds.) NORTH-WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (A), Male or Female, post vacant 26th July, 1949. Salary £280 p.a., plus residential emoluments valued at £150 p.a. Appointment in the first instance for 6 months.

Applications, stating age, experience, and qualifications, with copies of recent references, should be addressed to the Medical Superintendent.

SHOTLEY BRIDGE GENERAL HOSPITAL, co. Durham. (550 Beds.) NORTH-WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Required, 3 HOUSE SURGEONS (A), Male or Female, posts vacant 25th July, 1949. Salary £280–£480 p.a., according to qualifications, plus residential emoluments valued at £150 p.a. Appointments in the first instance for 6 months.

Applications, stating age, experience, qualifications, with copies of recent references, should be addressed to the Medical Superintendent.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. Required, E.N.T. REGISTRAR (B1) which will be as Trainee Specialist, Grade 2 or 3, according to experience and qualifications. The D.L.O. qualification is desirable. Salary in accordance with proposed terms and conditions of service of Hospital Medical and Dental Staff, and subject to any alterations which may be made. Applications from practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces. Position vacant immediately.

Applications, stating age, qualifications, nationality, and experience, with copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Secretary,
Group 15 Hospital Management Committee.
Royal Salop Infirmary, Shrewsbury, 5th July, 1949.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) Required, HOUSE PHYSICIAN (B2), Male or Female, at the Copthorne Hospital, vacant immediately. 6 months' appointment. Salary £200 p.a., with full residential emoluments, but this figure is at present under consideration with a view to an increase. R practitioners holding A posts may apply.

Applications to— J. P. MALLETT, Secretary,
Group 15 Hospital Management Committee.

SHREWSBURY. ROYAL SALOP INFIRMARY. (240 Beds.) Required, HOUSE PHYSICIAN (A), Male or Female, post vacant 1st September, 1949. Salary £350 p.a., less £100 p.a. for residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply when appointment will be for 6 months; otherwise may be extended.

Applications, stating age, qualifications, nationality, and experience, with copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Secretary,
Group 15 Hospital Management Committee.
Board Room, 5th July, 1949.

SHREWSBURY. CROSS HOUSES HOSPITAL, near Shrewsbury. (183 Beds.) Required, RESIDENT MEDICAL OFFICER (B1). Salary according to previous post(s) held, £350, £400 or £450 p.a., with a deduction of £100 p.a. in each case for residential emoluments. Preference given to those applicants with previous obstetrical experience. Suitably qualified R practitioners holding B2 ... also those holding B1 and
ineligible for H.M. Fo
Applications, stati tionality, and
experience, with co sent to the
Medical Superintende Cross Houses,
near Shrewsbury.
Committee.
Shrewsbury Gro
Royal Salop Infirmary, Shrewsbury, 5th July, 1949.

SHREWSBURY. CROSS HOUSES HOSPITAL, Cross Houses, near SHREWSBURY. (183 Beds.) SHREWSBURY GROUP 15 HOSPITAL MANAGEMENT COMMITTEE. Locum MEDICAL OFFICER required. Post is resident and the salary 12 guineas per week.

Applications should be made to the Medical Superintendent, Cross Houses Hospital, near Shrewsbury.

SOUTHEND GENERAL HOSPITAL. Applications invited for following posts vacant 30th September, 1949:—

(*a*) GYNÆCOLOGICAL HOUSE SURGEON (B2), post recognised for M.R.C.O.G.

(*b*) HOUSE PHYSICIAN (B2) or (A). Post recognised for D.C.H.

Salary £225 p.a., with full residential emoluments, subject to adjustment when the Spens recommendations are implemented. R practitioners holding A posts may apply, when the appointments will be limited to 6 months.

Applications to reach undersigned by 9th August, 1949, quoting reference H.S.9.

J. C. FIELD, Secretary,
Southend-on-Sea Group Hospital Management Committee.
20, Warrior-square, Southend-on-Sea.

SOUTHEND GENERAL HOSPITAL. Required, Resident AnæsTHETIST (B2), post now vacant. Hospital recognised for D.A. Salary £250 p.a., subject to adjustment when the Spens recommendations are implemented. Appointment for 6 months in first instance with possibility of further 6 months at General Hospital, Rochford.

Applications, quoting reference H.S.9, stating age, qualifications, and experience, with copies of recent testimonials, to reach undersigned as soon as possible.

J. C. FIELD, Secretary,
Southend-on-Sea Group Hospital Management Committee.
20, Warrior-square, Southend-on-Sea.

SOUTHEND GENERAL HOSPITAL. Required, First House PHYSICIAN, post vacant 11th August, 1949. Present salary £225 p.a., with full residential emoluments.

Applications should be sent to undersigned at the Hospital, quoting reference H.S.9, by 25th July, 1949.

J. C. FIELD, Secretary,
Southend Group Hospital Management Committee.
20, Warrior-square, Southend-on-Sea.

SOUTHAMPTON INFECTIOUS DISEASES HOSPITAL AND SANATORIUM, SOUTHAMPTON. HOSPITAL
MANAGEMENT COMMITTEE. NT
MEDICAL OFFICER (A) o lary
£270 p.a., plus full residenti for
6 months in the first instance.

Applications, with copies of references, should be submitted as soon as possible to the Secretary, c/o Royal South Hants and Southampton Hospital, Southampton.

SOUTHAMPTON BOROUGH GENERAL HOSPITAL. House SURGEON required, resident, vacancy 1st August, 1949. Salary in accordance with the terms and conditions of service
re
ies of testimonials, to be forwarded as
so ecretary, Southampton Group Hospital
M Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL. (290 Beds.) 2 HOUSE PHYSICIANS (B2) required, resident, both the vacancies early September. Salary in accordance with the terms and conditions of service recently published.
testimonials, to be forwarded as

SOUTH SHIELDS GENERAL HOSPITAL. [illegible] PHYSICIANS (A), one post vacant 1st August, and the other two 1st September, 1949. Salary £210 p.a., plus emoluments, valued for superannuation purposes at £120 p.a. Above salary subject to adjustment when national scales are introduced. To R practitioners appointments restricted to 6 months in the first instance.

Applications, with copies of 2 recent testimonials, to be sent to the Medical Superintendent, General Hospital, Harton-lane, South Shields, as soon as possible.

SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14) MANAGEMENT COMMITTEE. Required, REGISTRAR ANÆSTHETIST preferably possessing a D.A. Remuneration and conditions of service will be in accordance with Ministry of Health scales.

Applications, with names and addresses of 3 referees, should be addressed to—

W. A. JAMES, Secretary to the Management Committee.
87, Radford-road, Leamington Spa.

STAMFORD, RUTLAND, AND GENERAL INFIRMARY. Required, CASUALTY OFFICER AND HOUSE PHYSICIAN (A), Male or Female, post now vacant. Salary £200 p.a., full residential emoluments.
ıge, qualifications with dates, nationality,
ıt testimonials, should be sent to the
y, Stamford.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL, BUCKNALL, STOKE-ON-TRENT. (202 Beds.) Required, RESIDENT MEDICAL OFFICER (B2), post vacant on or about 25th July, 1949. Salary £350 p.a., or according to previous hospital experience, with full residential emoluments. Appointment for 12 months in the first instance subject to extension by mutual agreement. R practitioners holding A posts may apply, when appointment will be limited to 6 months. Post offers exceptional experience in this specialty, and successful applicant will be required to work under the direction of the Medical Superintendent at the Hospital.

Applications should be addressed to the Medical Superintendent at above Hospital.

THORNBURROW GIBSON, Secretary,
Stoke-on-Trent Hospital Management Committee.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A), Male or Female, to the Gynæcological and Obstetrical Department. Salary £350 p.a., less a charge of £100 p.a. for residential emoluments. R practitioners within 3 months of qualification and liable under the National Service Acts may apply when appointment will be limited to 6 months.

Applications, with copy testimonials, to be forwarded as soon as possible to the Secretary of above Hospital.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A) to the Ophthalmic Department, Male or Female, post now vacant. Salary £350 less a charge of £100 p.a., for residential emoluments. Appointment recognised for the D.O.M.S. R practitioners within 3 months of qualification may apply, when appointment will be limited to 6 months.

Applications, with copy testimonials, to be forwarded as soon as possible to the Secretary of the above Hospital.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (B2), Male or Female, post vacant 15th August, 1949. Salary £400 p.a., less £100 p.a. for residential emoluments. To R practitioners appointment will be limited to 6 months.

Applications, with copy testimonials, to be forwarded as soon as possible to the Secretary of the above Hospital.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A), Male or Female, to the Orthopædic Department, post now vacant. Salary £350 p.a., less a charge of £100 p.a. for residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months.

Applications, with copy testimonials, to be forwarded as soon as possible to the Secretary of the above Hospital.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. Stoke-on-TRENT HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (A) or (B2), Male or Female, post now vacant. Appointment for 6 months. Pending acceptance of recommendations from Spens Committee and Ministry scales, salary will be £250–£550 p.a., according to qualifications, with full residential emoluments. R practitioners within 3 months of qualification or holding A posts, may apply.

Applications, stating age, qualifications, and dates, nationality, with copies of 2 recent testimonials, should be sent to the Medical Superintendent of the Hospital.

STOKE-ON-TRENT. LONGTON HOSPITAL. (55 Beds.) HOUSE SURGEON (A), Male or Female, post now vacant. Salary £250 p.a., with residential emoluments. Appointment for 6 months in the first instance, subject to renewal by mutual agreement. R practitioners, ineligible for H.M. Forces or under 25½ years of age not having held an A post, considered.

Applications, with full particulars, and copies of testimonials, should be forwarded as soon as possible to the Secretary at the Hospital.

THORNBURROW GIBSON, Secretary,
Stoke-on-Trent Hospital Management Committee.

STOCKPORT INFIRMARY. (179 Beds.) Required, Non-Resident CASUALTY HOUSE OFFICER to assist also with the Fracture Clinic and in the Orthopædic Department. Post tenable for 6 months. Salary £450.

Applications, stating age, *nationality*, and *qualifications*, with copies of 2 testimonials, to be forwarded to the Administrative Officer, The Infirmary, Stockport, immediately.

H. G. PRICE, Secretary, Stockport and
Buxton Hospital Management Committee.

STOCKPORT. STEPPING HILL HOSPITAL. (470 Beds.) Applications invited from registered medical practitioners for following posts:—

HOUSE OFFICER (medical).
HOUSE OFFICER (obstetrics).

Salary and conditions of service in accordance with Ministry of Health circular dated 7th June, 1949.

Applications, stating age, nationality, and qualifications, with copies of 2 testimonials, to be forwarded to the Medical Superintendent, Stepping Hill Hospital, Stockport, immediately.

H. G. PRICE, Secretary, Stockport and
Buxton Hospital Management Committee.

STANMORE. ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Brockley-hill, STANMORE, MIDDLESEX. 2 RESIDENT HOUSE SURGEONS (B2). Duties to commence 1st and 17th September respectively. Appointment limited to 6 months. Salary according to Ministry of Health scale for House Officers. R practitioners holding A posts may apply.

Applications to be addressed to the House Governor, 234, Great Portland-street, London, W.1. by 20th August.

STOURBRIDGE. WORDSLEY HOSPITAL, near Stourbridge. (440 Beds.) DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION. Required, RESIDENT SURGICAL OFFICER (B1), post vacant 15th September, 1949. Applicants should have held house appointments and had surgical experience. Preference given to candidates holding the Fellowship of one of the Royal Colleges. Post will be of registrar status and salary at rate prescribed by the Minister for appropriate grade. A deduction of £100 p.a. in respect of residential emoluments will be made. Period of post will be in accordance with the grade. Applications from R practitioners holding B1 posts cannot be considered unless they are ineligible for H.M. Forces.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, with copies of 3 recent testimonials, to H. RAYMOND HURST, Secretary, to the Management Committee, The Guest Hospital, Dudley.

STOURBRIDGE. WORDSLEY HOSPITAL, near Stourbridge. (440 Beds.) DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION. Required. RESIDENT HOUSE SURGEON (with anæsthetic duties), post now vacant and tenable for 6 months. Post will be House Officer status and salary at rate of £350 p.a.–£450 p.a., according to the number of posts previously held. A deduction of £100 p.a. in respect of residential emoluments will be made. R practitioners within 3 months of qualification or holding A posts may apply.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, with copies of 3 recent testimonials, to H. RAYMOND HURST, Secretary to the Management Committee. The Guest Hospital, Dudley, Worcs.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. Required, RESIDENT SURGICAL OFFICER (B1), post vacant 9th August, 1949. Salary £400 or £450 p.a. (subject to deduction for residential emoluments), according to number of posts previously held.

Applications, stating age, qualifications, and previous experience, with copies of 3 recent testimonials, should be forwarded immediately to— H. H. JONES, Secretary,
Stafford Hospital Management Committee.
13, Foregate-street, Stafford.

STRATFORD-UPON-AVON HOSPITAL. Casualty Officer and HOUSE SURGEON (A) or (B2). There are 2 other Resident Medical Officers. Appointment for 6 months, unless the successful applicant's 26th birthday falls within the normal 6 months' tenure of office. Salary in accordance with national scales.

Applications, stating age, and qualifications, with copies of 3 testimonials, should be sent as soon as possible to—
Stratford-upon-Avon Hospital. E. T. GRIFFIN.

STARCROSS, DEVON. THE ROYAL WESTERN COUNTIES INSTITUTION HOSPITAL GROUP. Required, ASSISTANT MEDICAL OFFICER. Salary £750, by annual increments of £50 to £1000 p.a., plus full residential emoluments which include furnished apartments at the Royal Western Counties Institution. Successful candidate required to pass a medical examination. The Hospital Group covers Devon and Cornwall and the patients under care and training total 2200.

Further particulars obtainable on request and applications stating age, qualifications, and experience, with copies of 3 testimonials, should be sent to the Medical Superintendent, The Royal Western Counties Institution Hospital Group, Starcross, Devon.

ST. LEONARDS-ON-SEA. BUCHANAN HOSPITAL. Applications invited from registered medical practitioners (Male or Female), including practitioners within 3 months of qualification and liable under the National Service Acts, for following appointments:—

(*a*) HOUSE SURGEON (A), vacant 19th August, 1949.
(*b*) HOUSE PHYSICIAN (A), vacant 2nd September, 1949.

Appointments for 6 months. Salary within scale £250–£500 p.a., according to qualifications, with full residential emoluments.

Applications to be sent to the Administrator, Buchanan Hospital, St. Leonards-on-Sea, Sussex.

H. A. FROGGATT, Secretary,
Hospital Management Committee, Hastings Group.

SUNDERLAND AREA HOSPITAL MANAGEMENT COMMITTEE. Applications invited for following posts:—

Royal Infirmary, Sunderland (312 Beds)

REGISTRAR (B1) to the Department of Physical Medicine, vacant. This is a large and progressive department and the medical staff are linked up with other hospitals in the area.

DERMATOLOGICAL REGISTRAR (B1), vacant. The medical staff of this department are linked up with other hospitals in the area and duties include supervision of the patients at 2 of the hospitals.

REGISTRAR (B1) to the E.N.T. Department, vacant.

These appointments are renewable annually for 3 years, are non-resident, and salary is in accordance with present grading.

Ryhope General Hospital, near Sunderland (300 Beds)

2 HOUSE SURGEONS (B2), Male, vacant. Salary £350 p.a., with full residential emoluments.

General Hospital, Sunderland (451 Beds)

REGISTRAR (B1) to the Obstetric and Gynæcological Department (over 100 Beds), now vacant. Hospital recognised for training for the M.R.C.O.G.

MEDICAL REGISTRAR (B1), Male, vacant.

These appointments are renewable annually for 3 years, and salary is in accordance with present grading.

HOUSE SURGEON (A), Male, vacant. Salary £200 p.a., with full residential emoluments.

Eye Infirmary, Sunderland (62 Beds)

HOUSE SURGEON (B2), vacant. Salary £300 p.a., with full residential emoluments.

Monkwearmouth and Southwick Hospital, Sunderland (120 Beds)

HOUSE SURGEON (A), Male or Female, vacant 1st August.
HOUSE PHYSICIAN (A), Male or Female, vacant 1st August.

Salary in each case £200 p.a., with full residential emoluments.

B1 posts, practitioners holding B1 posts cannot be considered unless ineligible for H.M. Forces. B2 posts, R practitioners holding A posts may apply, when appointment will be limited to 6 months. A posts, male practitioners within 3 months of qualification and eligible for military service may apply when appointment will be limited to 6 months. The above salaries subject to adjustment to future nationally revised rates, and applicants for Registrar posts should state present grading.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to—

F. DAGNALL, Secretary,
Sunderland Area Hospital Management Committee.
Royal Infirmary, Sunderland.

TAUNTON AND SOMERSET HOSPITAL. (291 Beds—8 Residents.) Applications invited from registered medical practitioners for following posts:—

HOUSE PHYSICIAN (A) or (B2).

HOUSE SURGEON (A) or (B2), E.N.T. and general surgery. Salary on National Health Service scale: for first post held £350 p.a., second post £400 p.a., third and subsequent posts £450, less deduction of £100 p.a. for board, lodging, &c. Appointments subject to National Health Service (Superannuation) Regulations, 1947/48. R practitioners within 3 months of qualification or holding an A post may apply. Post House Surgeon is recognised by the Royal College of Surgeons as a qualifying appointment for the Final Fellowship examination. Successful applicants required to take up their posts 1st September, 1949.

Applications, stating age, qualifications with dates, nationality, and details of experience, with 2 recent testimonials should be sent to the Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, East Reach, Taunton, Somerset.

TUNBRIDGE WELLS DISTRICT HOSPITAL. Tunbridge Wells (formerly Kent and Sussex Hospital). (350 Beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON ORTHOPÆDIC (A), Male or Female. Salary and conditions of service according to new scales. R practitioners within 3 months of qualification may apply, when appointment will be for 6 months.

Applications, stating age, qualifications, &c., with copies of 3 testimonials, to A. C. WAIGHT, Administrative Officer.

TUNBRIDGE WELLS DISTRICT HOSPITAL, Tunbridge Wells (formerly Kent and Sussex Hospital). (350 Beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE PHYSICIAN (B2), Male or Female, including Pædiatrics, post vacant 1st September, 1949. Salary and conditions of service according to new scale. R practitioners holding A posts may apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications, &c., with copies of 3 testimonials, to A. C. WAIGHT, Administrative Officer.

TUNBRIDGE WELLS DISTRICT HOSPITAL, Tunbridge Wells (formerly Kent and Sussex Hospital). (350 Beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (B2), Male or Female, post vacant 1st September, 1949. This post is recognised for F.R.C.S. Salary and conditions of service according to new scales. R practitioners holding A posts may apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications, &c., with copies of 3 testimonials, to A. C. WAIGHT, Administrative Officer.

TUNBRIDGE WELLS DISTRICT HOSPITAL, Tunbridge Wells (formerly Kent and Sussex Hospital). (350 Beds.) TUNBRIDGE WELLS GROUP COMMITTEE. Required, RESIDENT Male or Female, post vacant 4th A is recognised for the D.A. Salary and conditions of service according to new scales. R practitioners holding A posts may apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications, &c., with copies of 3 testimonials, to A. C. WAIGHT, Administrative Officer.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL MANAGEMENT COMMITTEE (234 Beds for pulmonary tuberculosis.) SOUTH-WEST METROPOLITAN REGION. Required, ASSISTANT RESIDENT MEDICAL OFFICER (B2), post vacant 1st September, 1949. Candidates must be unmarried. Salary £300 p.a., full residential emoluments. R practitioners holding A posts may apply when appointment limited to 6 months.

Applications, with copies of 3 testimonials, to Medical Superintendent.

WALLINGFORD. FAIR MILE HOSPITAL. Berkshire Mental HOSPITALS MANAGEMENT COMMITTEE. Required, ASSISTANT MEDICAL OFFICER (B1), Registrar. Present salary £550, rising by annual increments of £25 to £650 p.a., with board, furnished apartments, and laundry valued at £130 p.a. Salary subject to revision in the light of the proposed Ministry of Health scales and conditions of service at present being negotiated. If married, an unfurnished house will be available shortly, for which an appropriate rent will be charged. Applications from R practitioners now holding B1 posts cannot be considered unless they are ineligible for H.M. Forces.

Applications, in writing, should be sent to the Medical Superintendent as soon as possible.

WARWICK HOSPITAL, Lakin-road, Warwick. (348 Beds.) Required, HOUSE SURGEON (A) or (B2). Salary £250–£350 p.a., depending upon experience, with full residential emoluments. Good experience with General Surgery and Thoracic Surgery Units. Appointment for 6 months in the first instance. copies of 2 recent testimonials, to the by 6th August.

WARWICK HOSPITAL, Lakin-road, Warwick. (348 Beds.) HOUSE PHYSICIAN (A) or (B2). depending upon experience), with full residential emoluments. Good experience for candidate reading for D.C.H. Appointment for 6 months in the first instance.

Applications, with copies of 2 recent testimonials, to the Medical Superintendent by 6th August.

WESTON-SUPER-MARE GENERAL HOSPITAL. (100 Beds.) Required, HOUSE PHYSICIAN (A). Duties to commence 1st August, 1949. Salary £200 p.a., with full residential Practitioners within 3 months of qualification National Service Acts may also apply, for 6 months.

age, qualifications, with dates, and s of 3 recent testimonials, should be addressed to LEWIS D. HULL, Secretary.

WAKEFIELD, YORKSHIRE. CLAYTON HOSPITAL. Required, HOUSE SURGEON (A) 6 months. Salary £200 p.a., resident. Salary subject to retrospective adjustment when the Ministry's terms for services are introduced.

Applications to be sent to—

W. READ, Secretary,
Hospital Management Committee No. 9, Wakefield A Group.

WHISTON. COUNTY HOSPITAL. Required, Anæsthetic REGISTRAR (Grade 2). Salary £775–£890 and includes the value of residential emoluments. Appointment tenable for 12 months in the first instance, and successful applicant will be required to work under the supervision of the Visiting Anæsthetists. Hospital is approved for the D.A. R practitioners holding B2 appointments, also those holding B1 and ineligible for H.M. Forces, are invited to apply.

Applications to be forwarded as soon as possible to—

N. Helens and
Distri Committee.
Group Office, County
near, Prescot, Lancs.

WHISTON. COUNTY HOSPITAL. Required, Orthopædic REGISTRAR (Grade 2). Salary £775–£890 and includes the value of residential emoluments. Appointment tenable for 12 months in the first ir cant will work under the supervision o Surgeon. R practitioners holding B2 holding B1 and ineligible for H.M. Fo

Applications to be forwarde

N. RICHARDS, Secretary, St. Helens and
District Hospital Management Committee.
Group Office, County Hospital, Whiston,
near Prescot, Lancs.

WHISTON. COUNTY HOSPITAL. Required, Resident HOUSE SURGEON (2 vacancies). Hospital approved for the F.R.C.S. Appointment tenable for 6 months. Salary £350– revious appointments, which includes valued at £100.

rwarded as soon as possible to—

N. RICHARDS, Secretary, St. Helens and
District Hospital Management Committee.
Group Office, County Hospital, Whiston,
near Prescot, Lancs.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associate Hospital of the University of Birmingham Medical School.) WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 16, BIRMINGHAM REGION. Required, FRACTURE AND ORTHOPÆDIC REGISTRAR, post vacant now. Salary £670 p.a. (or according to experience), non-residential for an officer appointed not less than 2 years after registration, when post will be for 1 year.

Applications to W. COCKBURN, House Governor.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associate Hospital of the University of Birmingham Medical School.) WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 16, BIRMINGHAM REGION. Required, REGISTRAR, Pathological Department, post vacant now. Successful applicant will be resident at New Cross Hospital, one of the hospitals in the group with 600 Beds, but will be under the direction of the Director of Pathology at The Royal Hospital. Salary £670 p.a. with £100 deduction p.a. for living in at New Cross.

Applications, stating age, qualifications, and experience with copies of 3 recent testimonials, to be addressed to—

W. COCKBURN, House Governor.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associate Hospital of the University of Birmingham Medical School.) AL MANAGEMENT COMMITTEE, GROUP ION. Required, HOUSE SURGEON, Department, post vacant now. Salary experience, with a deduction of £100 ments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months.

Applications to W. COCKBURN, House Governor.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associate Hospital of the University of Birmingham Medical School.) WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16, BIRMINGHAM REGION. Required, HOUSE SURGEON, E.N.T. Department. Salary £350 once, with a deduction of £100 p.a. Practitioners within 3 months of service with H.M. Forces may apply for 6 months.

Applications to W. COCKBURN, House Governor.

WORKINGTON INFIRMARY, Workington, West Cumberland. Required, HOUSE SURGEON (A) or (B2), Male or Female, post now vacant, at above Hospital. Successful candidate will work under the direction of the Surgical Consultant for the area, and the post offers good experience in general surgery and casualty work. Salary ional scale.

Applications, with copies should be sent to the Secretary, West anagement Committee, 19, Falcon-s umberland, immediately.

WREXHAM AND EAST DENBIGHSHIRE WAR MEMORIAL HOSPITAL. (170 Beds.) Required, RESIDENT HOUSE SURGEON (A), Male or Female, Casualty and Fracture Department for 6 months, commencing 14th July, 1949. Salary £300 p.a., plus temporary cost-of-living bonus, with full residential emoluments. R practitioners, ineligible for H.M. Forces or under 25½ years not having held an A post, considered.

Applications, stating age, nationality, qualifications, with copies of testimonials, to—

WILLIAM JONES, Secretary,
Wrexham Hospital Management Committee.
Emergency Hospital, Wrexham.

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WORTHING HOSPITAL. (200 Beds—4 Resident Officers.) Required, SENIOR HOUSE SURGEON (A). Salary £200 p.a., plus full board and lodging. Post recognised to the extent of 6 months for the F.R.C.S. qualification, and vacant from 24th July, 1949.

Applications should be forwarded to the Administrative Officer, Worthing Hospital, as soon as possible. An appointment will be made as soon as a suitable application is received.

A. V. OAKTON, Secretary Administrator,
Worthing Group Hospital Management Committee.

Public Appointments

HIS MAJESTY'S COLONIAL SERVICE, UGANDA. Applications invited from medical practitioners with qualifications registrable in the United Kingdom for 10 vacancies for MEDICAL OFFICERS in Uganda. Salary in scale £865, £865, £935–£35–£1005–£45–£1140–£45–£1320. Allowance for qualifications and experience may be made in determining initial salary in the scale. Private practice is not allowed but consulting practice is allowed and half the fees received in respect thereof will be paid to officers. Women candidates may not be considered. Duties include medical, surgical, and public-health duties (including the prevention of communicable diseases), maternity and child welfare, school medical work, and the administration of local medical units and medical and health services under the direction of the senior departmental officer. The officer may also be required to undertake or assist in duties connected with the training of subordinate African medical and health personnel. First-class passages provided for officers and wives. Partly furnished quarters provided subject to deduction of 10% of salary.

Forms of application may be obtained on request (quoting reference no. 27215/158) from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1.

MINISTRY OF PENSIONS

Stoke Mandeville Hospital, Aylesbury, Bucks (650-bedded hospital for the treatment of general medical and surgical orthopædic, neurosurgical, plastic, tropical, and limbless cases).

A vacancy exists for an ANÆSTHETIST at above Hospital. Applicants must hold the qualification of D.A. Salary in range of £650–£900 p.a., plus emoluments—*i.e.*, free board and lodging or an allowance of £100 p.a. in lieu if non-resident. Suitably qualified R practitioners holding B1 posts who are ineligible for H.M. Forces are invited to apply.

Applications, stating age, qualifications with dates, and nationality, with copies of 2 recent testimonials should be addressed to the Secretary, Ministry of Pensions (M.S.2), Norcross, Blackpool, Lancs.

ROYAL NEW ZEALAND AIR FORCE. Required, a Junior MEDICAL OFFICER for service with the R.N.Z.A.F. as Flight-Lieutenant for a period of 2 years. Should have served with the R.A.F. Medical Branch. Free passage to New Zealand for selected Medical Officer and wife.

Written applications giving details of service and qualifications to Headquarters, Royal New Zealand Air Force, Halifax House, 51, Strand, London, W.C.2.

General Practice

BIRMINGHAM EXECUTIVE COUNCIL. Vacancy, Sparkhill District. As a result of the forthcoming withdrawal from the Medical List of the Birmingham Executive Council of 2 doctors who are practising in partnership, a vacancy will occur in
the provision of general medical
to be served is urban. Retiring
ailable their living and surgery
of this accommodation will be
supplied on request. Approximate number of persons on the combined lists of the retiring doctors is 5500.

Applications, in writing, on Form E.C.16 (obtainable from address given below) should be sent to undersigned, with details of professional experience (including any military service), age, and any other supporting particulars, including any references it is desired to submit, to arrive by 3rd August, 1949.

K. F. G. DAY. Clerk of the Council.
Sutton New-road, Erdington, Birmingham, 23,
15th July, 1949.

CROYDON EXECUTIVE COUNCIL. Vacancy, 30, Norbury-road, THORNTON HEATH. Applications invited from registered medical practitioners willing to provide general medical services under the National Health Service Act for vacancy in Croydon caused by resignation as from 30th September, 1949, of former practitioner. Area which needs to be served is mainly residential and number of patients on list of retiring doctor on 1st July, 1949, was 3659. Surgery and living accommodation at 30, Norbury-road, Thornton Heath, is available for purchase, and also retiring practitioner's private residence "The Glade," 180, Pampisford-road, South Croydon. The living accom-
th is at present occupied by a
regarding these properties should
be addressed to Messrs. Benson, Mazure and Co., Solicitors, 54, Welbeck-street, London, W.C.1.

Applications, in writing, on form E.C.16 (obtainable from address given below) should be sent to undersigned, with details of professional experience, age and other supporting particulars, including any references it is desired to submit, by 30th July, 1949, clearly marked "Medical Vacancy."

E. BERGDAHL, Clerk of the Council.
14, Katharine-street, Croydon.

ST. HELENS EXECUTIVE COUNCIL. Applications invited from registered medical practitioners willing to provide general medical services under the National Health Service Act for a VACANCY in the Sutton district of St. Helens, caused by the death of former practitioner. District which needs to be served is urban. It is not possible to state whether the surgery or living accommodation is available and applicants should, therefore, consider the possibility of making such arrangements themselves. Approximate number of patients on list is 3200.

Applications, in writing, on Form E.C.16 (obtainable from address given below), should be sent to undersigned, with details of professional experience, age, and other supporting particulars, including any references it is desired to submit, by 30th July, 1949.

WM. SHAW, Clerk of the Council.
9, Hardshaw-street, St. Helens.

Miscellaneous

CITY OF BIRMINGHAM

Home Nursing Service.—Queen's Nurses, Female, required for general nursing only. Resident or non-resident. Cyclists or motorists. Good allowance paid to car owners. Salary according to Rushcliffe scale.

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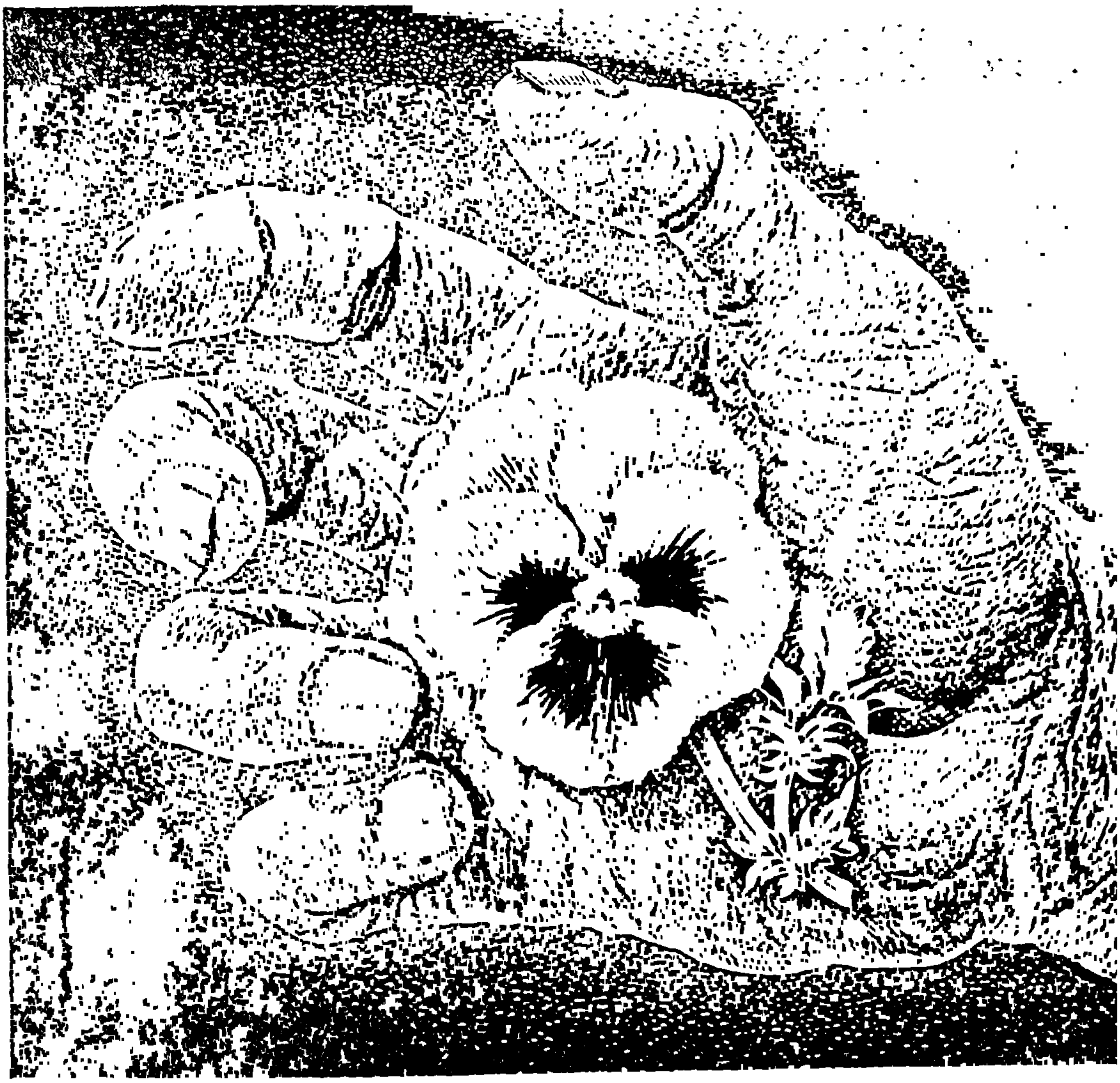

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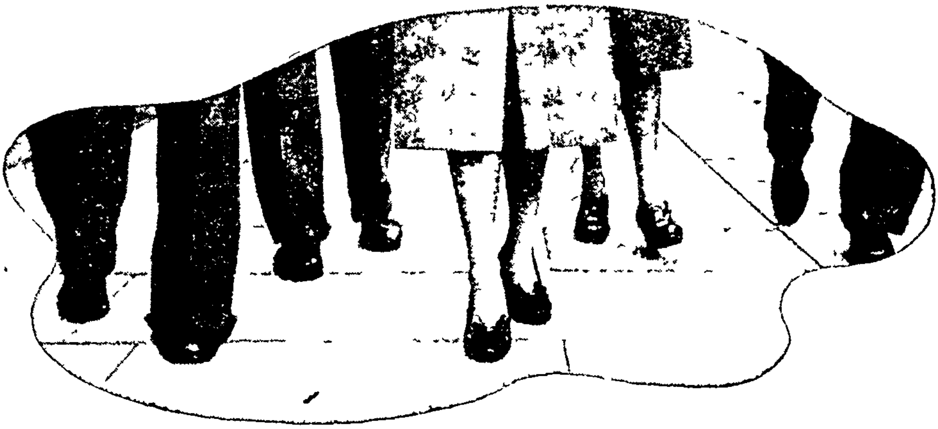

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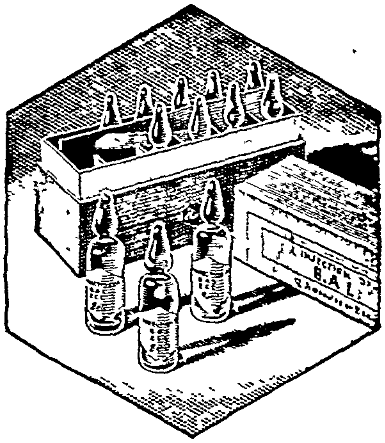

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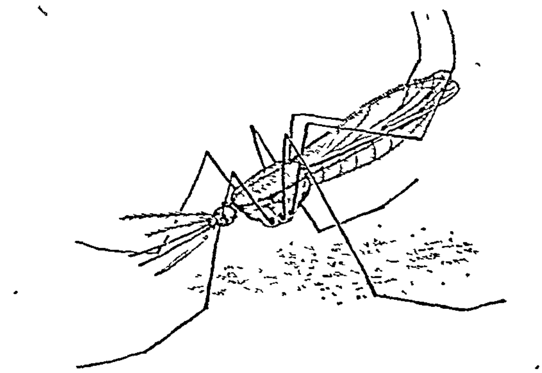

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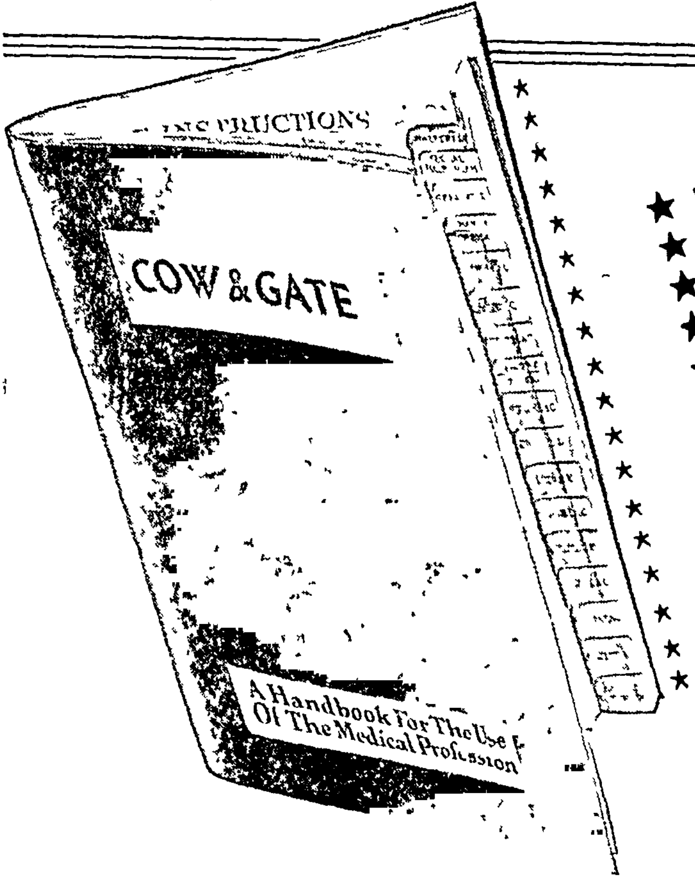
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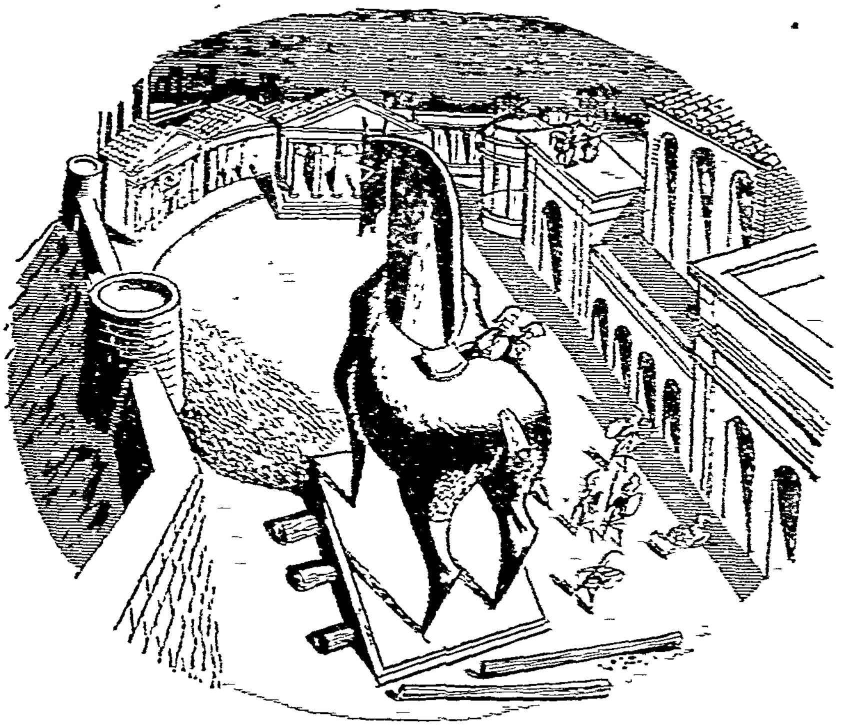

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HE PREVENTION OF BURNS AND SCALDS

REVIEW OF 1000 CASES

LEONARD COLEBROOK
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TE DIRECTOR OF THE MEDICAL RESEARCH COUNCIL BURNS UNIT, BIRMINGHAM ACCIDENT HOSPITAL

VERA COLEBROOK

DURING the early years of this century both *The Lancet* .905, 1907) and the *British Medical Journal* (1910, 1912) epeatedly expressed concern over the deaths from burns nd scalds, which at that time totalled over 2000 a year, 0% of them in children. Coroners also spoke strongly n the subject, calling particular attention to the danger f leaving young children alone with an unguarded fire, nd to the extreme inflammability of the then comparaively new material flannelette, which had come into ommon use because it was comfortable to wear, easy to vash, and cheap (from 2¾*d.* a yard).

In 1908–09 the Government took two steps: Parlianent inserted clause 15 in the Children's and Young Persons' Act, 1908, which made parents liable to a fine of up to £10 if a child of 7 years or under was seriously injured or died from burns or scalds caused through an unguarded *open* fire (at that time electric and gas radiants were not in general use); and the Home Office appointed a committee to report on the dangers of flannelette and on a method of fireproofing it with stannic oxide which had recently been patented by Prof. W. H. Perkin, of Manchester, in association with a firm of flannelette manufacturers.

TABLE I—COMPARISON OF HOME AND INDUSTRIAL BURNS AND SCALDS ADMITTED TO THE MEDICAL RESEARCH COUNCIL BURNS UNIT, BIRMINGHAM ACCIDENT HOSPITAL, 1945–48

Burns and scalds	Age-group (years)					Deaths	Case-mortality (%)	Stay in hospital (days)
	4 or less	5–14	15–64	65 or more	Total			
At home ..	373	117	166	43	699	44	6·3	24,402 (av. 34·9)
In industry	0	6	292	3	301	4	1·3	10,180 (av. 33·8)
Total ..	373	123	458	46	1000	48	4·8	34,582 (av. 34·5)

Neither of these steps was effective. Magistrates were reluctant to add to the burden of parents whose child had died; and in any case prosecutions were rare. Of twelve prosecutions reported in the *Times* in 1909 under the new Act only one was for neglect to provide a fireguard. In practice, therefore, clause 15 was a dead letter from the start, and today many parents do not even know it is still law. The flannelette inquiry was also abortive, but for reasons difficult to understand (see below).

The war of 1914–18, which broke out soon after the committee's report was issued, brought much graver dangers to the nation, and the deaths of children from burning were forgotten. Since then, the number of deaths, particularly from burns, has steadily declined; but the annual total in England and Wales is still about 1000. Several factors have probably contributed to the falling death-rate: the replacement of naked gas flames and paraffin lamps by electric lighting in the homes; smaller families and the consequent reduction in overcrowding; the better care of burned people which began in 1925 with the introduction of tannic acid; the declining virulence of the hæmolytic streptococcus (which was the chief cause of fatal sepsis); and the much greater control over these infections in recent years with the sulphonamides (1936) and penicillin (1942).

But, though the death-rate has fallen, it should not be assumed that the number of accidents has decreased in proportion. Unfortunately there are no data on this point. What is certain is that the accident-rate is still high—a conservative estimate puts it at 100,000 burns and scalds needing hospital treatment every year in England and Wales alone—and that these accidents, even if not so fatal as formerly, are a very serious liability to the person concerned and to the community. As *The Lancet* (1946) put it in a leading article:

> "Few calamities leave deeper scars on mind and body . . . the sum of misery to the victims and their relations is still enormous."

In a word, we have little reason to congratulate ourselves on our efforts to prevent these accidents. The open fire grate is still in every home, usually unguarded and without staples at either side of the fire to which a guard could be fixed; highly inflammable fabrics are still almost universally used for children's wear; and, whereas in the early part of this century the mother could buy a fireproofed flannelette if she could afford it, now she cannot buy it at all (see below). Moreover, new perils have come into the home, particularly the unguarded mobile electric fire and the panel gas or electric fire placed in the wall, unguarded, at precisely the height of a child's frock; and little or nothing has been done either to warn or to protect the public.

All these considerations compel us to ask: "What new approach to the problem is required, and, in the first place, what data are available to guide us?"

Some of these data have already been set out by one of us (Colebrook 1946). The report was based on the Registrar-General's returns and the early experience (1945–46) of the Medical Research Council burns unit at the Birmingham Accident Hospital. We have since carried the investigation further, analysing the first 1000 patients admitted to this burns unit from 1945 to August, 1948, including the 253 briefly considered previously by Colebrook (1946).

It has sometimes been suggested that Birmingham is exceptional in having so many of these accidents. That is not so. With the help of the Registrar-General's office and the Ministry of Health we have ascertained the death-rate per million per year (from burns and scalds) for each of the 83 county boroughs of England and Wales during 1945–47. Of the 12 boroughs with a population exceeding a quarter of a million 9 have had a higher death-rate than Birmingham —some of them more than twice as high. And of all the 83 boroughs only 19 have had a lower death-rate than Birmingham. The reason why many cities do not realise the magnitude of their burns problem has been discussed by Colebrook (1949).

Analysis of 1000 Case-records

These 1000 cases represent little more than half the burns and scalds requiring inpatient treatment in the Birmingham area. During 1945–47,* while 736 (53%) of

---

* The figures for the other five hospitals during 1948 are incomplete.

TABLE II—DISTRIBUTION OF HOME BURNS AND SCALDS IN AGE-GROUPS, SHOWING CASE-MORTALITY RATES

Home accidents	Age-group (years)				
	4 or less	5–14	15–64	65 or more	All ages
Burns	145(8)	68(3)	115(8)	32(22)	360(41)
Case-mortality (%)	*5·5*	*4·4*	*6·9*	*68·7*	*11·4*
Scalds	228(2)	49(0)	51(0)	11(1)	339(3)
Case-mortality (%)	*0 87*	*0*	*0*	*9*	*0·88*
Total	373(10)	117(3)	166(8)	43(23)	699(44)
Case-mortality (%)	*2 6*	*2·5*	*4·8*	*53·5*	*6·3*

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REVIEW OF 1000 CASES

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DURING the early years of this century both *The Lancet* 905, 1907) and the *British Medical Journal* (1910, 1912) peatedly expressed concern over the deaths from burns nd scalds, which at that time totalled over 2000 a year, 0% of them in children. Coroners also spoke strongly n the subject, calling particular attention to the danger f leaving young children alone with an unguarded fire, nd to the extreme inflammability of the then comparaively new material flannelette, which had come into ommon use because it was comfortable to wear, easy to ash, and cheap (from 2¾*d*. a yard).

In 1908–09 the Government took two steps: Parlianent inserted clause 15 in the Children's and Young ersons' Act, 1908, which made parents liable to a fine of up to £10 if a child of 7 years or under was seriously injured or died from burns or scalds caused through an unguarded *open* fire (at that time electric and gas radiants were not in general use); and the Home Office appointed a committee to report on the dangers of flannelette and on a method of fireproofing it with stannic oxide which had recently been patented by Prof. W. H. Perkin, of Manchester, in association with a firm of flannelette manufacturers.

TABLE I—COMPARISON OF HOME AND INDUSTRIAL BURNS AND SCALDS ADMITTED TO THE MEDICAL RESEARCH COUNCIL BURNS UNIT, BIRMINGHAM ACCIDENT HOSPITAL, 1945–48

Burns and scalds	Age-group (years)					Deaths	Case-mortality (%)	Stay in hospital (days)
	4 or less	5–14	15–64	65 or more	Total			
At home ..	373	117	166	43	699	44	6·3	24,402 (av. 34·9)
In industry	0	6	292	3	301	4	1·3	10,180 (av. 33·8)
Total ..	373	123	458	46	1000	48	4·8	34,582 (av. 34·5)

Neither of these steps was effective. Magistrates were reluctant to add to the burden of parents whose child had died; and in any case prosecutions were rare. Of twelve prosecutions reported in the *Times* in 1909 under the new Act only one was for neglect to provide a fireguard. In practice, therefore, clause 15 was a dead letter from the start, and today many parents do not even know it is still law. The flannelette inquiry was also abortive, but for reasons difficult to understand (see below).

The war of 1914–18, which broke out soon after the committee's report was issued, brought much graver dangers to the nation, and the deaths of children from burning were forgotten. Since then, the number of deaths, particularly from burns, has steadily declined; but the annual total in England and Wales is still about 1000. Several factors have probably contributed to the falling death-rate: the replacement of naked gas flames and paraffin lamps by electric lighting in the homes; smaller families and the consequent reduction in overcrowding; the better care of burned people which began in 1925 with the introduction of tannic acid; the declining virulence of the hæmolytic streptococcus (which was the chief cause of fatal sepsis); and the much greater control over these infections in recent years with the sulphonamides (1936) and penicillin (1942).

But, though the death-rate has fallen, it should not be assumed that the number of accidents has decreased in proportion. Unfortunately there are no data on this point. What is certain is that the accident-rate is still high—a conservative estimate puts it at 100,000 burns and scalds needing hospital treatment every year in England and Wales alone—and that these accidents, even if not so fatal as formerly, are a very serious liability to the person concerned and to the community. As *The Lancet* (1946) put it in a leading article:

> "Few calamities leave deeper scars on mind and body . . . the sum of misery to the victims and their relations is still enormous."

In a word, we have little reason to congratulate ourselves on our efforts to prevent these accidents. The open fire grate is still in every home, usually unguarded and without staples at either side of the fire to which a guard could be fixed; highly inflammable fabrics are still almost universally used for children's wear; and, whereas in the early part of this century the mother could buy a fireproofed flannelette if she could afford it, now she cannot buy it at all (see below). Moreover, new perils have come into the home, particularly the unguarded mobile electric fire and the panel gas or electric fire placed in the wall, unguarded, at precisely the height of a child's frock; and little or nothing has been done either to warn or to protect the public.

All these considerations compel us to ask: "What new approach to the problem is required, and, in the first place, what data are available to guide us?"

Some of these data have already been set out by one of us (Colebrook 1946). The report was based on the Registrar-General's returns and the early experience (1945–46) of the Medical Research Council burns unit at the Birmingham Accident Hospital. We have since carried the investigation further, analysing the first 1000 patients admitted to this burns unit from 1945 to August, 1948, including the 253 briefly considered previously by Colebrook (1946).

It has sometimes been suggested that Birmingham is exceptional in having so many of these accidents. That is not so. With the help of the Registrar-General's office and the Ministry of Health we have ascertained the death-rate per million per year (from burns and scalds) for each of the 83 county boroughs of England and Wales during 1945–47. Of the 12 boroughs with a population exceeding a quarter of a million 9 have had a higher death-rate than Birmingham —some of them more than twice as high. And of all the 83 boroughs only 19 have had a lower death-rate than Birmingham. The reason why many cities do not realise the magnitude of their burns problem has been discussed by Colebrook (1949).

Analysis of 1000 Case-records

These 1000 cases represent little more than half the burns and scalds requiring inpatient treatment in the Birmingham area. During 1945–47,* while 736 (53%) of

TABLE II—DISTRIBUTION OF HOME BURNS AND SCALDS IN AGE-GROUPS, SHOWING CASE-MORTALITY RATES

Home accidents	Age-group (years)				
	4 or less	5–14	15–64	65 or more	All ages
Burns	145(8)	68(3)	115(8)	32(22)	360(41)
Case-mortality (%)	*5·5*	*4·4*	*6·9*	*68·7*	*11·4*
Scalds	228(2)	49(0)	51(0)	11(1)	339(3)
Case-mortality (%)	*0·87*	*0*	*0*	*9*	*0·88*
Total	373(10)	117(3)	166(8)	43(23)	699(44)
Case-mortality (%)	*2·6*	*2·5*	*4·8*	*53·5*	*6·3*

Deaths, included in totals, are shown in parentheses.

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* The figures for the other five hospitals during 1948 are incomplete.

these injuries were admitted to the Accident Hospital, a further 624 (45%) were admitted to the other five large general hospitals—Dudley Road Municipal Hospital, Selly Oak Municipal Hospital, Children's Hospital, General Hospital, and Queen Elizabeth Hospital—and it may be assumed that a few more, probably not less than 30 (2%), were admitted to other hospitals in the area. In the period under review about 3000 further patients received outpatient treatment at the Accident Hospital for burns or scalds.

PLACE OF ACCIDENT, AGE, AND SEX

The number of burns and scalds resulting from accidents in or around the home was 699 (70%), compared with 301 (30%) industrial accidents; and the case-mortality rate was also much higher in the group of home accidents: 6·3% compared with 1·3% (see table I). Birmingham is a city of very varied industries, many of which involve the use of molten metals and a consequent heavy risk of burns to the workers. Probably in many less industrialised communities the preponderance of home burns and scalds would be even greater.

Injury from burns and scalds fell far more heavily on children than on any other class. Table II shows that of the 699 accidents in or around the home 373 (53%) happened to children under the age of 5 years, and 490 (70%) to children under 15 years. When these totals, and those for adults, are related to the estimated mean population for the same age-groups (taking the national figures for 1935–39 as about correct), the incidence of burns and scalds per 10,000 of the population of Birmingham is as follows:

For children aged under 5 years	49·5
„ „ „ 5 to 14 „	7·5
„ adults „ 15–64 „	5·0
„ „ „ 65 or more years	4·8

TABLE III—DISTRIBUTION OF HOME BURNS IN RELATION TO NATURE OF ACCIDENT

Nature of accident	Age-group (years) and sex										Total	Case-mortalit (%)
	4 or less		5–14		15–64		65 or more		All ages			
	M	F	M	F	M	F	M	F	M	F		
Direct or indirect contact with domestic fire:												
Coal, unguarded	25(1)	22(2)	5	11(2)	17(1)	11(2)	2(1)	9(6)	49(3)	53(12)	102(15)	
Coal, guarded	3	4	..	..	..	1	..	..	3	5	8	
Electric, unguarded	6	9	5	7(1)	1	6(3)	..	4(3)	12	26(7)	38(7)	
Electric, guarded..	1	..	..	..	..	..	..	..	1	..	1	
Gas, unguarded	6(1)	8(1)	..	..	1	10	..	5(1)	7(1)	23(5)	30(6)	
Gas, guarded	..	..	1	..	..	..	..	..	1	..	1	
Type unspecified	..	1	..	..	1	2	1(1)	4(3)	2(1)	7(3)	9(4)	
Total	41(2)	44(3)	11	18(3)	20(1)	30(5)	3(2)	22(16)	75(5)	114(27)	189(32)	17
Principal other causes:												
Inflammable liquids	1	1	9	1	12	10(1)	..	..	22	12(1)	34(1)	
Fires outside house (bonfires, ash-pits, fireworks, &c.)	3	1	12	3	5	1	..	..	20	5	25	
Electrical burns	5	2	1	..	4	3	..	1(1)	10	6(1)	16(1)	
Hot fat	4	3	..	3	..	4	..	1	4	11	15	
Fall against hot metal or ashes..	..	6	1	1	1	3	1	..	3	10	13	
Miscellaneous (gas ovens, matches, cigarettes, hot pokers, conflagrations, &c.)	14(1)	20(2)	3	5	9	13(1)	1	3(3)	27(1)	41(6)	68(7)	
Total	27(1)	33(2)	26	13	31	34(2)	2	5(4)	86(1)	85(8)	171(9)	5
Grand total	68(3)	77(5)	37	31(3)	51(1)	64(7)	5(2)	27(20)	161(6)	199(35)	360(41)	11

Deaths, included in totals, are shown in parentheses.

Scalds were rather more common than burns among the very young children, but they produced less severe injuries and were rarely fatal. The case-mortality rate for burns in children under the age of 5 years was 5·5%, but for scalds only 0·87%. The proportion of boys to girls scalded was 3 to 2.

Among patients aged 65 years or more, burns were three times as common as scalds; the proportion of women to men was 5 to 1. The case-mortality rate for burns among these older people was 68·7% (74% for wom and 40% for men; see table II).

BURNING ACCIDENTS IN THE HOME

Of the 213 burning accidents to children under th age of 15 no less than 114 (53%) resulted from dire or indirect contact with heating appliances, such a open coal fires and gas and electric radiants (table III Of these 114 accidents 104 (91·2%) occurred when guard was on the fire; in a further 3 cases the being unfixed, was removed by the child. In a fur 7 cases the children's clothing was ignited when lighted gas oven was left open to warm the room. In 3 of these cases the children were still in their night cloth (all of flannelette or winceyette) at about 10.30 A.M.

Of the 32 burning accidents to people aged 65 or more at least 20 (62·5%) occurred when no guard was on th fire; and it is significant that in 9 of the 20 accidents this group of which we have full information an unguarded gas or electric radiant was responsible for the injury. Children and old people appear to stand in particular danger from these types of heating appliance (table III).

The design of the clothing of elderly women, as well as (sometimes) its inflammability, together with the greater preoccupation with cooking, tending the fire &c., were presumably responsible for the much high incidence of burns sustained in this age-group compared with men of the same age (22 to 3; see table III).

Among the burning accidents which were *not* due t contact with a heating appliance the most importan groups were those attributable to the improper use o inflammable liquids, usually petrol or paraffin, and thos caused by fires outside the home—ashpits, bonfires fireworks, &c. (table III). Only 2 patients came to th hospital from a house on fire, and both recovered. A first we thought that many more might have received fatal burns in conflagrations and were not brought to th hospital, but inquiry showed this not to be so. It may be noted also that in the Registrar-General's Returns 1900–39 the deaths due to conflagrations amount to only 3% of the total—2682 out of 78,911.

Of the 360 home burns admitted, 134 (37%) resulted from the clothes catching fire; and usually † the gar

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† Unfortunately the records did not always include a precis statement on this point, but our impression is that the garments burned were of flannelette or winceyette in at least three-quarters of the cases. Complete records are now being kept.

TABLE IV—PROPORTION AND DISTRIBUTION OF CASES IN WHICH CLOTHES CAUGHT FIRE

re of accident	Age-group (years) and sex										Total	Case-mortality (%)	Stay in hospital (days)	Average stay per patient (days)
	4 or less		5–14		15–64		65 or more		All ages					
	M	F	M	F	M	F	M	F	M	F				
urns	68(3)	77(5)	37	31(3)	51(1)	64(7)	5(2)	27(20)	161(6)	199(35)	360(41)	11	13,858	38
caught fire :														
unguarded ..	6(1)	13(3)	10	16(3)	3(1)	16(5)	1(1)	16(13)	20(3)	61(24)	81(27)	33	4814	59
guarded ..	2	1	..	..	..	..	..	..	2	1	3	..	92	30
causes† ..	9(2)	10(2)	5	4	10	9(2)	..	3(3)	21(2)	26(7)	50(9)	18	2345	47
Total ..	17(3)	24(5)	15	20(3)	13(1)	25(7)	1(1)	19(16)	46(5)	88(31)	131(36)	27	7251	54

Deaths, included in totals, are shown in parentheses.

se 3 accidents happened as follows:
A spark from a fire set alight a child's clothing.
A child removed the guard standing before an electric fire.
A child's clothes and perambulator cover were ignited by clothes airing at the fire.

se included: inflammable liquids 11, fires outside the house 9, lighted gas oven used to warm room 8, matches 7, lit paper, &c., 4, igarette 4, candle 2, log taken out of gas oven ignited cotton apron 1, gas stove 1, and cause unknown 3.

ignited were of cotton material, such as flannelette, ette, print, &c. (table IV).

le IV shows that all age-groups contain many females than males burned by contact of their ig with an unguarded fire. In those aged 65 or he ratio was 16 to 1. The 81 victims of the acci- associated with an unguarded fire had a decidedly death-rate than those whose clothes were ignited ier means. The average stay in hospital was also —and it has to be remembered that in most of fatal cases (included in the total of 81) the victims ithin a few days of the accident; otherwise the ge stay in hospital of this group would have been still.

SCALDING ACCIDENTS IN THE HOME

339 scalding accidents in the home by far the number—228 (67%)—involved children under e of 5 years; and of these 228 scalds in children curred when the child pulled or knocked over a or cup of tea or a container of other scalding put down within its reach. A further 35 accidents ldren under the age of 5 years were caused by buckets, wash-tubs, &c., left on the floor (see v).

PART PLAYED BY EPILEPSY

epsy was an important ancillary factor in the tion of home burns. Of the 209 adults burned or d 35 were epileptics, the accidents happening during In all these 35 cases the diagnosis of epilepsy was d by the history. Several other patients whose nt coincided with a "fainting fit" or a "turn" ho had not a clear history pointing to epilepsy iot included. In 29 of the 35 burning accidents ing epileptics no fire-guard was in use at the time.

ASSESSMENT OF PREVENTABILITY

en reasonable care and foresight on the part of lult concerned, whether victim or guardian (see table VI), 55% of the home burns and 44·5% of the home scalds are judged to have been preventable. It is fully realised that any assessment of preventability is beset with difficulties. Too little allowance may have been made for the peculiar circumstances in which the responsible adult was placed at the time of the accident; and, on the other hand, fuller acquaintance with those circumstances might sometimes show the seemingly "pure-chance" accident to have been easily preventable. Broadly speaking, we have regarded the burning accidents associated with the unguarded fires as preventable (except when the guard had been temporarily removed for making up the fire), because these accidents were almost always due to momentary contact with the source of heat, a contact which could not have happened if a guard had been in place. It is noteworthy that 62·5% of the burns of old people were of this kind. By contrast, the setting alight of a child's frock by a spark shot out from a coal fire was regarded as "not easily preventable"; and so was the burn due to the splashing of hot fat. But the pulling over of a container of hot fat, put within the reach of a young child, has been taken as "preventable."

The scalds of young children were judged to be preventable if a teapot or cup of hot liquid was knocked or pulled over by the child (because it could usually have been put out of the child's reach), but it was judged "not easily preventable" if the accident was due to a mother slipping—or to a child running into her—while she was carrying a saucepan or kettle. Again, the accident was usually judged "preventable" if a young child fell into a bath or bucket of hot water left on the floor while the mother went to fetch the soap, &c.; but "not easily preventable" if an older child or adult tripped or fell into hot water.

We have included 36·4% of all the burns and scalds in the "not easily preventable" class. The "unclassifiable" group (13·6%) was composed of the accidents of which the particulars obtained were insufficient to allow of any opinion.

TABLE V—DISTRIBUTION OF HOME SCALDS IN RELATION TO NATURE OF ACCIDENT

Nature of accident	Age-group (years)					Case-mortality (%)	Stay in hospital (days)
	4 or less	5–14	15–64	65 or more	All ages		
lled or knocked over by patient ..	80	10	..	..	90	..	2641 (av. 29·3)
ers of other scalding liquids pulled or ked over by patient	62	17	..	..	79	..	2763 (av. 34·9)
&c., left on floor	35(2)	7	..	..	42(2)	4·8	1171 (av. 28)
auses	51	15	51	11(1)	128(1)	0·7	3969 (av. 31)
Total	228(2)	49	51	11(1)	339(3)	0·8	10,544 (av. 31)

Deaths, included in totals, are shown in parentheses.

TABLE VI—ASSESSMENT OF PREVENTABILITY OF HOME BURNS AND SCALDS

Assessment	Burns		Scalds		Total	
	No.	% of total cases	No.	% of total cases	No.	% of total cases
Preventable ..	198* (8409)	55·0	151† (4895)	44·5	349 (13,304)	49·9
Not easily preventable	124 (4155)	34·4	131 (4090)	38·6	255 (8245)	36·4
Unclassifiable..	38 (1294)	10·6	57 (1559)	16·8	95 (2853)	13·6
Total ..	360 (13,858)		339 (10,544)		699 (24,402)	

Days of occupation of hospital beds are shown in parentheses.

* Of these 198 burns (representing 6905 days in hospital), 152 were associated with unguarded fires.

† Of these 151 scalds, 116 (representing 1706 days in hospital) resulted from the upsetting of tea or other hot fluids (all the patients were children) and 34 from the leaving of baths, &c., on the floor.

EXPENDITURE OF HOSPITAL SERVICES

In spite of the exceptionally favourable facilities for the treatment of burns and scalds at the Birmingham Accident Hospital the 1000 cases under investigation involved the occupation of hospital beds for no less than 34,582 days (24,402 for home accidents and 10,180 for industrial).

Table IV shows that the burns due to contact of clothes with unguarded fires involved the longest stay in hospital (59 days average) and the highest case-mortality rate. As was remarked above, the average stay in hospital would have been considerably longer if the patients who died—usually within a few days—had survived.

It is noteworthy too that the group of scalds among children under the age of 5 years accounts for a large proportion of the occupancy of hospital beds.

It is seen too that, if the home burns and scalds judged to have been preventable had been prevented, this occupancy of beds would have been reduced by no less than 13,304 days (349 cases). In terms of the whole country such a reduction would amount to something like 300,000 bed-days, possibly more. And these figures take no account of the casualty and outpatient services rendered to a very large number of patients.

Prevention

Very briefly, the data summarised above point to the following four chief conclusions:

(1) There are considerable risks from fire and hot water—many of them avoidable risks—in the modern English home.

(2) These risks are greatest for young children before they have developed "heat sense."

(3) Special risks are associated with the clothing of girls and women.

(4) Burns and scalds—apart from their cost to the persons concerned—make heavy demands on hospital services.

Attempts to reduce the number of these accidents in the past have too often been along a single track—e.g., by focusing on the neglect of fire-guards or on the dangers of flannelette. We believe that the attack should be from several different directions simultaneously, recognising that many factors contribute to each mishap. All of the following may be expected to have some effect—some more, some less. Together they might well reduce the number of these accidents within a few years to half the present figure.

(1) *Education and propaganda* by film, radio, the press, exhibitions, posters, demonstrations and talks in women's institutes, community centres, schools, &c., and, perhaps most important of all, by the continued personal effort of doctors, welfare workers, district nurses and visitors, and the staffs of postnatal and health centres.

(2) *Better houses and living conditions:* the elimin overcrowding. Too often the children can only play the fire in the living-room.

(3) *The freeing of women from industry* to look a homes and children.

(4) *Safer methods of heating houses:* by contra perhaps, district heating and by the wider use of coal fires (of the 'Aga' type) and convector types of fires.

(5) *The wider use of uninflammable materials* clothing of girls and women.

(6) *Better design of guards for coal fires* and facili fixing them in place, so that children cannot remove

(7) *Better design of gas and electric fires* adequately

(8) *Better design of teapots and cups and of cooking* rendering them less easy to upset.

In planning this preventive campaign it wil helpful first to consider some of its more impo elements separately.

CIRCUMSTANCES LEADING TO SCALDS

Scalding accidents, to which very young childre particularly liable, are too often due to a lack of aw ness of the danger on the part of the mother. She not learnt to be on her guard instinctively, as she down the cup or pot of tea, lest the baby's arm sh fly up and knock it over, and to place it on the habitually well out of the baby's reach. She has realised—or she forgets—that the toddler playing o floor is very likely to grab hold of the corner of the t cloth, bringing the teapot crashing down over him and that the slightly older inquisitive boy is likel catch hold of the handle of the saucepan and upse

These accidents and many others of a similar kind w be less frequent if the tea-cups and teapots had broad base rather than the incurved one; and si improvement in design of other cooking utensils w make for safety.

But a wisely directed and persistent campaig education and propaganda will probably be most effe in preventing this kind of mishap.

BURNS ASSOCIATED WITH HEATING APPLIANCES

Open Coal Fire

This is still the outstanding hazard of the En home. The experience of Birmingham suggests that responsible for nearly 300 deaths and 2000 non- injuries, severe enough to require admission to hospi in England and Wales alone each year. In the distant future this hazard is likely to grow less import In spite of the Englishman's traditional attachment his open fire the paramount need for economising and saving labour will probably lead to consider development of central and district heating. Ele and gas fires and cookers have already taken the p of coal in many homes and are likely to continue t so in many more.

It is difficult to see how the open coal fire can be made safe. Much might have been done—and m still be done—by the better design of fire-guards; the fire-guard will always have to be removed for sto the fire and for cooking; and it will always be diff to prevent the adventurous child from removing it w the mother is out of the room (unless the fire-gua padlocked). The provision of staples in the wall on e side of the grate to which the fire-guard can be atta is long overdue. We understand that at present in m council houses a tenant, even with young childre not allowed to put such staples in without see permission; and often to put them in is not a si matter after the fireplace has been built. We sugges local authorities that such staples should be include routine in all new houses to begin with, later to be ad in all existing council houses.

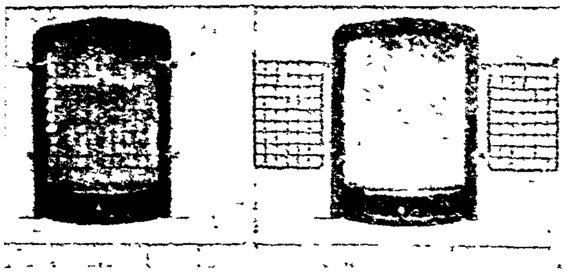

Fig. 1—Hinged fire-guard for open fire.

Ve also suggest for consideration the merits of a guard rporated in the open fire grate, either in the form of nged gate, as shown in fig. 1 (an experimental model le for us by Mr. Hartley, a builder, of Wexham. ugh), or in the form of a built-in guard of which the els can be pulled out from the walls when required. uard of the second type has been designed by Mr. W. J. rthington, a Birmingham architect, and is being rketed by Messrs. Metalcraft, also of Birmingham.

ELECTRIC AND GAS RADIANTS

The importance of these fires (especially the electric) a source of burns has steadily increased during the t fifteen years. Though electric fires were in short ply during the recent war, great numbers of them ne on to the market and were widely bought during hard winter and the coal crisis of 1947. Most of the ctric fires are mobile and of light construction; hence y can easily be knocked over. The heat in the immedi- vicinity of the naked element is usually much greater n that of the yellow flame of a coal fire; hence contact ting only 1–2 sec. with an inflammable material is ficient to set it burning fiercely. Though many are ed with one or more bars to safeguard the element, y few carry a guard designed to prevent a frock or ht-dress *from touching the element*—an omission ich has undoubtedly led to hundreds of deaths. At a ent visit to the Ideal Home Exhibition in London we nted 28 of these inadequately guarded, and therefore safe, fires to 8 safe types.

We call particular attention to the great danger of the nel type of electric and gas fire flush with the wall standing a few inches away from it and usually at t the height of a child's frock. In our own limited perience very terrible burns have already been caused these fires, which could so easily be made safe by the dition of a small guard at the time of manufacture. is should be made compulsory.

There are no data about the total number of accidents roughout the country caused by electric and gas fires recent years, but our experience in Birmingham ring 1945–48 leads us to the conclusion that the figure England and Wales in each of these years is likely have been at least 1400, with nearly 250 deaths. The e figures may well have been considerably higher.

When these facts have been presented to the manu- cturers of these fires (as they have been on several casions during the past three years), we have usually en met with the contention that any guard would tract from the appearance and efficiency of these aters, and therefore from sales. Tests of efficiency ve shown conclusively that a light guard at a few ches from the element makes very little difference to e radiation effect. And a well-designed guard need not tract from the appearance. In the matter of sales lue, possibly if the public were plainly told of the nger of these unguarded fires the provision of safe- ards would quickly come to be a selling feature. It ight even earn dollars. And, if the manufacturers will not show themselves sufficiently concerned about the public safety, the sale of these fires should be subject to specific safety regulations analogous to those which protect the public against the indiscriminate sale of dangerous drugs and poisons.

Gas "Pistol"

With many of the newer gas cookers a "pistol" lighter can be purchased. This "pistol" tucks loosely into a loop of metal at the side of the cooker, and is within the reach of a child. A child can easily depress the small knob which releases a long jet of flame from the barrel. There is real danger that a child may at some time blind a playmate. We suggest that this "pistol" should never be installed at oven height but should always be hung well above the cooker; as a further safeguard, the loop could be made to fit more tightly, making it difficult if not impossible, for a small boy to detach the "pistol."

HEATING APPLIANCES BURNING PARAFFIN OR OTHER LIQUID FUELS

Improved designs of these fires are coming on the market and will present their particular problem. Their manufacture and sale should also be subject to appropriate safety regulations.

INFLAMMABLE CLOTHING MATERIALS

"Clothing caught fire" was the story behind most of the serious injuries. In our series it was responsible for 36 of the 41 deaths due to burns in the home: and the average stay in hospital for those who survived was 72 days as compared with 34·8 for all burns and scalds. The striking difference between the sexes, as regards number of cases and of deaths (tables III and IV), clearly suggests that the clothing of the female children and older women (in association with unguarded fires) exposes them to a much greater risk than does that of males. And that suggestion is strongly confirmed when we consider the inflammability of the clothing materials in common use, and the design of female clothing.

To anyone who has exposed a piece of woollen material and a piece of flannelette to a match or candle flame or to the element of an electric heater there is no need to labour this question of *inflammability*. The woollen material smoulders with a red glow, withdraws from the source of heat, and goes out. The flannelette burns like a torch, and the material is usually completely destroyed within a few seconds. But so many people of all classes seem to be unaware of this great difference that we add the results of a few tests made with various clothing materials.

Following the procedure of *The Lancet* (1911) laboratory we have applied a small flame, not to the cut edge of the material under test (which tends to exaggerate its inflammability), but to a point about 1 in. above the edge. Since we had to work with a vertical flame (of a night-light), the material in our test was conveniently held, at an angle of about 40° from the horizontal, on a piece of wire netting. Under these conditions ignition of the material was a little less rapid and complete than it would have been in the vertical position.

The point of the small flame (about 13 × 3 mm.) was brought up to the material for 6 sec. and then promptly removed; 15 sec. later the burning (if any) was quenched by applying sheets of felt firmly above and below the wire netting. (The 6 sec. exposure to the flame was a little longer than was necessary. With 3 sec. exposure ignition of the material was uncertain; with 4 sec. it started, sometimes a little sluggishly.)

The materials tested were all of recent manufacture except the silk. They were acquired in the retail market. Most of them had not been washed. Their dryness was ensured by exposing them for several hours before testing 2–3 ft. from a coal fire. Samples tested were 3 in. square.

The results were as follows:

Test no.	*Material*	*Result*
1	Standard flannelette *	Visible flame 3–4 sec. from start, which spread rapidly, destroying 75% of the material within 15 sec.
2	Flannelette from retail market, good quality	As above
3	Winceyette retail market, poor quality	As test 1, 70% destroyed
4	Winceyette (white) retail market, better quality	As test 1, 75% destroyed
5	Winceyette (another sample, coloured)	Ignition slightly slower, 40% destroyed
6	Ditto	As test 5, 45% destroyed
7	'Dayella' (mixture of cotton and wool) retail market	As test 1, burning not quite so fierce, 60% destroyed†
8	Ditto (repeated)	As test 1, flamed fiercely; 90% destroyed
9	'Viyella' (mixture of cotton and wool)	*As test 1, 50% destroyed*†
10	Rayon	Ignited but did not burn quite so fiercely as the previous tests, 50% destroyed
11	Woollen fabric (knitted)	This was held vertically and flame held to cut edge for 15 sec., no ignition, and no destruction of material
12	Black silk (pre-war quality)	Test as no. 11, did not flame, a red glow developed at one point but went out immediately flame was removed, destruction almost nil
13	'Nylon' (two samples)‡	Melted round the source of heat but there was no flame and no spreading destruction

* Made to Specification No. 3012 issued by the Cotton Board on behalf of the Board of Trade 1942.

† When tested with an electric fire these two materials ignited suddenly at 3–4 sec. with a slight explosion.

‡ A third sample, sold as nylon, burned freely, but was found on microscopical examination to be a mixture of nylon and cotton.

It is clear from tests 1–6 that all the samples of raised cotton materials were highly inflammable; and it may legitimately be inferred that any garment made of these materials which remained in contact with a naked flame *or with the element of an electric or gas fire for 4–6 sec.* would have burned equally readily, particularly if it stood away from the wearer's body, and if the wearer was upright and created currents of air by moving. The chances of escaping a severe burn when so clad must be slight.

By contrast with these results with cotton fabrics, it proved almost impossible to set alight wool and silk fabrics with the small flame used in these tests. These materials may be regarded as virtually uninflammable, though the woollen material tested could be made to burn fiercely by contact with an electric fire for 30 sec.

It was somewhat surprising and disappointing to find that the fabrics containing a mixture of wool and cotton, which are much used at present by all classes of the community, were almost as inflammable as the raised cotton materials, though slightly less ready to catch alight at first. Interlock, a knitted cotton material, which has the advantage that garments made from it do not stand away from the body, was in the same category. Rayon too was moderately inflammable.

Two of the three fabrics sold as nylon differed from all the others in that they melted but did not burn.

We were unable to compare the inflammability of these modern materials with that of the fabrics available in 1910, and probably more refined methods of testing would have been necessary to determine any small differences. Judging from the published accounts of tests carried out by the British Fire Prevention Committee in its Red Book No. 148 and by *The Lancet* (1911) laboratory, the results obtained were very similar; and the safety coefficient of the materials in common use has not appreciably improved.

THE HOME OFFICE INQUIRY OF 1908–10

The cotton fabrics with the raised nap have come into such general use by all classes of the community (especially those in the poorer homes, where the fire hazard is greatest) during the past sixty years ‡ that it is imp to discuss the problem of clothes catching fire wi special reference to these materials. Nor can one these materials without special reference to the Office inquiry of 1908–10, because the results of inquiry have *a direct bearing on the incidence of* today.

The proceedings of this committee and its fin are not readily accessible today because they are of print, and are available in very few libraries. B they deal with many questions which will certainly to be discussed afresh, we discuss them here in detail. (The evidence will be found in the *Second R of the Departmental Committee on the Law relating Coroners, 1910*; and the final report in vol. XX *Reports of Commissioners, Inspectors and others* publ by the Stationery Office in 1910.)

The committee was primarily concerned with different matter—i.e., the law relating to coroners—in view of the great increase of children's deaths burning since the introduction of flannelette (an incre apparently of 62% for children under the age of 5 yea *it was asked to consider whether any action sho* be taken and, in particular, about the merits certain uninflammable materials which were attract attention.

From the evidence submitted the committee a with the view expressed by many coroners and surg that the high inflammability of flannelette was a ma contributory factor in many burning accidents, but also emphasised the important parts played by absence of fire-guards, carelessness with regard to matc candles, &c., and frequent failure to keep a proper w over young children in the home. It decided that th were no reliable data about the proportion of burn accidents for which flannelette was chiefly to blame. did not favour a system of compulsory marking flannelette which would warn the public of the dan arising from its inflammability.

It considered at some length the merits of a process fireproofing flannelette by impregnation with sta oxide, which had been introduced and patented Prof. W. H. Perkin, F.R.S., in 1902. Material so proo had been on the market for a few years under the n 'Non-Flam,' and several million yards of it had produced at the time of the inquiry. The uninfla bility of this material (which is well illustrated in was amply established by the evidence of Sir T Thorpe, director of the Government laboratory, a independent investigations carried out by the Fire Prevention Committee and published i Red Book No. 148; and by another committee, co of Prof. Sims Woodhead, Sir William Ramsay, P Pope, Dr. Kelynack, and Mr. J. C. Cain, of the Che Society.

Sir Thomas Thorpe's evidence showed that its u flammability was slightly reduced by the first was but scarcely at all by *subsequent washings. It was* established that the fireproofing process gave the mat any properties which rendered it unsuitable for ma into garments. In the committee's summing up not is said about any such disadvantages but, for s reason which is not clear to the reader today, it st that the non-flam process did not appear to be *f* satisfactory (italics by the committee).

In forming this conclusion the committee was ap ently influenced by two considerations: (1) that proofed material had not already established itself public favour as an alternative to the *ordinary flannele*

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‡ Since about 1945 the pure cotton materials have been in s supply for the home market and their price has grea increased. In consequence the demand for mixed cotton wool fabrics, and pure wool, has increased, but, as shown abo the safety coefficient of the mixed materials is not great improved.

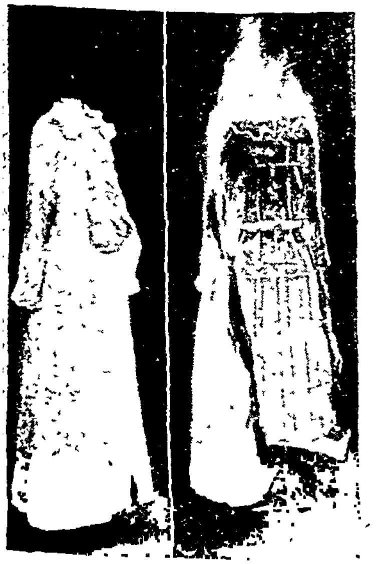
(2) that its price was higher than that of the roofed flannelette and therefore it had not been, would not be, bought by a large part of the popula-. As regards (1) the evidence given to the committee ws that there was strong opposition within the cotton le to the introduction of non-flam (which was tected by patent rights). Professor Woodhead ribed to the committee the reluctance of retailers to him non-flam though they had it in stock. If this ctance was general, and was possibly prompted by manufacturers of the unproofed fabrics, it would go to explain the fact that non-flam had not won popular our. And no doubt the price charged to the public l also played a part. It was not clear from the evidence mitted how much more the retail buyer was asked to for the proofed material compared with the same terial unproofed (there were several grades of proofed flannelette on the market, ranging from l. to 8¾d. a yard). It may well be that exorbitant ces were sometimes asked for non-flam. The cost of oofing was apparently from ¾d. to 1d. a yard, but tnesses explained that some additional charges would ve to be made for advertising and selling it.

It seems probable that, if the committee had represented to the Government that the wide use of proofed brics was essential for the saving of child life, and that ofessor Perkin's process provided such a satisfactory oofed material, the difficulty of price could have been ercome by negotiation with the manufacturers; and at, if due publicity had been given to the advantages using the safe material, it would quickly have come to popular favour—at least with a large part of the ople.

If that had happened, it is likely that the lives of some ousands of children would have been saved in these tervening forty years, and many more spared the rrible results of non-fatal injuries.

As it was, the committee contented itself with the commendation that the public should be protected ainst the sale of fabrics which were alleged to be eproof but were not—at any rate after being washed. ffect was given to this recommendation after three years by the Fabrics (Misdescription) Act, 1913. In concluding its report the committee said:

> "Legislation of the kind suggested is the less justifiable in view of the fact that matters may, in course of time, be expected to right themselves. Great improvements have already been made in the manufacture of flannelette, and further improvement may be anticipated. New and cheaper methods of diminishing the inflammability of the material may be discovered."



g. 2—Tests of inflammability: (a) flannelette fireproofed with stannic oxide, at 120 sec; (b) ordinary flannelette, at 60 sec. A lighted taper or spirit-lamp was applied to bottom edge of garment for not less than 15 sec. or more than 20 sec. Similar results to those in (a) were obtained with non-flam after it had been washed and *dried twenty times*.

Today, forty years later, matters have not righted themselves. In spite of anticipated improvements in the manufacture of flannelette it remains highly inflammable—indeed we know of no evidence that this danger has been reduced at all. Some new methods of fireproofing have been discovered, but, so far as we are aware, none has yet proved better than the stannic-oxide process. Actually progress has been backward. Forty years ago a mother could at least buy an uninflammable cotton garment if she was prepared to pay a little more for it; today she cannot.

Looking back on the work of this committee it is difficult to resist the conclusion that it was singularly ineffectual. If there were reasons why non-flam should not be widely used by the public for clothing, the committee entirely omitted to present those reasons. If, on the other hand, that material provided the way to safer clothing for millions of women and children, the committee, by omitting to represent that to the Government, lost a great opportunity of saving life and of preventing an incalculable amount of suffering.

It is not easy to discover what was the subsequent history of non-flam. In 1912 it was awarded the £50 prize offered by the *Daily Express* for the safest cotton material. And in 1913 the patents covering its production were revoked by consent so that after that time it could have been taken up by other manufacturers. Was it killed by the Home Office committee's omission to represent that it was at least an important step in the right direction, or by the opposition of the cotton trade, which was evidently much concerned at that time about the effects of the inflammability scare on the sales of flannelette? (It should be noted that the name "winceyette" has gradually taken the place of "flannelette," but, as we have shown, the difference in inflammability is practically nil.) Or was the process dropped during the war of 1914–18 because of the shortage of tin? or did it fail to survive because the nation was too preoccupied with the tragedy of the war to bother much about lesser things? Whatever was the fate of non-flam, there can be no doubt that the possibility of proofing flannelette and kindred wearing materials should be reconsidered without delay in the light of present knowledge.

Recent investigations at the Royal Aircraft Establishment on similar problems in relation to fire hazards in the Services have yielded some data on the various processes by which fireproofing can be effected. Using 'Aero Cotton' (a fabric of different texture from flannelette but of similar weight) as their test material, Ramsbottom (1947) found that impregnation with stannic oxide had two disadvantages: it caused serious deterioration of the fabric after protracted exposure to sun and air; and the inflammability of the proofed material was regained after boiling for 30 minutes. Whether flannelette is affected in the same way as aero cotton we do not know—no such changes were reported to the Home Office Committee—but clearly such effects must be looked for in any new investigation.

Fresh light has also been thrown by the R.A.E. investigation upon the mechanism by which some of the older methods of fireproofing achieved their results. It may well be that this in turn will point the way to quite different and more successful processes.

Whatever process is ultimately adopted it is likely to add something to the cost of production of the materials; but it is probable that, if the dangers of ordinary flannelette and the merits of a proofed material were made known to the public by a Government sincerely concerned to prevent these burning accidents, the great majority of mothers would gladly pay the extra few pence in the interest of safety.

In this matter of cost it may be well to remind ourselves of the price we have paid in the last forty years since the fireproofing of flannelette became (apparently) a practical *proposition.* There are *no reliable data*—and probably not all would agree about the apportionment of the blame in some cases—but our own continual contact with burning accidents through several years leads us to the conclusion that not less than 100 children in England and Wales each year owe their deaths primarily to the fact that the garment they were wearing could *easily* catch alight by touching a fire. If that is true it means that in these forty years we have lost at least 4000 children (and the correct figure would probably be higher). For each one who has died there have been at least five times as many who have suffered the terrible experience of large septic, slowly healing, burns, and have ultimately recovered with greater or less permanent disability. There must have been at least 20,000 of these unfortunate children. Is this *to go on for another forty years* before we take steps to see that children are clothed in safer materials?

SUMMARY

Analysis of 1000 consecutive admissions to the Medical Research Council burns unit, Birmingham Accident Hospital, of patients with burns and scalds has shown that 70% of the patients had been injured by an accident in or around the home, and only 30% at the place of work; 70% of the home accidents happened to children, those under the age of 5 years being most affected.

About half of all the home accidents were judged to have been preventable—i.e., they would not have happened, given reasonable care and foresight on the part of the adult concerned.

The expenditure of hospital services on these accidents was very heavy. The 1000 cases, in spite of exceptionally favourable circumstances for their treatment, occupied beds for no less than 34,582 days. If the home accidents judged to have been preventable had been prevented, this occupancy of beds would have been reduced by 13,304 days.

It is estimated that in England and Wales alone each year injuries of this kind must require at least 1,000,000 hospital bed-days.

The association in the home of a naked source of heat and highly inflammable garments worn by women and female children and the younger boys is still the ultimate cause of the most serious accidents, *as it was in 1908* when the Home Office Committee inquired into the matter.

An examination of the proceedings and report of that committee leaves a strong impression that a great opportunity was lost at that time to substitute for the almost universally used inflammable flannelettes similar materials rendered uninflammable. This possibility should be reconsidered without delay.

At the same time other preventive measures should be pursued. These should include:

(1) improvement in the design of guards for open fires, and proper provision made for fixing them in all new houses being built by local authorities; (2) regulations requiring that all electric and gas fires offered for sale must conform to certain definite safety standards, which would include adequate guarding; and (3) nation-wide propaganda maintained for several years by radio, the press, the cinema, demonstrations, exhibitions, talks in schools and community centres, &c., and by personal contact.

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EXCISION-SUTURE TECHNIQUE: INFECTIONS OF THE HAND

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INFECTIONS of the hand are today recognised important surgical condition, and during the last there have been considerable changes in the treatment. With the formation of hand clinics better understanding of the surgical principles the results have improved considerably.

Iselin[1] describes the serious results that at one followed infections of the hand; long periods of stiff hands and fingers, infected bone and joints, even fatal results were all too common. These complications are rarely seen today, but there remains room for improvement, particularly in the taken to obtain healing and full function. A few are *still seen in which serious complications* arise—infections of bone, joint, and tendon—usually in p who came late to hospital for treatment.

Three measures have to a large extent contribute the improved results seen today: (1) immobilisatio the infected hand and abandonment of foments, soaks, dry heat, and frequent dressings, &c.; (2) therapy has probably reduced the incidence of complications; and (3) the method of excision of slough and suture after incision has led to an even period of disability.

We describe here the results obtained by using all measures described above, particularly in cases by excision and suture as described by Loudon et a[2] 100 cases treated in the first six months of 194 which the notes were adequate have been analysed.

ÆTIOLOGY

In the 100 cases analysed there was a history of in 34 and a foreign body was found at operation cases.

The age of the patients ranged from 1 to 67 62 were males and 38 females; 60% were workers, 22% worked at home or were children, and 17 were office workers.

The average length of history was 7·4 days, but cases which subsequently healed without full it was 9·5 days. If such cases could be seen earlier

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[1] Iselin, M. Surgery of the Hand. London, 1940.

[2] Loudon, J. B., Miniero, J. D., Scott, J. C. *J. Bone Jt* 1948, 30B, 409.

TABLE I—ANALYSIS OF INFECTIONS AND RESULTS

Site or type of infection	No. of cases	Duration of disability (days)	No. sutured	Final function and appearance	Complications
Paronychiæ ..	29	14·2	2	29 good	Nil
Distal pulp ..	46	15·2	35	42 good 4 fair	Bone necrosis 4* adherent sl
Middle and proximal pulp ..	15	12	9	15 good	Nil
Dorsal	5	13·6	4	5 good	Nil
Carbuncle ..	1	24	0	1 good	Nil
Tendon-sheath (flexor) ..	1	26	1	1 good	Nil
Web	3	15	3	3 good	Nil
Mid-palmar space	2	18	1	1 good 1 fair	Slight residual stiffness of

* One case developed both bone necrosis and an adherent slough.

tle doubt that the results would be further ved.

commonest digit to be infected was the left thumb, the right thumb a close second, whereas the left finger was infected least often. The type and ency of infections seen are shown in table I, together he results of treatment. Two patients had a double ion, so 102 fingers were involved.

TREATMENT AND RESULTS

nservative treatment by immobilisation and chemopy alone was attempted in 3 cases of pulp infection; case the infection was aborted, but in the other 2 cal treatment became necessary. Preoperative peni- 250,000 units was given in all cases. Pus may be ous when the case is first seen; otherwise its presence be indicated by pain and local tenderness. In cases oubt the hand was treated by conservative means there was more definite evidence.

99 cases an incision was made, and pus was obtained l. After cleaning out the pus and excising any slough nt, it was possible to suture 55 cases. All cases were ated on with a rubber band at the base of the finger, pneumatic cuff on the arm, to ensure a bloodless . It was not always possible to use a standard sion, since the pus had sometimes ruptured through skin; the incision was then made in the position of sinus. If the skin was intact, lateral incisions in the ger were used and, if necessary, turned into flaps to ure adequate excision of the slough. In the hand, nsverse or L-shaped incisions were used.

TABLE II—RESULTS OF EXCISION AND SUTURE

Site of infection	No. of cases	No. sutured	Primary healing	Unsatisfactory
nychiæ	29	2	2	Nil
al pulp	46	35	31	1 stitches cut out; 2 pus reformed; 1 pain caused stitches to be removed
dle and proximal ılp	15	9	8	1 stitches cut out
sal	5	4	4	Nil
don-sheath (flexor)..	1	1	1	Nil
.. .. ..	3	3	3	Nil
-palmar space ..	2	1	0	1 stitches cut out
Total..	102	55	49	6

EXCISION-SUTURE TECHNIQUE

A tourniquet and general or local anæsthesia were d so that at least 15 minutes could be spent on the ration. The operation was done under proper theatre ditions. The most suitable incision was made, the scess cavity was opened, the pus was mopped out, a careful search was made for any sloughs. If sent they were excised completely. This is an essential p in this method. The incision was then closed if ssible with interrupted stitches of black silk. It important not to tie these stitches too tightly, for tissues may swell and cause the stitches to cut t.

If there is skin necrosis, or if there is doubt about the nplete excision of the slough, the incision should not sutured. If the skin edges are only slightly necrosed, margins can be brought together with a few stitches ing a wider bite through the healthy skin.

The main advantages of this method are early healing th complete comfort for the patient.

No serious complications followed this method, but it led in 6 cases out of 55 (table II). These unsatisfactory results were mainly due to failure to excise the whole slough. This method involves more operating time, but there is a big saving in nursing time, since the dressings are left untouched for a week. Symptoms may necessitate earlier removal of the dressing, but this occurred on only 2 occasions in the present series.

TABLE III—COMPARISON OF SERIES WITH AND WITHOUT EXCISION AND SUTURE

Site or type of infection	1948		1947	
	No. of cases	Length of disability (days)	No. of cases	Length of disability (days)
Paronychiæ	29	14·2	28	14·5
Distal pulp	46	15·2	32	43
Middle and proximal pulp	15	12	33	25·5
Dorsal	5	13·6	2	15
Carbuncle	1	24	1	29
Tendon-sheath ..	1	26	—	—
Web	3	15	3	40
Mid-palmar	2	18	—	—
Thenar space	—	—	2	20
Total infections and average length of disability	102	14 6	101	28·1

PARONYCHIÆ

The excision-suture method is not often applicable in these cases; it was used twice, when a nail flap was turned down. All these cases were treated by removal of part of the nail or, occasionally, the whole nail.

Pulp Infection (Finger)

It is in these cases that the excision-suture method can be used most often with the greatest advantage. Necrosis of the skin was the main factor in preventing suture, and it was also considered unwise to suture if there was definite bone necrosis, as shown by preoperative radiography.

Middle and Proximal Pulp Infections (Finger)

These cases were treated on the same lines as pulp infections, but excision of sloughs was not so often necessary.

Dorsal Infection (Finger)

Out of the 5 cases seen, 4 were treated by the excision-suture method; each case healed by first intention.

Flexor Tendon-sheath Infection

These cases should be admitted to hospital. Only 1 case occurred in this series; it was treated by exposing the proximal and distal ends of the sheath by a small transverse incision through the skin and sheath. The pus was milked out, and 5 ml. of penicillin (5000 units per ml.) was instilled along the length of the sheath. Both wounds were sutured, and they healed by first intention in seven days. Full function was present in twenty-six days.

Web Infections

These were treated by the usual web incision, cleaning out the pus, and suturing the skin; they all healed by first intention.

Mid-palmar Space Infections

In 1 case skin necrosis prevented suture; in the other one the skin was sutured but gaped in part, and some delay occurred in healing.

Anæsthesia

In 27 cases a digital block was produced with 2% procaine with 2% adrenaline (1 : 1000). In small doses the addition of adrenaline is safe and enhances the anæsthesia. General anæsthesia was used in the other cases.

Postoperative Treatment

No form of external drainage was used, and the wound was dressed with sulphathiazole-penicillin powder (5000 units per g.) with tulle gras. In all cases the affected part was immobilised by a dorsal plaster slab and elevated in a sling.

Most patients were given aqueous penicillin 250,000 units b.d. for three days by intramuscular injection. A week later the wound was dressed for the first time, and, if all evidence of infection had subsided, the patient was told to use his hand or finger. If there was much limitation of movement, he was referred to the physiotherapy department for exercises. This treatment must not be started until all infection has subsided. 33 cases were referred for exercises, and only 1 case had slight residual stiffness of the fingers when the patient was last seen.

Results

Most patients were operated on by one of us (H. D. W. P.), but some were treated by the house-surgeon on duty; therefore exact uniformity of technique was not always possible. It has been impossible to analyse 100 consecutive cases, because some patients did not attend for follow-up, and in other cases the records were incomplete. We feel that the length of disability is the best criterion by which to judge the results in infections of the hand. By this we mean length of time taken for the wound to heal and full movement to be present. Healing time may be misleading, as full function is not necessarily present.

Our results are shown in table III, where they are compared with a similar series of cases treated a year earlier. In the earlier series the excision-suture technique was not used, external drainage was common, and daily dressings were applied in most cases.

It will be seen that the average length of disability has been halved since excision and suture immobilisation have been used. The improvement is most striking in pulp infections. We have followed the technique described by Loudon et al.[2] fairly closely. The incisions have been rather smaller than those advised, and we have not often used flaps. Admittedly the slough was incompletely removed in some cases, but we feel that this was due to failure to excise the slough fully and not to inadequate exposure.

The complications seen were bone necrosis and adherent sloughs; both these results could be largely avoided if the cases were seen earlier. In 1 case excision of a large slough left a depressed scar when the finger healed; 2 cases required reincision later owing to pus re-forming.

What of the future? How can these hand infections be further reduced in number and severity? Further propaganda is required in factory, office, and home about the proper care of all cuts, &c. If penicillin could be given within a few hours of the onset of the symptoms, and the affected part immobilised, many infections might be aborted.

SUMMARY AND CONCLUSIONS

The excision-suture technique is another valuable step forward in the treatment of hand infections. It reduces the disability period and ensures greater comfort for the patient; it can be used with advantage in any busy casualty department once the principles are fully understood. The method was followed in 55 out of 100 cases analysed here.

We agree that immobilisation is of prime importance.

Chemotherapy is of considerable value in preventing and controlling serious complications; its value in well-localised infection of the hand is less certain.

In our view there is no place for rubber drains, hot foments, soaks, dry heat, &c., in the treatment of hand infections.

SOME RECENT APPLICATIONS OF

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Nisin, the antibiotic produced by *Strep. lactis,* to be of practical value. It is mainly effective gram-positive organisms, including the tubercle Its value resides in its bactericidal nature, and injections are remarkably effective against streptococcal and clostridial infections in the (Mattick and Hirsch 1947). It also appears to be ef in experimental tuberculosis. Recently this was used in a field trial against bovine strepto and staphylococcal mastitis (Taylor et al. 1949). only single infusions of nisin in oil (1 ml.) were the percentage cured was very high.

Nisin has the properties of a polypeptide or of low molecular weight. It is soluble in dilute and the solution is heat stable. It tends to pr tate at neutrality and is slowly labile under all conditions.

METHODS

In the experiments described below the prep of nisin crystals were made by Berridge (1949) concentrates supplied by Benger's Ltd. Solutio N/50 HCl were used for in-vitro tests. For inje these solutions were brought to pH 4, with formation of a haze.

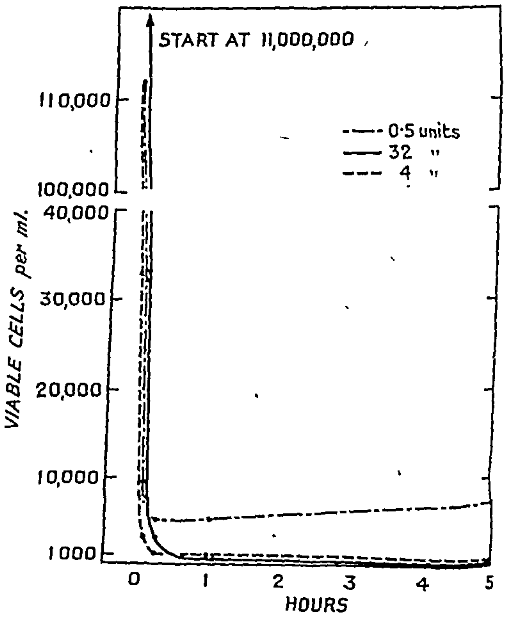

Fig. 1—Effect of nisin on viable count of *Strep. agalactiæ.*

The first blood-nisin levels were estimated modifications of Fleming's (1944) capillary assay, reproducible results were not obtained by this met The "lag-phase" assay which overcame these difficu was finally adopted (Hirsch 1949). The assays made on the serum, which appears to contain all activity.

BACTERICIDAL POWER OF NISIN

The bactericidal power of nisin was tested *in vi* small quantities of nisin being added to a heavy cul of *Strep. agalactiæ.* A typical result with count illustrated in fig. 1. An experiment to explore behaviour in vivo was made. Mice infected with *St* *pyogenes* "Richards" were given a single subcutane injection of 20,000 units after the establishment infection. Mice were sacrificed at interv the heart, and counts were made on blood-agar. urve, almost identical with fig. 1 was obtained. figure shows that nisin is rapidly bactericidal, a reduction in the count being obtained in the first inutes. Other antibiotics, such as penicillin, which appear to be bactericidal, require several hours' tact to achieve a comparable reduction in numbers.

TOXICITY

he subcutaneous LD50 of crude nisin was reported Mattick and Hirsch (1947) to be about 3·5 g. per kg. similar systematic investigation has yet been made determine the LD50 of the purified material, but an roximate idea of the toxicity was gained from imations of blood-nisin levels in about 30 rabbits.

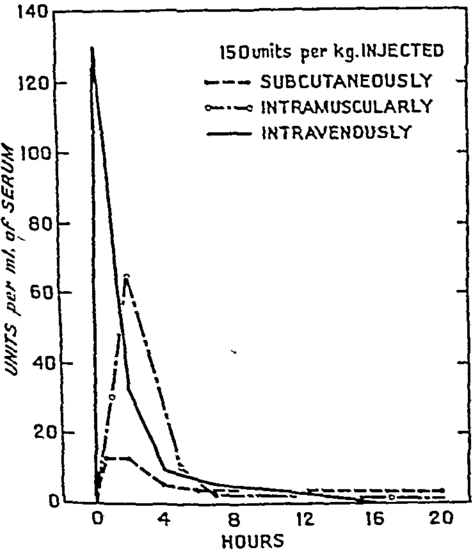

Fig. 2—Blood-concentrations of nisin after single injections.

The results show that the toxicity of "pure" nisin pends on the route of administration. Intravenously rabbits, 5,000,000 units (33 mg. per kg.) was always al whereas 3,000,000 units (20 mg. per kg.) was not, ough often the rabbit showed signs of distress and e blood did not clot normally. The LD50 intravenously thus between 20 and 33 mg. per kg. Similarly the 50 intramuscularly is about 200 mg. per kg., and bcutaneously it is greater than 1000 mg. per kg.

Rabbits which receive a fatal intravenous dose of sin die quietly and within a few minutes. Similar jection in guineapigs leads to violent spasms, the mptoms of both these conditions resembling "peptone ock" as described by Wilson and Miles (1946).

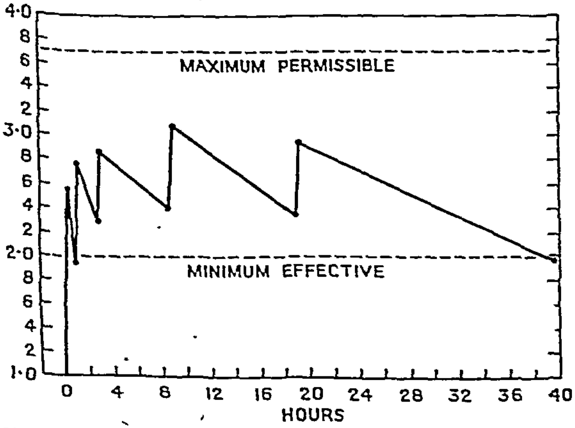

Fig. 3—Blood-concentrations of nisin after repeated injections at 0, 1, 3, 8, and 19 hours.

TABLE I—EFFECT OF NISIN ON ERYTHROCYTES

Concentration of nisin	Red cells in					
	0·85 % NaCl			5 % Glucose		
	Hours			Hours		
	1·5	5·5	22	1·5	5·5	22
20,000 u. ml. in 2·0 ml. N/20 HCl	–	–	–	–	–	–
10,000 „ „ 1·0 „ „ „	–	–	+	–	–	–
5000 „ „ 0·5 „ „ „	–	–	+	–	–	–
2000 „ „ 0·2 „ „ „	–	–	+	–	–	–
Control, 2·0 ml. N/20 HCl ..	–	–	+	–	–	–
„ 1·0 „ „ „ ..	–	–	+	–	–	–
„ 0·5 „ „ „ ..	–	–	+	–	–	–
„ 0·2 „ „ „ ..	–	–	+	–	–	–
Control; no acid	–	–	+	–	–	–

After necropsy the kidney, liver, spleen, heart, and lungs of these rabbits were suspended, according to their moist weight, in compensated volumes of *N*/20 HCl, and the tissues were put through a Folley and Watson (1948) blender and placed in a boiling water-bath for 5 minutes to extract the nisin. After centrifuging the samples were assayed. A similar procedure was carried out with the lesions at the site of repeated subcutaneous injections (see below).

All the internal organs contained some nisin, but by far the highest concentration was in the lungs. The subcutaneous lesions contained almost all the nisin which was injected, a finding which probably explains the low toxicity of nisin given by this route. In fact, owing to non-absorption the subcutaneous route is unpromising.

The "peptone shock" symptoms of fatal doses of nisin are not usually reproduced when the injection is given slowly (1 ml. per minute) with a perfuser. Slowly injected nisin kills at the same level as rapidly injected nisin, but death seems to be due to respiratory failure. No gross systemic effects have been noted.

TABLE II—EFFECT OF NISIN ON MYCOBACTERIA IN LONG'S MEDIUM

Organism tested	Inhibited by units per ml.	Viability after 14 days' contact
Myco. phlei	300	..
Myco. tuberculosis (avian) D4 ..	300–600	Alive
„ „ (human) C ..	100–600	Dead
„ „ „ DT ..	300	„
„ „ (bovine) AN5 ..	300	..
Myco. johnei III and V	1000	Alive

EFFECT OF NISIN ON BLOOD

The effect of crude nisin on leucocytes, as estimated by the technique of Abraham et al. (1941), has already been reported by Mattick and Hirsch (1947). Though there was no apparent action, this observation remains to be confirmed with the purer preparations. The effect of purified nisin on red blood-cells was tested by the technique of Rammelkamp and Weinstein (1941), and the results given in table I show nisin to be non-hæmolytic in the highest concentrations tested and which could be expected in vivo.

Berridge (1949) reports that nisin is soluble in ox blood to the extent of at least 5000 units per ml., and E. M. Bavin (private communication) puts this figure at 20,000 units for mouse blood. In any case, judging by the in-vitro sensitivity of the more resistant mycobacteria, even the lower figure is sufficient to secure effective therapy.

BLOOD LEVELS

The blood levels obtained after single injections of nisin are given in fig. 2, which shows that the behaviour is according to anticipation: low concentrations for longer times were obtained by the subcutaneous route than by the intravenous route, which gives high peaks

TABLE III—EFFECT OF NISIN IN EXPERIMENTAL TUBERCULOSIS

Exp. no.	Nisin used	Animals used	No. of animals	Infecting strain	Route of infection	Treatment, hours after infection	Route of treatment	Dosage		Duration		Toxicity		Results	
								Spacing	u./kg./day	Treatment	Experiment	At site of injection	Systemic	Controls	Treated
1	Crude	Guineapig	8	C	Subcut.	12	Subcut.	6-hrly.	720,000	4 weeks	8 weeks	Severe reaction. Œdema followed by necrosis and peeling	Nil	Heavily infected. All lower lymphatics, spleen, liver involved	Spread and of infect reduced. Li and spleen
2	Crystalline	„	8	C	„	„	„	„	1,200,000			As Exp. 1 but much less severe	„	As 1	As 1
3		„	8	C	„	„	„	„	1,200,000			As Exp. 2	„	As 1 but lungs involved as well	As 1. Lungs involv
4		Rabbit	6	AN 5	Intraven.	„	Intraven.	8-hrly.	1,700,000	5 days	12 weeks	Slight. Veins somewhat hardened	„	Generalised tuberculosis of lungs, spleen, mesentery, &c.	No lesions visibl Histologicall early tuber culosis

of short duration. The intramuscular route occupies an intermediate position.

Fig. 3 illustrates an experiment in rabbits, which was the culmination of preceding experiments designed to stabilise the blood levels between two arbitrary levels of "maximal permitted" concentration (5000 units per ml. of serum based on the solubility figure of Berridge) and "minimal effective" dose (against mycobacteria) of 100 units per ml. of serum. The results show that the excretion (or inactivation) of nisin is gradually slowed down after repeated injections, and that, after an initial "saturation," satisfactory blood-nisin levels could be obtained by 12-hourly injections.

Blood levels of 1–10 units per ml. of rabbit serum are obtained by feeding nisin in the mash.

EFFECT OF NISIN ON MYCOBACTERIA

In Vitro

The sensitivity in vitro of various strains of mycobacteria to nisin was first tested in Long's synthetic medium, and the inhibiting dilution was judged to be that concentration of nisin which prevented the development of pellicles. These results are shown in table II. It will be seen that 100–300 units of nisin were required for complete inhibition; but, when later these experiments were repeated in the medium of Dubos and Davis (1946) containing 'Tween 80', only 1–3 units were required for inhibition, an effect noted with other antibiotics (Dubos 1948). In this medium nisin appears to have about the same activity, weight for weight, against the mycobacteria as streptomycin (Smith and Waksman 1947, Crofton and Mitchison 1948).

Working with *Myco. phlei* and strain H37RV of *Myco. tuberculosis* in the medium of Dubos and Davis, we tested combinations of nisin with other drugs fairly extensively for synergic and other actions. It is almost impossible to construct a single table to show the various levels at which each of the antibiotics is effective, since large variations were encountered from experiment to experiment. Each experiment, however, contained adequate controls—i.e., the antibiotics considered were always assayed alone as well as in combinations in every experiment—and thus it is possible to conclude that there was no synergism, or even marked additive action, between nisin and streptomycin or between nisin and licheniformin. Combinations of three antibiotics—e.g., nisin, streptomycin, and licheniformin—led, however, to increased activity, which could not be ascribed to a combination of any of the two. A similar behaviour is shown by nisin, licheniformin, and sulphathiazole, though more than a mere additive action appears exist with combinations of nisin and sulphathiaz If, by serial subculture in increasing concentrations each of the three antibiotics used, resistant cultures each one were prepared, these were still suscepti to the action of the other two antibiotics. Sulp thiazole-resistant cultures were also still sensitive nisin.

It can therefore be seen that streptomycin- cultures are sensitive to nisin, and vice versa– important finding, since there seems to be little do that there is some correlation between the strepto resistance of the infecting strain of the tubercle baci and the prognosis of the illness (Medical Research C 1948).

In Vivo

The effect of nisin in vivo on the tubercle was tested in four experiments, details of which given in table III. So far only prophylactic experime have been made, and much still remains to be learn The data given in table III illustrate this point. In first experiment crude nisin was used, and this reduc the spread of infection. It was hoped that purifi nisin, which was used in a similar way in the second a third experiments, would be of more value. Despite t very much purer nisin which was used, the outcome these two experiments was similar to that of the firs The results can largely be attributed to the fact th nisin forms insoluble subcutaneous pockets from wh there is but little absorption. This explains the loc reaction, as shown in table III.

Experiment no. 4 was undertaken when it was realis that nisin was bactericidal and that a high blood-ni level could be obtained by the intravenous route. Th was some hardening of the veins at the site of injecti but otherwise no reaction to nisin was observed. T result of this experiment, though made on very f animals, is rather striking. Thus, at the time necropsy, the controls had generalised tuberculos but macroscopically infection could not be detected the treated group. Histological examination, howev revealed early tuberculosis.

SUMMARY

Nisin is bactericidal in vitro and in vivo. It see to have no effect on blood, but its toxicity depends the route of injection. Severe local reaction on repeat subcutaneous injections is obtained. Intravenously a intramuscularly there is rapid absorption with little ocal reaction, and the approximate LD50 is 30 mg. kg. with intravenous injection and 200 mg. per kg. ι intramuscular injection.

he H37RV strains of *Myco. tuberculosis* which are :tant to nisin are susceptible to streptomycin and versa. More than additive effect against H37RV btained where nisin is used with streptomycin and eniformin, or with licheniformin and sulphathiazole. iven subcutaneously nisin limited the spread of erimental tuberculosis. Given intravenously it almost pletely suppressed its development.

'e wish to thank Mr. N. J. Berridge, PH.D., and Messrs. ger's Ltd. for gifts of nisin used in this work.

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NTRAMEDULLARY ABSCESS OF THE SPINAL CORD

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)F the suppurative conditions related to the spinal d, extradural abscess is the commonest; it may ow trauma or local disease of bone, or may arise as netastatic infection from some distant source, often oil. Its early recognition is important because ener- ic treatment, by means of antibiotics and laminec- ny, may be successful if undertaken before the aplegia becomes complete.

An abscess formed within the dura but outside the d itself is rare. It is usually the result of localisation a purulent meningitis, or of trauma.

ntramedullary abscess of the spinal cord is extremely e. In the past it has proved almost uniformly fatal, t by modern methods the suppurative process may localised and the abscess successfully drained.

PREVIOUS REPORTS

Arzt (1944) reviewed 37 cases of intramedullary cess reported since 1830, and added 3 fatal cases ociated with infective endocarditis. Since then Ameli 48) has reported 1 case with recovery, and Vlasova 45) mentions 4 fatal cases following spinal wounds.

The ages of the patients (Arzt, Ameli) ranged from ht days to seventy-five years; 25 were males, 15 re females, and in 1 the sex was not mentioned. Of 9 cases below the age of fifteen, 7 were girls, but after lescence males predominated.

No level of the cord is exempt, though there appears to a predilection for the lower dorsal and lumbar seg- nts. In 12 of 42 cases the abscess extended over more n five segments: in one it had extended from the dulla to the lumbar region before death occurred. In laminectomy was performed: 6 of these patients d, 1 was left with an unimproved paraplegia, and mproved enough to walk. Of the 18 cases occurring fore 1900 all were fatal except 1, in which a paraplegia remained despite exploratory operation. Laminectomy with recovery has been reported by Woltman and Adson (1926), Walker and Dyke (1936), Alessi and Fasiani (1940) and Ameli (1948).

Origin

The cause was most often a blood-borne infection from a distant septic focus (26 of 42 cases); less commonly the infection spread into the cord from suppuration in neighbouring tissues (9 cases), and in 7 cases no source could be found. Where infection was deemed to be blood-borne, chronic suppurative pulmonary disease was the commonest cause, with infective endocarditis coming second (and usually causing multiple miliary abscesses); less frequently pelvic disease (including septic abortion, urethritis, vaginitis, and prostatic abscess) was responsible; 3 cases were due to actinomycosis, 2 to otitis media, and 2 to cutaneous infections. Of the local vertebral and paravertebral conditions from which infection spread into the cord, (closed) fracture came first, followed by tuberculous and pyogenic osteomyelitis, and infection in such conditions as meningocele and spina bifida with a communicating sinus. In 10 cases the abscesses were multiple.

Infection may be conveyed to the cord by the spinal arteries, though these are small and arise from their parent trunks at an acute angle; more probably it travels by the vertebral and spinal veins, which communicate with the pelvic veins and the veins of the abdominal and thoracic parietes. Possibly also it may travel in a retrograde manner along the lymphatics of the spinal nerves, thence invading the perivascular spaces; the early appearance of root pains in an intramedullary lesion is a point in favour of this route.

The reasons advanced for the rarity of spinal abscesses are (1) the small volume of the cord in comparison with that of the brain; (2) the small lumen and acute angle of origin of the spinal arteries; and (3) the protected situation of the cord. Some cases running a chronic course may have been diagnosed as transverse myelitis or meningomyelitis and may have ended in a paraplegia not causing death in hospital.

The causative organism was isolated from the abscess in 21 instances. In 9 it was a staphylococcus, in 4 a streptococcus, and in 1 case both were found. Pneumococci and coliform organisms occurred together in 3 cases, actinomyces in 2, and pneumococcus and actinomyces in 1, and in 1 case there was a mixed infection with staphylococci, streptococci, pneumococci, and actinomyces; 1 abscess was sterile (after a course of penicillin and sulphathiazole).

CLINICAL FEATURES

The course may be rapid, with death within a week, and this seems to be usual where septic infarction of the cord follows such conditions as infective endocarditis, bronchopneumonia, or empyema; thus in 2 cases where intramedullary abscess complicated suppurative pulmonary disease, death occurred in three days. It is important, however, to appreciate that in most cases the course is subacute or chronic and that symptoms are evident for weeks or even months before death or (for the fortunate few) operation. Thus in 1 case, in which the primary disease was intrathoracic and in which a cerebral abscess coexisted, the patient survived seven months; while another patient had symptoms for more than two years before coming to operation.

In acute cases backache and root pains are said to be rather less conspicuous than in extradural abscess, and the first symptom is usually paræsthesia in the feet, followed by increasing weakness and a rising level of sensory impairment until the signs of a complete transverse lesion of the cord are present; even then there may still be a further ascent in the sensory level (Elsberg 1941). Paralysis of the sphincters comes early; and in about half the acute cases, after a few days of flaccid paraplegia, signs of meningitis develop. In subacute cases symptoms may be purely motor after the initial root pains, and it is not until the paralysis is almost complete that sensory loss is manifest. In 3 of the reported cases visual impairment due to optic neuritis was the first symptom, preceding the spinal symptoms by as much as a week. In the chronic form of the disease, root pains are nearly always present at the start; the course and the clinical and radiological findings are those of intramedullary spinal tumour; terminal meningitis is not a feature, death occurring as a result of urinary infection, bedsores, or the primary infective condition.

The diagnosis has very rarely been made before the cord was examined; so wherever an intramedullary tumour is encountered at operation the cord should be aspirated and if necessary incised through the posterior median septum.

Examples of Recovery

Evidently the spinal cord has a far greater ability to recover from a space-occupying lesion within its substance than is generally supposed. Notable examples of subacute or chronic abscesses are those of Hitchcock (1917), Woltman and Adson, Walker and Dyke, and Ameli.

In Hitchcock's case a man had noticed numbness and some weakness of the left leg twelve days before admission, becoming worse and being followed by abdominal pain on movement or sitting; three days before admission he had difficulty with micturition. He was found to have septic lesions of the hands and almost complete spastic paraplegia with hypalgesia on the left leg and left side of the abdomen. Numbness soon developed in the right leg, and the paraplegia became flaccid with a sensory level to pin-prick at D 12, though light touch sensibility remained unimpaired. Laminectomy was carried out, but unhappily the cord itself was not punctured, and he died with a large abscess occupying the lower 7 in. of the cord.

Woltman and Adson's patient was a girl of eleven whose legs suddenly became paralysed; she had retention of urine and low pyrexia, and soon developed a bedsore. After three months she made an almost complete spontaneous recovery. Two years after the first episode spastic paraplegia slowly developed in the course of five months, at the end of which time sensory loss with an indefinite level at D 8 was apparent. There was evidence of spinal subarachnoid block; the fluid contained but 2 lymphocytes per c.mm. At operation the dura was found to be bulging and thickened, and from an abscess cavity in the cord, 1·5 cm. long at D 7, pus containing staphylococci of low virulence was obtained. Sensibility began to return to the legs in two weeks; after eight months she could just walk, and sphincter control was normal; and in two years she made a complete recovery.

Walker and Dyke give the history of a girl of three who for a year had had intermittent attacks of headache and vomiting, and, during the month before admission, backache and transient paresis when her pram was jolted. A week before admission she had a severe headache, complained of generalised pains, and lost the use of her legs. She was admitted with pyrexia, signs of meningitis, and a spastic paraplegia, with pain on passive movement but no sensory impairment; there was a small dimple with a single hair in the lower lumbar region, and radiography showed the laminæ of L 4 and 5 to be defective. A lumbar puncture gave, on altering the depth of the needle, two different fluids, one frankly purulent, the other turbid but less proteinous; pneumococci and coliform organisms were grown from both, and staphylococci were grown from the cisternal cerebrospinal fluid (c.s.f.). At the first operation a thick fibrous stalk was traced from the dimple to the dura, and turbid c.s.f. flowed from the incised theca. The temperature fell, but the spasticity increased. Some three weeks later needling revealed thick pus, and at the second operation the lumbar enlargement of the cord was found to be swollen and congested; on incision 12 ml. of pus issued from a cavity 1 cm. wide. After two months she was just able to walk with assistance, and seventeen months later she was apparently normal.

Ameli's patient was a girl of six who eleven months admission had suffered from vulvovaginitis and after eight months the pain grew worse and she devel foot-drop on the left, with absence of the left knee-jerk ankle-jerk but no sensory impairment. Five weeks admission a flaccid paralysis of the right leg developed, she was given penicillin. Paraplegia had become in a further two weeks, with retention of urine; it was a week after this that sensory loss could be detected. puncture supplied evidence of complete spinal block, myelography demonstrated the level of the lesion at the border of the eleventh dorsal vertebra. At operation the was found to be swollen, and 3·5 ml. of pus was and replaced by penicillin solution. Only slight ensued, and the wound was reopened eleven days later, 4 ml. of pus was aspirated. Seventeen days later control micturition was established; after two months she walk; and five months later she was walking with slight difficulty.

THE PRESENT CASE

A married woman, aged 42, was admitted t Atkinson Morley Hospital under Mr. Wylie McKi on Jan. 30, 1948.

History.—Three and a half months previously, while s she suddenly had a severe, burning, tight feeling i lower lumbar region, radiating round the lower abd on both sides; she had a shivering attack, and vomited. constricting sensation diminished, but next evening sh a sharp pain, worse on inspiration, in the left side of the c with shortness of breath but no cough; her temperatur 104°F. Her doctor found signs of consolidation and presc sulphonamides. Cough remained strikingly absent, exce one occasion a week later when she produced a small an of sputum streaked with blood. She spent five weeks in and was free of pain; but she continued to lose weight her periods ceased.

A month before admission she began to get burning p the region of the right iliac crest, right groin, and lef with a feeling of tightness in the lower abdomen; this was worse on lying down, and was very severe if she cou but it was eased by sitting up with a pillow behin lumbar spine. A week later she noticed steadily difficulty in raising the left leg to climb stairs, and symptom was followed by pains shooting down the borders of both thighs. A week before admission the leg became weak, and next day, while getting off a c she developed a very severe pain in the left buttock, a deep boring pain in the rectum. There was considerable in initiating micturition, and at this stage apparently and urethral sensation were lost.

Four days before admission the buttocks were numb, legs were becoming rapidly weaker, and wasting was appa The root pains persisted, and she had retention of urine overflow; she was incontinent of fæces once, and the became constipated.

Investigation.—She was a thin pale woman with a temp ture of 100°F, but no abnormality in the cardiovascula respiratory systems. Cranial nerves and upper limbs nor Abdominal reflexes present; no umbilical displacem bladder distended to umbilicus with dribbling incontine The lower limbs were hypotonic; there was moderate was of the quadriceps and buttocks on both sides, and ma wasting of the anterior tibial muscles. She had bilateral drop, and could only just lift each leg a few inches off bed. The left knee-jerk was diminished, both ankle-j were much diminished, and the plantar responses were flo There was impairment of sensibility to light touch, an painful and thermal stimuli, over the buttocks and perine down the backs of the thighs and legs, and on the soles of feet, while joint sense appeared to be unimpaired.

At lumbar puncture the c.s.f. issued at low pressure coagulated almost immediately, and contained 1200 protein per 100 ml. with 100 red cells and 5 white cells c.mm. Radiography showed no abnormality in the chest widening of the interpedicular space of the twelfth dor and slight widening of the interpedicular space of the lumbar, vertebræ. On Jan. 31 myelography was performed the cisternal route using 3 ml. of 'Ethiodan.' The cont material was held up completely at the lower border of D in the lateral view the lesion could be seen to extend up as the middle of the body of D 12. In 48 hours no contrast :erial had passed downwards. The cisternal C.S.F. contained ·hite cells (90% polymorphs), 15 mg. of protein per 100 ml., normal quantities of sugar and chloride.

'peration.—On Feb. 2 a laminectomy was performed by Valentine Logue. The dura was found to be tense, with iost no extradural fat; the subarachnoid space was iterated. The last $1^1/_2$ in. of the cord and conus were ›llen and had a yellowish mottling, while from the conus ›inkish-grey "tumour," 2 in. long, extended downwards l slightly to the right, to end in a yellow bulbous extremity. piration of the swollen conus and of the bulbous lower end [illegible] lent material, from which *Staphylo-* [illegible] coagulase-positive) grew on culture. e nerve-roots were slightly adherent to the swelling but ıld be dissected off. A portion of the mass was taken for ;tological examination. The dura could not be closed, and › exposed surface of the cord was covered with an almost ntinuous sheet of fibrin foam before closure of the wound in ıltiple layers.

Section of the minute fragment of tissue removed showed it consist of dense fibrous tissue infiltrated with small round lls.

Postoperative Progress.—Tidal drainage was instituted. In ı days the patient received 2,740,000 units of penicillin ıtramuscular) and 'Sulphamezathine' 34 g. The urine was avily infected with *Bacterium coli*. The temperature conıued at 101°F until the third day, and ranged between and 100°F for fifty-five days. Severe pains in the thighs ntinued for sixteen days. Tidal drainage was discontinued ter thirty-four days, though control of the bladder was not tisfactory until eleven weeks after the operation. Four onths after operation she could just walk, though she owed considerable weakness in all muscle groups, and lateral foot-drop. She was then sent home.

Seen nine months after the operation she said there had been eady improvement in the power of her legs, and she was ›le to dispense with her toe-springs; she could get up and ›wn stairs with the aid of a stick, and was able to do her own ›oking; only when sitting for a long time did she notice ımbness of the buttocks. She still suffered from occasional ıooting pains in the left buttock and the front of the left ıigh, together with pins-and-needles in the outer side of the mb. She looked remarkably well.

The feet were cyanosed and cold, and there was wasting f the anterior tibial and peroneal muscles, and the intrinsic ıuscles of the feet, more on the right than the left; both mbs were hypotonic. The wasted muscles were weak. The ft knee-jerk was present, the right diminished; both ankle›rks were absent, and no response was obtained on plantar ;imulation. There was a small area of hypalgesia on both uttocks, including the perineum, and there was hypalgesia nd hypæsthesia over the lower and outer part of both legs, ıe soles, and the dorsum of the feet (except for a small medial ;rip). Sense of position and passive movement was slightly npaired in the feet. Control of the sphincters was ;tisfactory, but urinary infection was still present.

SUMMARY

A case of metastatic intramedullary abscess affecting he lumbosacral enlargement of the spinal cord is escribed. Operation considerably reduced the patient's 'araplegia.

Four other reported cases with survival are sumıarised.

Early recognition of this condition is desirable now that he chances of success at operation have improved.

I am indebted to Mr. Wylie McKissock and to Mr. Valentine ogue for permission to publish this case, and to Dr. J. W. D. ull for the radiological reports.

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FULMINATING APYREXIAL POSTPARTUM STREPTOCOCCAL PERITONITIS

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COMPARED to the commoner forms of puerperal sepsis, such as pelvic infection and septicæmia, postpartum general peritonitis has been reported remarkably seldom. The condition is of course mentioned in general surveys such as those of Wyatt (1932) and Ramsay and Dolphin (1946). Wyatt, from the London County Council's puerperal sepsis unit at the North-Western Hospital, reported 12 cases of general peritonitis (8 of them fatal) among 242 patients with puerperal sepsis admitted: in 11 a hæmolytic streptococcus was grown in pure culture, while in the other case, which recovered, the causative organism was a pneumococcus. Ramsay and Dolphin quote 24 cases of general peritonitis (with 15 deaths) in the same unit in the seven years 1937–44. They regard it as still the most fatal of all puerperal complications, though the sulphonamides and penicillin have improved the chances of recovery.

We have found only five papers describing cases in detail. Banerji (1938) reports 4, of which 2 were fatal. Contamin (1938) and Keller (1935) each report 2, which recovered, and Ginglinger (1938) 1 which did not. Courtois and Phillipe (1938) who report the largest series (16) point out that fever may be slight in proportion to the pulse-rate. All writers emphasise the importance of early diagnosis, laparotomy, and drainage.

In the case we record here the diagnosis was not made before death, the difficulty of diagnosis being enhanced by the absence of fever and rigors throughout the illness. We have found no previous mention of an apyrexial course.

CLINICAL HISTORY

A.B., aged 27 when she died, had married a farmer in 1945. Her first pregnancy, which was uneventful, ended at term with a normal labour in 1946. An episiotomy was performed which was repaired with three sutures, but there was no other obstetric interference. Because of invaginated and sore nipples, breast-feeding had to be abandoned after five weeks, and despite active treatment, including sulphonamides, a breast abscess developed and had to be drained. Recovery was uneventful. The patient stated that she had always been strong and had had no serious illnesses, but that her resistance to minor infections was poor.

Finding herself pregnant again she consulted the doctor in August, 1947. During this second pregnancy she did not feel so generally fit as during her first, but her blood-pressure remained within normal limits and her urine was normal. In February, 1948, twins were diagnosed, and their presence was confirmed by radiography. Both fœtuses were vertex presentations. Labour started spontaneously at term on March 11, and the patient was conveyed by car from her own home to a nursing-home, a distance of 12 miles. A few days previously she had had a slight cold and sore throat. One of us (M. H. J.) was called to the nursing-home soon after 11 P.M. and remained with the patient till labour was complete, about $1^1/_2$ hours later. Except that she received gas-and-air analgesia intermittently and that both bags of membranes were unusually tough and had to be ruptured as they presented at the introitus, labour was perfectly normal and unassisted. Between the births of the two healthy infants, both females, the first weighing 7 lb. and the second 6 lb. 7 oz., there was an interval of perhaps five minutes, or a little more. During the second stage the patient had only two pains. A superficial skin tear in the region of the old episiotomy scar required two stitches. The third stage, except that a little fundal pressure was necessary, was quite normal and blood-loss was very moderate. A routine intramuscular injection of ergometrine was given on completion of the third stage.

One of us (M. H. J.) saw her on the evening of the next day (March 12) about 18 hours after delivery, and was told that she had been complaining of "after pains" most of the day. She had attempted to suckle the infants, but her nipples were already becoming sore. Her temperature was 98·4°F; pulse-rate 80; respirations 20. A dose of calcium aspirin was ordered. Next morning her temperature was 97·6°F; pulse-rate 72; respirations 20. She said that her nipples were sore, and in view of the previous history breast-feeding was abandoned. More aspirin, and also stilbœstrol, were ordered. She still complained of lower abdominal discomfort and intermittent cramping pain; she resented palpation but there was no rigidity. The same evening the temperature was still normal (98·4°F), and the respiration-rate was 22; but her pulse-rate had risen to 120. For the first time she looked ill, being pale and slightly cyanosed. There had also been difficulty in passing urine; 8 oz. was withdrawn by catheter. Her bowels were not opened. There was no vomiting. The lochia were clean and inoffensive, the stitch area clean, and the breasts comfortable. The abdomen was slightly distended and tympanitic. There was no rigidity although there was generalised abdominal tenderness.

The clinical picture was more suggestive of mild shock than of infection. Nevertheless, in view of the abdominal tenderness and increased pulse-rate, sulphadiazine was ordered and also 'Omnopon' and scopolamine for the relief of pain.

Next morning (March 14) she was clearly very much worse. Catheterisation yielded 6 oz. urine. She was pale, restless, and cyanosed. The abdomen was distended, with a central area of tympanites and shifting dullness in the flanks. There was slight generalised abdominal rigidity. Temperature 98·6°F; respirations 40; pulse uncountable. Another opinion was sought, but before it could be obtained the patient had an immense vomit and died within a few minutes. At no time during the whole course of the illness did she show any pyrexia. The condition suggested some such abdominal catastrophe as massive mesenteric thrombosis, volvulus, or postpartum rupture of the uterus.

POST-MORTEM FINDINGS

At necropsy the same day more than 2 pints of turbid and quite inoffensive fluid, not bloodstained, was found in the peritoneal cavity; it was thin in the upper abdomen but thicker in the pelvis. The stomach and first part of the small intestine were greatly distended. The last 6 ft. of small intestine was shrunken and empty and the surface was brightly injected. The peritoneum had not lost its gloss and was not flecked with fibrin or pus. The appendix appeared normal. The large intestine contained firm fæces and was not particularly collapsed. There was neither volvulus nor herniation of the intestine. No antemortem thrombus was found in the pelvic or mesenteric vessels. There was passive congestion of both pulmonary bases but no other abnormality in the thorax. No pulmonary thrombosis was found. The liver, kidneys, pancreas, and spleen appeared normal. The fimbriæ and ampullæ were deeply congested. Dr. C. P. Warren, pathologist to the Royal Devon and Exeter Hospital, reported as follows. "*Peritoneal fluid.* (*a*) Centrifuged deposit. Gram film: many pus cells. Many short-chain streptococci. (*b*) Cultures: hæmolytic streptococci of group A (Lancefield). *Uterus and appendages.* A bulky postpartum uterus (9×5×4 in.) with a dilated os and injected ovaries and fallopian tubes. The fundus contains small blood-clots and the endometrium is soft, shaggy, and oozing. There is no evidence of retained placental fragments. There are a few small portions of membrane."

POSSIBLE SOURCE OF INFECTION

In the evening of the day on which the patient died the maternity nurse who attended her developed a sore throat. On the following day one of us (M. H. J.) who made the post-mortem examination also developed a mild sore throat. On the day after the patient's death swabs were taken from the throats of the husband, doctor, and nursing staff, and were examined and cultured by Dr. B. Moore at the Public Health Laboratory, Exeter. The throats of the doctor (M. H. J.) and of the maternity nurse in attendance, but of none of the rest of the staff, were found to be infected with a streptococcus of group A, apparently identical with the organism found in the patient's peritoneal fluid. The group-A streptococcal strains isolated from the throats of the doctor and of the maternity nurse, and from the patient's peritoneal fluid, were examined by the Streptococcal Reference Laboratory, Oxford, and were reported as being probably of the same type, in that they agglutinated with G types 5, 17, 22, and 25 sera.

The twin infants were put under the charge of ano nurse, who conveyed them to her own home. A days after she had done so she developed a mild strep coccal tonsillitis, and her sister, who had been away another part of the county *and who joined her at* a few days later, also developed a severe strept tonsillitis, soon after reaching home, which kept away from work for about six weeks. The hæmoly streptococcus isolated from these throats was not typ for the doctor who took the swabs was not aware at time that the nurses had any association with the reported in this paper.

It is impossible to decide in retrospect the source of infection with any degree of finality. In t great majority of puerperal infections the infecti organism is held to be derived from the medical nursing attendant or from a member of the household. Dr. Dora Colebrook found, however, that 12% of cases the organism came from the patient's throat (Colebrook 1935). The clinical sequence above suggests that the patient's throat may have the source of infection here; for she had a sore t before admission to the nursing-home whereas symptoms developed in the attendants after the ev

It is with a proper sense of humility that we r this case, in the hope that our experience may put o on their guard.

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ANKYLOSING SPONDYLITIS

IN ALL THREE CHILDREN OF ONE FAM

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ANKYLOSING spondylitis is a disease of unk ætiology. Its familial incidence has not been exte studied, but there is growing evidence that fa factors play a part in its development. Thus Ca (1947) says "the familial history is *significant* is *inadequately emphasised in the English litera* Commenting on a paper by Polley and Slocumb (Freyberg points out "that a large percentage spondylitis tell of their brothers, fathers or sons who true spondylitis. Often it is not recognised." he says "we found families in which the female se affected also—father and daughter, or a son an mother would have spondylitis." Polley and Slo themselves noted a definite family history in 0·4% of 1035 cases, while Simpson and Steve (1949) figure is 1·0% of 1200 cases.

There have been several reports on ankyl spondylitis in brothers. Ray (1932) described male who were both affected. Dawson (1935) q Burckhardt's report of a family in which the mothe four sons all had ankylosing spondylitis. Steche Hauser (1946) described the disease in two bro and mentioned a similar case recorded by Weil Allolio. Stauffer and Moffett (1946), writing o "pedigree of ankylosing spondylitis," reported ase in a grandfather, father, and son. (Buckley 15) says that “over 90 per cent.” of patients suffering n this condition are males.)

Ve have not found any previous report of ankylosing ndylitis in all three members of one generation.

CASE-RECORDS

ase 1.—A man, aged 25, a draughtsman, was referred ospital because of low back pain present practically for years. The pain persisted at rest, often radiated m one or both thighs as far as the knees, and was gravated by coughing and sneezing; at night some relief s obtained only by getting up and exercising the back. s general health was good and he had not lost much weight. He was a well-covered young man standing with a slight racic slump and a loss of the normal lumbar lordosis. most no lumbar movement; chest expansion 1 in. at histernal level; slight limitation of neck and hips; other nts normal. Erythrocyte-sedimentation rate (Wintrobe) mm. in one hour. Radiography: sacroiliac joints fused; cification in lateral longitudinal ligaments in upper lumbar d dorsal regions.

The patient said he had one sister and one brother. e former was “rigid from top to bottom”; the tter suffered from recurrent backache. No such mplaint was known in other relations.

Case 2.—The sister, aged 31, was asked to come up for amination. She said she had bad low back pain and atica at the age of 15, but nevertheless embarked a year later a nursing career. At 19 she had an acute flare-up of ckache with pains in all joints; the latter cleared gradually ter some weeks in bed, but she was left with a very stiff ck. Backache persisted, chiefly in the dorsal region, but e later resumed nursing at a smaller hospital where the ties were supposedly less arduous. By the age of 25 e symptoms reached the neck and shoulders; she found e could not do heavy lifting and finally gave up nursing. nce then the pain has gradually decreased, and now she ly gets an ache in the dorsal region associated with overwork d muscular fatigue.

She stands erect in a fair position, but the whole spine is mpletely rigid; the left shoulder is slightly limited in range movement but painless. All other joints are normal d chest expansion is ½ in. at the xiphisternal level. Radioaphy: bony ankylosis of the sacroiliac joints; fusion of all mbar vertebræ; thoracic vertebræ also affected.

Case 3.—The brother was also asked to come up for amination. He is 32, and says that five years ago he arted to get attacks of “lumbago” every two or three onths; the pain lasted only a few hours and he was able “work it off,” being symptom-free in the intervals. This ate of affairs continued for about a year, after which he d a year with no symptoms. Three years ago the attacks of mbago returned, but lasted weeks or months at a time with riable free intervals. The pain was aggravated by coughing d sneezing and by gardening; it was eased by rest but not y heat or liniments. Recently the severity of the attacks as greatly diminished and at the moment has been free from in for about two months. He is well and active, has a erical job, and plays badminton. On examination, he is and muscular; the spine and all joints move painlessly rough a full range, the only abnormality discovered being me tenderness to pressure over the left sacroiliac area. adiography shows an unequivocal bilateral sacro-iliitis pical of ankylosing spondylitis. E.S.R. (Wintrobe) 20 mm. one hour.

DISCUSSION

Davison et al. (1947) reported an increased urinary cretion of 17-ketosteroids in ankylosing spondylitis. ater (1949) they stated that, though deep X-ray erapy may prove clinically effective, clinical improveent is not associated with decrease in ketosteroid cretion. Hench et al. (1949) have described the use 17-hydroxy-11-dehydrocorticosterone (compound E) rheumatoid arthritis; of their 14 patients 1 had rheumatoid spondylitis,” the American synonym for kylosing spondylitis. All his patients had low ketoeroid excretions, and the excretion level was further reduced by the use of the new compound which proved so successful in the treatment of rheumatoid arthritis. The relation of ankylosing spondylitis and rheumatoid arthritis, and their connexion with compound E, need further investigation in the light of this new work.

The apparent relation of ankylosing spondylitis to 17-ketosteroid metabolism may have a bearing on its familial incidence. In gout we have a metabolic disease with a strong family tendency in which the males are prone to develop gouty arthritis when some trigger mechanism is brought into play. Perhaps similarly there is in certain families a spondylitic tendency when certain factors operate: the males are likely to develop ankylosing spondylitis and the females may also do so if the factors are sufficiently powerful.

It is worth noting that in our original patient's brother the ankylosing spondylitis would have gone unrecognised if he had not been summoned for examination.

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MERCAPTAN IN THE BREATH OF PATIENTS WITH SEVERE LIVER DISEASE

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In four cases of severe fatal liver disease seen in the last few years, all terminating in cholæmia, the breath had an extraordinarily penetrating odour, which was quite distinctive and in three of the cases could be detected on approaching the ward in which the patient was being nursed. This smell could best be described as like that of a mixture of rotten eggs and garlic, and was closely similar to that of mercaptan. I have not been able to find any published reference to the production

ANALYSIS OF CASES

—	Case 1	Case 2	Case 3	Case 4
Sex and age (yr.)	F.30	M.22	M.10	M.31
Duration of illness (days)	49	34	26	8
Day of illness when odour was first noted	21st	25th	18th	7th
Day of illness when methionine was first given ..	36th	22nd	..	8th
Bleeding	−	+	++	−
Icteric index ..	91	83	91	142
Prothrombin ..	..	low	low	..
Urine:				
Albumin	+	+	+	+
Casts	+ (Tyrosine)	−	+	−
Red cells ..	−	−	++	−
Bile	+	+	+	+
Urobilinogen ..	−	±	−	−
Clinical diagnosis	Infective hepatitis; cholæmia	Infective hepatitis; cholæmia	Toxic hepatitis; cholæmia	Infective hepatitis; cholæmia
Necropsy findings:				
Liver	Ac. yellow atrophy	..	Severe zonal necrosis	Ac. yellow atrophy
Kidney ..	Advanced cloudy swelling and necrosis	..	Advanced cloudy swelling	Advanced cloudy swelling and necrosis

of mercaptan in the breath of patients with fatal hepatic necrosis, and the present cases are recorded in the hope of gaining further information. The salient features of the four cases are summarised in the accompanying table.

Reference is occasionally made to fœtor hepaticus or amin breath, and Lichtman[1] has briefly reviewed this. He described it as a feature of severe liver damage, and mentioned reports in which it was stated that the fœtor hepaticus was present in 20% of a series of cases of catarrhal jaundice or cirrhosis with jaundice, and in 9 out of 16 cases of liver atrophy. This odour is said to resemble that of indole and has been given the name "amin," but no suggestion is made in any of these reports that a sulphur compound might be responsible. Further, the high incidence of this fœtor hepaticus contrasts with the rarity of this present observation and suggests that they are different phenomena. The odour in the cases described here was sufficiently distinctive to exclude any possibility of its having passed unnoted in any other of the many cases of liver disease encountered. Many of these latter do in fact have fœtor, but of quite a different character, resembling the odour often found in uræmia and other toxæmic states. The chemical identity of the responsible substance has not yet been established.

The most likely origin of a mercaptan or similar compound would be the sulphur-containing amino-acids methionine and cystine. It was thought at one time that methionine therapy might have been the cause, but the table shows that this was not so. Normally the sulphur from these amino-acids is excreted in the urine as sulphates or as "neutral" sulphur, which latter is known to contain traces of a mercaptan (di-ethyl thio-alcohol) and an alkyl sulphide (di-ethyl thio-ether). These, or related substances, would give rise to the odour which is being described, if produced in greater than normal quantities. It could be postulated that in severe liver failure, under certain conditions, there might be excessive or abnormal katabolism of sulphur-containing amino-acids of tissues or food leading to excessive production of these thio-compounds.

INHERITANCE OF NODULAR GOITRE

REPORT OF A FAMILY

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It is evident that hereditary factors in simple goitre can be easily studied only in non-endemic areas, since in endemic areas many members of the same family may develop goitre for environmental reasons. Brain (1926) considered that there was also a definite hereditary
factor because some families in goitrous areas
disproportionately affected, some members c
families who were born and bred in non-endem
were affected, and hereditary goitre sometimes
in families in non-goitrous areas. Joll (1932)
that marriage between two goitrous people in an
area produced a higher proportion of goitrous
than when only one parent was affected. Gardi
(1934) reported a family from an endemic
which all the females who moved to non
areas at marriage developed goitres later, a
of their children were also affected. Crotti
and Milligan (1926) reported similar families.
(1945), on the other hand, found no evid
inherited traits on detailed examination of the
trees of 50 cases of nodular (toxic and no
goitre.

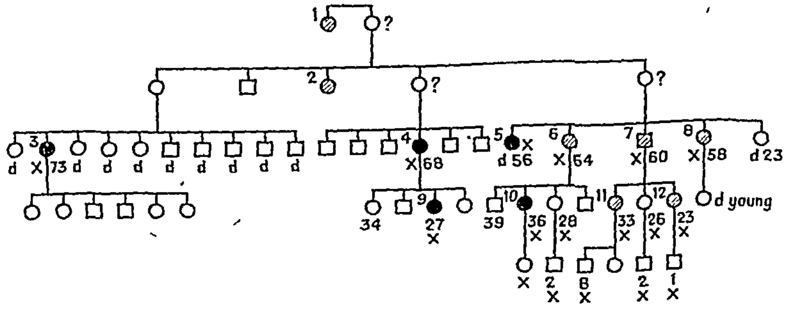
In view of the doubt of the importance of h
factors in simple goitre, and of the type of inh
involved, the present family tree (see figure) seem
reporting. The tendency of goitre in this fa
become toxic is also of interest. So far as
ascertained, no members of it had been born in
in an endemic goitre area, and all resided in
districts. The first generation was born and
Leicester, and the woman who initiated the
under discussion moved to West Birmingham a
period during her childbearing age, with the resu
some of the second generation were born in L
and later ones in Birmingham—*it is not known*
when the removal took place. All of the thi
fourth generations were born and reared in
except the final living member (no. 12), whose
had moved to Worcester. None of the spouses
married members of the family were affected a
are not included in the chart. All goitrous
had had their enlarged thyroids as long as the
remember, except that no. 9 first noticed hers
age of twenty-three and no. 12 at fourteen.
person, therefore, who developed thyrotoxicosis
on the basis of long-standing simple goitre. No.
treated with X rays twenty-five years ago, and n
thyroidectomy fifteen years ago, both succe
No. 5 died at operation on her toxic thyroid.
and 10 are under treatment with thiouracil. N
interesting as the sole goitrous male represe
Brain (1926) remarks on the rarity of her
goitre in males. All goitres seen were of m
or large size, but that of no. 7 had dim
with age.

Concerning the type of inheritance involved,
R. A. Fisher, F.R.S., comments:

> "I should presume that you had in this family a d
> gene capable of producing nodular goitre in a pr
> of the females and a much smaller proportion of the
> This might be an allelomorph of the commoner r
> gene having a somewhat similar effect, but, of cour
> possible that it is due to a gene h
> *similar effect though at a similar loc*

It has been suggested that the
tary factor responsible for pro
goitre is primarily a defect in util
of iodine (Brain 1926).

Thyrotoxicosis is a well-know
plication of sporadic and endemic n
goitre, but its occurrence here i
members of the family strongly su
an inherited trait. As regard
hereditary tendency to toxic
goitre, it must not be assumed
the same type of inheritance is
cerned in primary Graves's di
which does not develop on the
of pre-existing simple goitre. I



Symbols: square, male; circle, female; hatching, goitrous; black, goitre became toxic; ?, doubtful history of goitre; d, died; x, seen personally by the author or investigated at Selly Oak Hospital. Numerals above the symbols indicate consecutive series of goitrous persons; numerals below the symbols indicate present age or age at death (in years).

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[1] Lichtman, S. S. *Diseases of the Liver, Gallbladder and Bile Ducts.* Philadelphia, 1912; p. 221.

ition a recessive gene is probably involved (Martin).

SUMMARY

family is reported in which eleven females and one have developed nodular goitres. None have ever in an endemic area.

this family there is also a (presumably inherited) ency for the goitres to become toxic, as shown the development of hyperthyroidism in five ibers.

should like to thank Professor Fisher for his comments t the family tree, and Mr. R. P. S. Kelman, medical superident, Selly Oak Hospital, for permission to make use ospital records.

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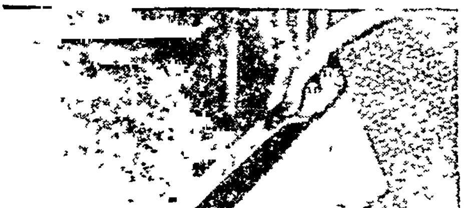
New Inventions

OCKING-HOLDER FOR THE STIFF-JOINTED

NE of the greatest hardships of the man or woman ı severe osteo-arthritis or ankylosis of the hip or knee- t is the inability to put on their socks or stockings shoes unaided. A patient at the Charterhouse ic, infuriated at the daily struggle, devised the ple apparatus here illustrated and found it highly cessful.

t consists of two light strips of metal joined as a n the flat, the shorter piece being curved into a half nd. This half round is furnished with three studs, ced one in the centre and one at either end; and ee lengths of elastic, fixed by a screw to the handle, ry ordinary suspender fastenings which will clip on to studs.



The user has only to fix the top of the stocking or sock the three studs when it will hang in an open loop into ich the foot can be easily inserted and the whole wn up the leg. The handle or long end, shaped e a shoe-horn, renders equally easy the slipping on an elastic-sided shoe or a court shoe. Unfortunately has not so far been possible to devise an instrument draw tight and tie shoe laces.

The instrument is made by Messrs. Down Bros. and Mayer & elps Ltd., of London.

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Reviews of Books

Skeletal Tuberculosis

VINCENTE SANCHIS OLMOS, M.D., assistant director of the Instituto Nacional de Reeducacion de Invalidos de Carabanchel Bajo, Madrid, Spain. Translated by JOHN G. KUHNS, M.D. Baltimore: Williams & Wilkins. London: Baillière, Tindall, and Cox. 1948. Pp. 261. 27*s*. 6*d*.

IT is doubtful whether there is any infective condition more unpredictable in its behaviour than tuberculosis of bones and joints. The initial lesions are diverse—the puffy tuberculous knee, caries sicca of the shoulder, the expansile marrow infection of a phalanx and the metaphyseal spinal lesion, with little bone-destruction yet the source of an enormous cold abscess. The course of the disease is almost equally variable. Often there is a regular progression through a phase of destruction to quiescence, followed by recalcification leading to fibrous and sometimes bony ankylosis of the joint. Yet while one lesion is healing another may appear elsewhere and run its course independently. Sometimes the disease advances relentlessly like a malignant growth, and the battle is a losing one from the start. These irregularities, often complicated still further by the appearance of visceral lesions, compel the clinician to be vigilant in his management of the patient and cautious in giving a prognosis.

In the face of these vagaries, the attitude of most British workers has been one of quiet resignation. Intent on the proper conduct of treatment, in itself a difficult enough task, they have not spent—or, as some might say, wasted—time on trying to explain the phenomena of skeletal tuberculosis, which after all are but part of the whole problem of the host-parasite relationship in tuberculous disease. And tuberculosis is only one of many infective diseases in which the same problem arises in one form or another. Yet it must be confessed that in this respect orthopædic surgeons have lagged behind their colleagues dealing with pulmonary disease. Dr. Sanchis-Olmos's book is a welcome departure from this now almost traditional empiricism. He has done his best to apply theories concerning the pathology of tuberculosis to the behaviour of skeletal lesions; he gives particular prominence to the views of Gonzalez-Aguilar, an Argentine worker, and contributes a number of ideas of his own. His evidence is derived from experience in Spain, and from a detailed analysis of the excellent records of the Peabody Home for Crippled Children which he studied during the course of a visit to Boston.

The first quarter of his book is concerned with pathology; the second with the conventional topics of radiological examination, symptoms, signs, diagnosis, prognosis, and treatment: the other half of the book is a description of the disease as it affects the various parts of the skeleton. The first is by far the most important section, though the other two are unusually interesting in that they are permeated by the ideas and terminology to which the reader is introduced in the section on pathology. Skeletal tuberculosis, Dr. Sanchis-Olmos says, may present as an osteitis or synovitis having one of three forms—exudative, granular, or caseous. (A lesion involving both bone and joint is called *osteo-arthritis*, a logical term, but an unfortunate one for the British reader.) The three types of inflammatory change, it is explained, are not always sharply defined: an exudative process, for example, may be followed by caseation or by granulation. The local lesion also shows an evolutionary pattern in which five phases are distinguishable. The reaction of the patient to his infection is even more complex, there being no less than seven possible phases in the struggle between the host and the parasite, with anything up to five possible events in the four phases following primary infection.

These classifications, derived in part from the theories of earlier workers, are undoubtedly a valiant attempt to explain the various possible sequences of events, which most of us find incomprehensible. They remind one a little of Karl Marx's analysis of human affairs, and seem to be about equally insusceptible of proof. But whereas the average exegesis of Marxian doctrine makes some impression on even the hardened unbeliever, Dr. Sanchis-Olmos leaves even the sympathetic reader bewildered. That there is an explanation of these events nobody can doubt, and a thoughtful clinician can contribute much by careful observation and analysis of his findings; cautious speculation, too, is not out of place. But any hypothesis, even if it is wrong, should at least appear to bring some semblance of order out of chaos. Perhaps the author. in his anxiety to give due weight to the views of others, has not been dogmatic enough: it is certain that he has not been well served by his translator. The result is that his work, although intrinsically attractive, is hardly likely to appeal to those whom, presumably, he is particularly addressing—namely, orthopædic surgeons who are interested in skeletal tuberculosis. Here is an example of the sort of writing that spoils the book: "It (a régime of treatment) has been opposed only by one school, that of Gonzalez-Aguilar, which attempts to establish scientifically the pathogenic and anatomopathologic concepts on which the theory of the biopathologic unity of tuberculosis must be based."

Yet, in spite of its imperfections, this work must be commended to the British reader. It is an indirect and well-deserved rebuke of our empiricism, and perhaps it will provoke some of our own authorities on skeletal tuberculosis to go more deeply into the natural history of what is still, unfortunately, a fairly common and always serious disease.

Conference on Metabolic Aspects of Convalescence

Editor: EDWARD C. REIFENSTEIN, jun., M.D. Transactions of 16th meeting, Oct. 27–28, 1947, and 17th meeting, March 29–30, 1948. New York: Josiah Macy, jun. Foundation. 1949. Pp. 168. $3. Pp. 246. $4.

THE first of these conferences was held in September, 1942, and there have been two or three each year since that time. The published reports contain the original contributions of the speakers and also a full account of the discussions. These consist largely of comments, questions, and verbatim interjections which do not always enhance the interest of the reports to people reading them some months or years later. The general title may be a little misleading to doctors accustomed to discussions on the same subject in this country, for much of the work described and discussed has been carried out on rats; and little of it has any direct bearing on convalescence as the word is usually interpreted here. The volumes really consist of a collection of short descriptions of original work, mostly of a biochemical nature, ranging from studies of blood arginase to adrenogenital hormones and from protein synthesis to citric acid. They will be scanned by scientific workers in search of information bearing on their subject, and many will be found to have considerable interest.

The Chest and Heart

Editors: J. ARTHUR MYERS, PH.D., M.D., professor of medicine and preventive medicine and public health, University of Minnesota, Minneapolis; C. A. MCKINLAY, M.D., associate professor of medicine in the university. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1948. In two vols. Pp. 1850. £7 7*s*.

Professor Myers himself contributes something over 300 pages to this laborious work. From the preface it seems that the book is intended for medical students, for physicians in general practice, and for those in "special fields whose diagnostic and therapeutic problems at times are related to diseases and conditions of the chest and heart." Some of the sections can only be for elementary students, for there is great elaboration of detail in physical examination. As a text for more senior undergraduates it is too long; it does not sufficiently explain which things are important and which are not; and the index, despite its 60 pages, is gravely inadequate. But there are good sections on pulmonary œdema and pulmonary embolism, and a fascinating one on the chemistry of the tubercle bacillus. Boeck's sarcoidosis is well covered, and there is a reasoned statement of the position in regard to "acute pneumonitis." Adenoma of the bronchus receives rather scant mention: and doubts will be felt about the statement that treatment of the "so-called adenoma of the bronchus can be best carried out through the bronchoscope." ends with a long article on thoracoplasty. In are the sections on non-pulmonary tuberculosis (inc abdominal, urogenital, gynæcological, eye, and localisations), the whole of the heart section, and a appendix on the pathogenesis of tuberculosis. heart section is well illustrated, and the artic coronary sclerosis one of the best of its kind. I developments in the surgical treatment of conditions are discussed. The book covers much t but not as much as its size would suggest. It lies where between an elementary textbook for stu didactic in nature, and a major reference wo consultation, and it suffers from the faults of any with a large number of contributors. That is not that it does not contain much wisdom and the of a long experience.

Synopsis of Psychosomatic Diagnosis and T

FLANDERS DUNBAR, M.D. London: Henry 1948. Pp. 501. 32*s*. 6*d*.

"SYNOPSIS" is surely not the right word to de this compilation, for besides quotations from d sources—there are 432 references in the bibliogra it has many case-histories replete with trivial d Apart from those containing introductory materia chapters follow the same order as those of the edition of Osler's *Textbook of Medicine*, which the designed to supplement. The psychological aspe disease are of great importance, but it is doubtful wh Dr. Dunbar's confident psycho-analytic interpreta and sometimes uncritical assertions, will further recognition at any rate among physicians.

Functional Localisation in the Frontal Lobes Cerebellum (London: Oxford University Press. 1949. P 15*s*.).—Those who were privileged to hear Dr. John F. F of Yale, speaking at Birmingham last year—and p even more those who were not so privileged—will rej have his William Withering memorial lectures[1] in form. Neurosurgeons and psychiatrists will be imp by the appeal he makes, in his preface, for cauti leucotomy operations, lest they allow their zeal to their knowledge of function. More, "*If they would o on one side of the brain at a time and make small (which could later be enlarged should this be indic fundamental information will be secured which it be difficult or impossible to obtain from the experin animal.*" What we know already of the basic physiol data is set out in all its intricate detail in this book.

Science, Servant of Man: a Layman's Primer fo Age of Science (London: Sigma. 1949. Pp. 362. 15 By relating the history of the discovery of auxins and application to selective weed-killing, to the productio roots in cuttings of plants, and to the prevention of from falling off the trees too early; the electromag theory and its application to radio and radar; the disco of polymerisation and its application to the synthes rubber and 'Nylon'; the discovery of blood-groups and forensic application as paternity tests; and the classific of foraminifera and its use in prospecting for oil, M Bernard Cohen, instructor in the history of science general education at Harvard University, shows that scie discovery cannot be controlled by planning. "Succe planning necessitates some foreknowledge of the eve result—a meta-science transcending human limitati He maintains that the only way in which planning ca applied to science is not by limiting but by extendin scope of free research and in making use of the resu discoveries. Had planning been in control of scie research a few years ago, he says, we should still be wi penicillin and sulphonamides. He subscribes to Con proposals to provide an educational system which offers equ of opportunity, to make sure that there are plenty of petitive scientific groups, and to beware of instituting dictatorial planning board. He also considers that scientists must be educated to understand what scienc so that every taxpayer will realise his responsibility to scientists their requisite freedom in research. This, in is the main object of his book.

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[1] See *Lancet*, 1948, i, 991.

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THE LANCET

LONDON: SATURDAY, JULY 30, 1949

Dangers of Uniformity

It has long been apparent that one of the effects instituting central control over the formerly dependent unit is a loss of elasticity and of power respond to the diversity of local circumstances. ut it is only now beginning to be realised just what is means. All over the country those who administer e hospitals are waking up to find themselves werless to make common-sense adjustments to laries and wages of hospital staff of every kind. hey are not allowed to pay less than the rates laid wn by the Whitley Councils; that is endurable, for is the intentional result of the organisation of hospital orkers through their professional organisations and ade unions. But now, under the new dispensation, ey are not allowed to pay more, it would never , it is argued, for hospitals dependent on the xchequer to bid against each other; therefore all ust conform and pay the standard rate.

The present understanding that the existing rates e in fact standard rates is open to two important es of criticism which will have to be met. sistence on the rule is laying the hospital services en to the charge of sheer inefficiency. In many lds, hospitals have to compete with commercial nployers, and are subject to the limitations of the cality in which they are situated. If a new factory mes and sits down next door they must be in position to make some response. Circumstances of is kind were difficult enough for the hospitals before e appointed day, for their power of response was en limited. But when it really mattered—when important worker like a cook was in question something could be done. Under the new dispensan that ability to respond has disappeared altogether. would be easy to pile up examples of this kind of efficiency, of which the handicap as against the mmercial competitor is merely one aspect. From other angle it is clear that the rule of uniformity courages all the best personnel to congregate in e most favoured hospital or the areas most pleasant live in. All this adds up to a serious charge of sheer efficiency.

But there is a second line of thought, which is rhaps not quite so obvious but which (once properly asped) should be decisive against the present eference for uniformity above almost all other nsiderations. The mechanism of negotiating achinery between employers and employed depends a system by which the staff side levers the rates from one point to another. It first establishes at in such and such circumstances a specified rate n be justified, and then, relying on the principle of uality for all, gets this rate made universal. The oper counter to these tactics is pretty well understood in the industrial world; it is prompt concession that such and such a job does require special consideration, coupled with a detailed refusal to admit that the change must be made universal (anticipation of a legitimate demand before it becomes a grievance is, of course, one better). In the hospital world this should often mean a rate for a particular hospital—for example on account of the locality. The conduct of the employers' side of negotiations of this kind is a highly skilled matter, and we suspect that in the hospital world the technique is much better understood by the staff side than by the miscellaneous groups that represent the Minister and the taxpayer. (Has the Minister on his staff a really expert negotiator fully versed in these matters? We do not know.) The point here is that from the angle of the Minister, anxious to preserve due economy in the administration of the hospital services, the condition that no hospital ought to be allowed to pay more than the scheduled rate is not intelligent; it is a blunder, as a mere matter of tactics. It is playing into the hands of the other side: it stands therefore doubly condemned—a handicap to the efficiency of the hospital service, and a handy weapon with which to beat the Government. The situation now arising is a challenge to the authorities, and the reputation of the Minister and his advisers will suffer unless steps are promptly taken to meet it. It is not sufficient that they should say "it is a question for the negotiating machinery we have set up," for it is the terms of reference of the negotiating committees that need to be looked at. Enough damage has been done in the nursing world alone by the failure to think clearly on these subjects, and the hospital service is bound to be impaired until the matter has been threshed out.

What then should be done? We would not suggest that we could forthwith revert to the old system whereby each hospital authority settled these matters for itself. Freedom for the hospital to spend a round-sum "budget" is, it is true, a highly desirable objective; but as things stand today it would be idle to press this plan so far as to claim freedom for each hospital management committee to settle salaries and wages entirely regardless of what is being done elsewhere. Some central machinery seems to be inevitable; but it must be tempered with real discretionary power to the people on the spot. A formula—or rather a series of formulæ—must be found to give the hospital management committees some authority to exceed the Whitley Council rates whenever it is really necessary. For example, it might be provided that as regards caterers, cooks, domestics, and other groups where the hospital is in direct competition with non-hospital employers, the hospital management committee might be given authority to exceed the specified rates by as much as 50% provided that the total amount so expended in any one year did not exceed such and such a percentage of the total budget of the management committee. Where such arrangements had to be made permanent the approval of the regional board might be required. In dealing with doctors, nurses, and medical auxiliaries it might be desirable to proceed on different lines—i.e., by the method of a regional (or national) fund analogous to that being evolved to induce the general practitioner to work in the less attractive areas.

Our immediate criticism is not so much of the attempt to exercise some central control as of the crudity in the present arrangements with their reliance on the simple rule of uniformity. The hospital services are vast and complex, and the complexity will have to be matched in the arrangements made. If you have an extensive railway system it is necessary to have a Bradshaw, and the Bradshaw must take account of the gradients of every little branch line. It is no use to say "we shall assume that all trains run at the same speed everywhere." It is no use to say "we shall leave it to each little line to settle matters for itself." Nor, where hospitals are concerned, is it wise to say "we shall assume that everything that is called a hospital is equal to everything else that is called a hospital, and anyone working in one hospital must be paid just the same as someone working in another"—just because they happen to be graded to fall into the same categories in discussions which set out to discover minima for the various groups.

Small-gut Obstruction

OBSTRUCTION of the small intestine is of three main types, which may to some extent overlap. It may be an ileus, where the fault lies in the propulsive mechanism of the gut and no organic obstruction is present; it may be an occlusion of the lumen of the bowel; or it may be a strangulation, when cessation of the blood-supply to a segment of the bowel overshadows in importance the probable concomitant occlusion of the lumen. The distinction between these three main classes of obstruction has become of cardinal importance in the past few years because continuous gastro-intestinal suction has been shown to be astonishingly successful in the right type of case but dangerous in the wrong type. In ileus gastro-intestinal suction is the correct and usually the only treatment needed—it goes almost without saying *that the water and chlorides removed must be replaced* intravenously. In occlusion of the bowel lumen suction is a valuable and often life-saving part of the preparation for operation; it may be prolonged and occasionally may by itself relieve the occlusion. But in strangulation suction is a highly dangerous form of treatment if prolonged for more than the time needed to empty the upper reaches of the alimentary tract and so prevent the patient drowning in his vomit during induction of the anæsthetic. In strangulation no amount of suction can prevent organisms and plasma escaping through a dying bowel wall, or stop arterial blood being pumped into a capillary bed from which there is no venous return. The sooner this migration of the right things to the wrong places is checked by operation the better the patient's chances. AIRD,[1] who has so lucidly interpreted for surgeons the original work of himself and others, has said: "In some quarters the introduction of suction drainage has given a fall in the fatality-rate of occlusion but a rise in that of strangulation, operation in the latter condition being sometimes dangerously delayed by failure to distinguish it from occlusion."

The principles of treatment for small-bowel obstructions are easy to understand. Apart from ileus, whose cause and presence are usually obvious, the main difficulty lies in diagnosis. It is curious t modern advances in the treatment of occ and strangulation—suction drainage, antibiotic intravenous therapy—are directed to over the late features of the obstruction. There is n for them in the great majority of early occl and strangulations. *Early diagnosis permits sa* speedy surgery on a patient whose physiol still nearly normal. It is failure on the part eit the patient to summon medical aid or of the to achieve a diagnosis that provides the c which the correct use of modern aids make difference between life and death. The pati often responsible for delay, but doctors still times miss strangulated inguinal hernias becaus have not looked for them, or, with more e internal obstructions because they could fe lumps. To watch a patient with severe colick in the abdomen and vomiting until he show tension, dehydration, shock, *and signs of inf is to wait dangerously long. Any patient in* the symptoms give reasonable ground for susp obstruction needs to be in hospital. There, d can often be dispelled by a plain X-ray film abdomen to reveal distended coils of bowel are not clinically obvious.

The patient reaching hospital with a late obstru offers a pretty problem to the surgeon if the ca not clear. If there is a tender irreducible hern is reasonably plain sailing. But if the only abn physical sign is a distended abdomen it is diffic know whether to wait, so that suction and venous medication can make the patient with a occlusion safe for surgery, or whether to op at once and not prejudice the chances of a p with an internal strangulation. Two point of some help in these circumstances. Loc tenderness in the abdomen, with rebound tende indicates infection and therefore strangulation; abdominal pain continuing after an hour or tw gastro-intestinal suction shows that the pain is no to colicky contractions of the intestine but to s thing else—probably a strangulation. COLLER BUXTON,[2] in reviewing 198 small-bowel obstructi contend that even in occlusion operation is indica as soon as possible. They record three cases in wh suction drainage relieved the symptoms but bowel perforated at the site of an occluding carcin Their success-rate of 68% in attempts to get a M Abbott tube past the pylorus will be envied by t who have often had to be content with gastric suc because a long tube could not be induced to further. They found that peritonitis was the monest cause of death, and they emphasise a that early diagnosis is the key to lowered morta

Megakaryocytes and Platelets

IN the early days of hæmatology almost e blood-cell was proposed by someone as the mo cell of the platelets. In 1906 J. H. WRIGHT conten that blood-platelets are formed from the cytopl of megakaryocytes, the giant granular cells of bone-marrow; he suggested that these cells p *pseudopodia into the lumen* of blood-vessels, when the pseudopodia break off the fragments f elets. This theory has since held the field against attacks and has recently been confirmed again Saltzman [1] in Sweden and Schwarz [2] in America. Jsing the dark-ground illumination techniques lied by Wallgren to the study of cytoplasmic icture, Saltzman found that the cytoplasm of gakaryocytes and the blood-platelets share some tures of arrangement that are found only in these s, and there are many other points of similarity t occur in few other bone-marrow and blood cells. signs of life were recognised in the platelets; odd protrusions and blisters with granules in wnian movement appear to be quite unchanged the addition of potassium cyanide to the preparans. Schwarz has studied the formation of granules megakaryocytes. The typical megakaryocyte of ne-marrow, with a uniformly granular cytoplasm, ginates from a smaller megakaryoblast that has n-granular cytoplasm. In the megakaryoblast and next stage—the promegakaryocyte—a relatively le zone appears in the cytoplasm next to the lentation in the nucleus; it is within this area at the granules first appear. Schwarz calls this le zone the "functional area," and, by studying any preparations from suitable bone-marrows, he s found that as the megakaryocyte develops this nctional area stains pinkish and the granules become ue: the area spreads as the cell develops until entually it occupies the whole cytoplasm except r a narrow peripheral rim. De la Fuente [3] scribed a similar development, but he thought at granule formation began in several areas simulneously. When the megakaryocyte divides, the nctional area is not involved and remains unaltered size and shape; the nucleus appears to take no rt in granule formation. The megakaryocyte, hwarz points out, thus behaves like any other ll whose cytoplasm develops a "specific functional ansformation." It is only when the cytoplasm is lly granular that platelets are formed, by the eaking up of pseudopodia. Schwarz also discusses e appearances of the megakaryocyte in thrombotopenic purpura, which is well known as a primary sease and also occurs as part of other syndromes ch as aplastic anæmia. Splenectomy is effective eatment for most, though not all, of the primary ses but is useless in the secondary type. Since ie blood-platelets are so much reduced in this form purpura the megakaryocytes have naturally been refully studied in the hope of finding a clue to the tiology of the disease and explaining the occasional ilures of splenectomy. Schwarz finds that the egakaryocytes usually look quite normal; granule rmation in the cytoplasm proceeds in the way scribed above. There is often hyperplasia of the egakaryocytes, and—exactly as with hyperplasia of ther types of marrow cells—early forms are relatively creased. On the other hand, cases have been ported in which the megakaryocytes were reduced r even absent. In another group distinctly abnormal egakaryocytes have been found; a recent example the description by Dameshek and Miller [4] of odd egakaryocytes with non-granular cytoplasm that they call "lymphoid forms." Differences of technique make comparison between different reporters difficult, but deficient granule formation is common to all. Schwarz examined the marrow from 26 patients with primary thrombocytopenic purpura and found deficient granule formation in only a single case. The early megakaryocytes of this patient had a "functional area" that appeared and enlarged as in normal cells, but no granules developed in the area.

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[1] Aird, I. A Companion in Surgical Studies. Edinburgh, 1949.

[2] Coller, F. A., Buxton, R. W. *J. Amer. med. Ass.* 1949, 140,

There thus seem to be three types of primary thrombocytopenic purpura: (1) the common type with normal megakaryocytes, (2) a type in which granule formation fails, and (3) one in which the megakaryocytes are degenerate or show cytotoxic changes. The second type, in particular, has had undue publicity, but Schwarz's estimate that only about 4% of patients show abnormal marrow pictures will surely be supported by anyone with experience in this difficult field. Consequently statements that splenectomy in thrombocytopenic purpura should only be recommended if a characteristic marrow picture is found [5] are premature. The knowledge that the clinical syndrome of thrombocytopenic purpura has a varied marrow picture may enable us to sort out those whom splenectomy is less likely to benefit, but the evidence has yet to be produced.

Annotations

ROYAL MEDICAL BENEVOLENT FUND

> "Letters of inquiry from medical men which reach the office from time to time lead the Committee to conclude that deserving cases fully entitled to relief fail to be directed to the Fund."

Mr. R. M. Handfield-Jones,[6] chairman of the committee of management of the Royal Medical Benevolent Fund, reports that in spite of the efforts of the central office and the local secretaries, the ladies' guild, and the British Medical Association, many doctors are still unaware of the work and scope of the Fund. How wide this scope is may be judged from the Fund's "proud tradition for a great many years that no applicant, medical man or woman, wife, widow, or child, is refused assistance if the need is real." Moreover, it is not only subscribers, or the relatives of subscribers, who are entitled to apply for help: the Fund is ready to help the whole profession. At the case-committee meetings none of the members knows whether the applicant has been a subscriber or not. Those who have contributed regularly to the Fund realise this already; but in order to explain the work of the Fund to the profession at large the annual report is this year being sent to every doctor in England, Scotland, and Wales. Since the little booklet is filled mainly with accounts, it does not take five minutes to glance through the four pages allotted to Mr. Handfield-Jones. The information he packs into them has a personal interest for us all, since as he says "an honourable and learned profession should be able to cope with its own casualties." He foresees many years of necessary work for the Fund, despite national insurance: for even the most benevolent of national schemes cannot take account of all the ills that flesh is heir to, all the disasters which may overtake a doctor's family when he is disabled or struck down. Mr. Handfield-Jones quotes two cases characteristic of those which came before the Fund: an aged doctor, infirm with failing vision, is trying to carry on practice to support an invalid wife;

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1. Saltzman, G.-F. *Acta med. scand.* 1949, 132, suppl. 221.
2. Schwarz, E. *Arch. Path.* 1948, 45, 333, 342.
3. De la Fuente, V. *Arch. intern. Med.* 1946, 79, 387.
4. Dameshek, W., Miller, E. B. *Blood*, 1946, 1, 27.
5. Scott, R. B. *Brit. med. J.* 1949, i, 1063.
6. Annual report, 1948. Obtainable from the secretary, 1, Balliol House, Manor Fields, Putney, London, S.W.15.

a man under fifty with malignant hypertension, whose wife must stay at home to nurse him, has three children who need help to complete their education.

In such circumstances as these, grants are vain unless they are generous, and therefore the Fund has need of more than all the money it raises. In the last thirteen years subscriptions have increased from £13,500 yearly to £23,900—an increase of more than £10,000 yearly over a period which includes the second world war. Last year the Fund's income was £36,968; and £32,000 of this went out to relieve poverty and distress. Some, moreover, went to maintain Westmoreland Lodge, the residential home at Wimbledon now happily occupied by twelve elderly ladies, beneficiaries of the Fund, who had been living lonely and straitened lives in single rooms. Over £2300 was distributed in Christmas gifts to the fund's beneficiaries.

No appeal for funds has ever been made to the general public: this is our own responsibility and one which the profession as a whole can well carry. It is surely right that such an intimate and benevolent undertaking should, as the report says, claim the interest of every member of our profession.

POSTERIOR CULDOSCOPY

In the United States some gynæcologists are using endoscopy of the pouch of Douglas through the posterior fornix as an alternative to exploratory laparotomy, and the bastard French-Greek term "culdoscopy" has been applied to this procedure. Abdominal peritoneoscopy has never caught on widely here, though it is nearly forty years since it was first thought of, but this approach through the posterior fornix is said to avoid the undesirable features of abdominal puncture. Decker[1] gives a detailed description of the technique. The patient must be examined in the knee-chest position or the view will be obscured by coils of intestine. Unfortunately, this is the most disconcerting of all positions for the unanæsthetised patient. With the help of procaine local anæsthesia the trocar is inserted through the posterior fornix, and a pneumoperitoneum results at once if the pouch of Douglas has been successfully perforated. Either carbon dioxide or air can thus be admitted and the intestines tend to fall out of the way. The electrically lit culdoscope is then inserted and the pelvic cavity visually explored. Decker describes his experiences in 77 cases selected because of difficulty in diagnosis, and Te Linde and Rutledge[2] give a similar series of 56 cases. In about 10% of the patients the operation failed, either because of a loosely attached peritoneum which "rides ahead of the trocar" or because of a pelvic mass or adhesions. Neither series was marred by visceral injury, hæmorrhage, or peritonitis.

The cases for which this investigation is regarded as suitable are the differential diagnostic problems of ectopic pregnancy, pelvic inflammatory diseases, acute and "chronic" appendicitis, pelvic tuberculosis, and endometriosis, and for assessing the state of the pelvic organs in sterility. The claims are too sweeping to be ignored, but it is doubtful whether this procedure will be used much in this country. With accurate clinical examination and the accessory laboratory aids, such as leucocyte-counts and endometrial biopsy, the proportion of cases in which culdoscopy might be useful should be small. Then, it is in just the cases which often invite visual inspection of the pelvic organs—e.g., cases of chronic pelvic pain with a tender fixed retroversion or an indefinite tender mass—that the risks of such an inspection from perforating adherent intestine would seem to outweigh its possible advantages; moreover, in these cases the field would sometimes be obscured by adhesions, pus, or tarry blood. Of all the forms of gynæcological examination, this must be among the rigorous from the patient's point of view—its use cases of sterility may lead the cynic to wonder w next these unfortunate women will have to endure in next hundred years. Nevertheless, when he the frequency of errors in clinical diagnosis, the of unnecessary laparotomies done, and the temptatio radical surgery which abdominal exposure of pelvic viscera presents, even the most conservat gynæcologist will acknowledge that culdoscopy attractions.

HOUSEWIFE'S LOAD

The housewife is the freelance of the labour mark and the diagnostic sign of a freelance is that he is n free. The job which can be done "in any odd is at the mercy of anyone who cares to interrupt and everybody borrows time from the one member the family whose time is not sold in neat sections, down with a whistle at either end. Last year Dr. Instone[1] made a study of 61 Sussex housewives, found that their state of health was not good for the lives they had to lead. They were nearly tired, many had varicose veins and postural defe some had bad teeth or bad feet, some were stout hypertensive. Their fatigue, she thought, was not lack of sleep, but rather to much standing in and basket-carrying, and to faulty feeding (many them making a practice of giving up their protein other members of the family). Dr. Dagmar Wilso has now made two small studies, the first of Oxfordshire, Berkshire, and South Devon women, 127 them townswomen and 67 rural. Unlike Dr. she heard few complaints about shopping. Most of women were interested in cooking and satisfied their cooking arrangements. Some complained of to share their homes with additional relatives, spoke more approvingly of lodgers, who contrib to expenses without being so much of a strain on temper. More than half of them were married to workers, nearly a third to unskilled workers, and t remaining 4·3% to professional workers. Over quarters reported some sort of strain or stress— crowding, deficient water-supply, and loneliness whe children had left home being among these. Only 7 were under medical care, but physical suggested that a further 31% needed medical or treatment. In addition, over three-quarters had foo troubles such as flat-feet, corns, or bunions, and 12% had varicose veins.

The second survey was made on a group of 57 women between the ages of forty and sixty who had lived for nearly three years on "an estate of 250 houses situated on a sandy hilltop near the city boundary and circum scribed by fields and gardens." She found 20 of them good health; the rest complained of such things menopausal symptoms, gynæcological disorders, tory and gastro-intestinal ailments, nervousness, diseases of the bones and legs. Only 3 of this had foot troubles; 1 had severe varicose veins; 5 simple goitre and 1 was myxœdematous. Only 2 under a doctor's care at the time of the inquiry, was felt that a further 11 should be having me advice. In this group nearly a quarter were the of professional workers, and nearly two-thirds wives skilled workers; only about a tenth were married unskilled workers. There was only 1 case of crowding. All but 6 were satisfied with their arrangements, and their food was probably in caloric value, though they complained of mono and here again a large proportion of them gave up or part of their protein ration to other members of family. Unlike the first group they suffered little

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1. Decker, A. *J. Amer. med. Ass.* 1949, 140, 378.
2. Te Linde, R. W., Rutledge, F. *Amer. J. Obstet. Gynec.* 1948 55, 102.

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1. *Lancet*, 1948, ii, 899.
2. *Publ. Hlth, Lond.* April, 1949, p. 130.

tress. Dr. Wilson concludes that fatigue and foot ble are—as might be expected—partly the outcome cial factors. It is surely noteworthy and unexpected, ever, that in the first group the main leisure activity reading; in the second, more surburban, group the interests were radio, reading, or the cinema. In groups there were women who enjoyed communal ities, such as those of the women's institutes.

ese findings, suggestive rather than striking, might be followed up by wider surveys. There seems to ood evidence that housewives neglect their ailments, o some of their protein ration, and suffer—anyhow he lower income-groups—from undue fatigue. It ot be that in every case they do these things because, he men say when ringing pigs, they like it.

SYNCHROTRON AT THE ROYAL CANCER HOSPITAL

HE synchrotron, or to give it its correct name the -synchrotron, which has now been installed in the ical physics department of the Royal Cancer Hospital, inspected by senior officials from the Ministry of lth and others on July 5. With this device electrons be accelerated to extremely high energies and can efore be used as a source of very penetrating X iation. The electrons are accelerated, not by allowing n to move between electrodes across which a high-age difference is maintained, as with the usual ay equipment, but by the action of a changing netic field together with a special type of radio-uency oscillator. A beam of electrons is emitted n an "electron gun" inside an evacuated glass vessel between the poles of a large electro-magnet. Under action of the magnetic field the beam of electrons es in a circular orbit in the glass vessel, and as the gnetic field is increased and the radio-frequency llator brought into action the electrons are accelerated their orbit. By careful design of the apparatus the trons may be made to move round the same circular it with increasing energy until they strike a target so produce X rays. An X-ray tube running at million volts would be required in order to produce rays of the same penetration as those produced by s synchrotron.

n the last few years it has become clear that progress the radiation treatment of deep-seated cancer depends being able to apply radiations of greater penetrating wer. When the first betatron was described by Kerst the United States, it was realised that this instrument d great promise in the treatment of deep-seated cer, but that much work must be done before it ld be used with safety and precision. Now, for the st time, a synchrotron has been introduced into a spital for full-time use. The apparatus installed at Royal Cancer Hospital is the first of two developed this country for the Medical Research Council, which s borne the cost; the second is now being installed in department of radiotherapeutics at the University Cambridge. The research work on these instruments s been done largely at the Telecommunications search Establishment, Great Malvern, which is now rt of the Atomic Energy Research Establishment; magnets and much of the electrical apparatus have en built by the English Electric Company, Stafford.

The synchrotron at the Royal Cancer Hospital is used in a basement laboratory which is partly under-ound, so a large measure of very efficient natural otection is provided against the penetrating radiation. e magnet assembly from which the beam of X rays l emerge is reasonably small, being a cylinder 4 ft. in ameter and 4 ft. high; but there is a considerable ount of ancillary apparatus which is housed a short stance away. Protection of personnel is one of the ain problems; and members of the hospital's physics aff have studied the subject on betatrons and similar devices in America. Concrete bricks in walls 3 ft. thick have been used as the main protection for the operator's room. Before the instrument can be used for clinical work, much physicial and biological investigation has to be done with a view to measuring dosage and the distribution of the dose in the body. Owing to the particular characteristics of this very high energy radiation it will be possible, using a single field, to give a dose several centimetres under the skin several times as great as that received by the skin, so skin tolerance should no longer be a limiting factor in the treatment of deep-seated neoplasms. Clearly, however, it will be necessary first to learn precisely the distribution of dose in a medium similar to the body, since otherwise great damage might unwittingly be done in clinical use.

The synchrotron provides no fundamentally new method of treatment, but it is a technical development that promises help in one of the most baffling conditions with which medical science has to deal.

NERVE-ENDINGS OF THE NIPPLE

THE nipple, like a one-note man in an orchestra, appears unobtrusively, gets ready, and, having only a small part to play, is hardly recognised to have a part at all. Nevertheless, the nipple is more than a passive connecting link. It is an organ with positive physiological activity peculiar to itself. Cathcart and his colleagues[1] in Glasgow have stimulated thought on the subject by describing nerve structures in the nipple and drawing attention to its profuse innervation, both somatic and sympathetic. The nerve-endings which they have demonstrated by modern methods of staining conform in the main to the perceived sensory responses of the nipple. The foremost of these, pain, is presumably transmitted by the free endings which abound. Light touch is not felt on the surface and no nerve-endings were found of the types shown by Woollard and his co-workers to be concerned in its perception. More than a light touch on the nipple is recognised either by the deeper layers or by structures deep to the nipple. It is not surprising therefore that lamellated corpuscles of the Pacini type were only found behind the nipple. Heat and cold are keenly felt by the nipple; Krause end-bulbs were seen in it but no clearly recognised Ruffini endings to register warmth.

There must also be sensory responses peculiar to the nipple or to its adjacent tissues, though they are not clearly felt in consciousness. Their anatomical basis is still elusive and their separate existences uncertain. Among these is the one evoking posterior pituitary secretion, which leads in the full breast to the process recognised as the draught. The sensory receptors for this are thought to lie in or behind the nipple rather than within the mammary gland proper. Stimulation of the nipple itself or of the skin very near to it is apparently the specific stimulus here, though secondarily the reflex can become conditioned to many stimuli. Then there is the response to touch in the neighbourhood of the nipple which produces contraction of smooth muscle beneath the areola. This in turn makes the nipple stand out and the areola pucker. Although one may latinise the description and speak of erection of the nipple the word gives a false idea of the process, which is akin to that which makes goose flesh and does not appear to be vascular in nature. The contraction of the areolar muscle makes a knob of a flaccid nipple so that on contact the baby's cheek feels the nipple. It also provides a device like a cherry on the end of a wide soft stalk which the baby's mouth can draw in. Next there must be some nervous response to suckling which maintains the secretion of milk, for in animals secretion fails after denervation unless maintained by suckling at another intact nipple. Despite the traditional

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1. Cathcart, E. P., Gairns, F. W., Garven, H. S. D. *Trans. roy. Soc. Edinb.* 1948, 61, 699.

view it probably does not arise from the fullness or emptiness of the mammary gland. How far this process which calls out the formation of milk is linked with the posterior-pituitary evoking one is unknown.

There is some evidence of sphincter action within the human nipple and sphincteric tissue has been described there. Now Cathcart et al. report finding a new type of neurofibrillar network, with an outline suggesting an oak leaf, ending in it. A comprehensive account of the histology of the nipple, which these workers hope soon to give, should add considerably to our knowledge of the responses to stimulation of the nipple, but it is essential that structural work of this kind should be correlated wherever possible with function.

THE N.H.S.

For inquirers at home and abroad the Ministry of Health and the Central Office of Information have produced a brief and readable account of the National Health Service.[1] This points out that the N.H.S. and the related social interprises require "large resources which can be made available only by the determined efforts of a people paying its way by its work"; but it argues that, considering everything, the service has at least been launched with remarkable smoothness.

> "All big social changes start with a certain amount of uncertainty, until people get used to the new way of doing things; and this Service cannot be comprehensive in the fullest sense until the country is farther along the road to prosperity and a rising standard of life. The public has still to learn how to use the new facilities properly and economically; and those who are actually running the Service have to get used to new conditions and changing needs. But if the various professions really join forces with the laymen in the organisation described in this booklet, they can carry out a progressive new deal in medical care which will redound to the benefit of all."

As might be expected, much is made of the need to change a state of affairs in which the hospitals were owned by "some 2000 separate, and often jealous and conflicting, local public or voluntary authorities": "new forms of organisation were required to rescue the health of the people from what Lord Horder called 'the maze, the unwieldiness, the overlap, the uneconomy, the lack of integration of our health services.'" On the other hand, it is recognised that it would be wrong for medical needs to be met everywhere in the same way: "medicine thrives on experiment and comparison of different ways of doing things; uniformity of method or belief is its enemy." Those who hold that too much attention is being paid to curative medicine may get some comfort from reading that the present expenditure on the N.H.S. (which amounts to about 2*s.* 6*d.* per head per week) "can be justified only on the basis that the essential aim of the Service, and all who work in it, must be to *prevent* illness." Similarly, proper emphasis is laid on medical care in the home as contrasted with care in hospital: the pamphlet says that "for nearly everybody the family doctor is the pivot of the whole scheme apart from dental treatment," and describes how fuller use of the home (or district) nurse, of home-help services, and of sickroom equipment provided by local authorities will prevent unnecessary admissions to hospital.

At a time when capital expenditure must be kept to a minimum, and only the most urgent schemes for the extension or repair of hospitals can be permitted, the building of comprehensive health centres "on any scale" is considered impossible. We are also told once again that "more study is also needed of the kinds of centres most worth trying out before any large-scale experiments are launched." However, it is encouraging to hear that "the building and testing of health centres in action, in different forms and circumstances, in large towns and small, in suburbs and country areas, is a task for the next few years." This leads up to the st understatement that "during that time a great perhaps most, family doctors will continue to p outside health centres." Similarly irritating i remark that in the old days "the family doctor, w single-handed or in a small partnership, usually h much to do because he had too many patients, insuf help, and insufficient equipment, and he was except with great difficulty to keep up to date or to reasonable leisure." Little attempt is made to e how the coming of the N.H.S. has improved the ditions for general practice or arrested their deterior

The pamphlet does not go far below the surface the light in which it describes the N.H.S. is nat rosy. Nevertheless, like the Ministry, we hope t will be read by "those who are workers in the Se without whose understanding and whole-hearted ef cannot succeed." Any description of the service brings us back to its main objects is useful at the p time, reminding us that more is at stake than of service.

A FIVE-YEAR PLAN

Six years ago Lord Nuffield endowed the Nu Foundation with £10 million and urged them to g with the job of promoting the health and well-bei mankind. The first year was spent quietly m plans, and by the end of their first active quinquen from their total income of £2³/₄ million the found have given away £2¹/₄ million in grants. To give use is a responsible and exacting task, but the found have known how to be at once discriminating and and their grants range from £100,000 for the Unive of London's chair of child health to £1500 to enabl Medical Research Society to purchase *Clinical Scien* memory of Sir Thomas Lewis.

In their fourth report[1] the foundation, besides gi an account of their stewardship, also deal with plans for the future. In continuing to further the he and well-being of mankind they hope to help in discovery of new knowledge especially in biology social studies—sciences which they feel have been la somewhat overshadowed by the more fashionable ph and economics. They are also anxious to encourage application of existing knowledge to everyday t especially by joint effort among groups of expe Through the National Corporation for the Care of People the foundation look forward to continuing th work on behalf of the old, especially the arrangem for the care of the semi-sick who at present tend to neglected because of the gap between the hospi authorities and the local authorities. From their ow resources and as trustees of the Oliver Bird Fund th will also continue to support research into chro rheumatism.

In the last twenty years research has become incre ingly expensive. Today the man in the small s private laboratory is at best grievously handicap To achieve his utmost he may need access to facil which can only be provided by the Government, a uni sity, or a large commercial firm. But this does mean that the private patron should go out of busin As the foundation point out, he has the urgent task seeing that "creative minorities" get a first hea and a chance of wider support. In their budget the next five years the foundation have therefore o more made provisions for fellowships and training gr which will help the unique individual and pro to get their chance.

Prof. **Hilda Lloyd** has been elected president of Royal College of Obstetricians and Gynæcologists succession to Sir William Gilliatt. She will ass office in October.

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[1] H.M. Stationery Office. 1949. Pp. 36. 6*d.*

[1] Obtainable from 12, Mecklenburgh Square, London, W.C.1.

INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY

JRING the week beginning on Monday, July 18, 1300 delegates, from forty nations, attended this erence in weather which gave them the opportunity eing London at its best. The delegates agreed that meeting—the first since the war and the fourth the original congress in 1928—proved to be the best nised and the most generally successful of the series. ceremonies and discussions were held at King's ege in the Strand, and it was clear to each delegate oon as he entered the college to register that his rtainment, his accommodation, and the conduct of multitudinous items of the congress had been carefully ned. Mr. F. C. W. Capps, the general secretary, been engaged on the detailed plans for two years, the experienced help of the secretariat of the Royal ege of Surgeons. Mr. W. A. Mill was financial etary, Mr. G. H. Bateman academic secretary, F. C. Ormerod and Mr. C. P. Wilson scientific etaries, and Mr. Myles L. Formby reception secretary. chairman of the ladies' committee was Mrs. V. E. gus. The president, Mr. V. E. Negus, infused a py spirit of international friendliness into the ceedings.

he great hall of King's College was crowded when the chess of Kent arrived to declare the congress open. hoped that it would prove important not only as orum for the exchange of medical ideas but also as means of furthering international understanding. f. F. R. Nager, speaking for the visitors from overs, expressed the gratitude which they all felt at the d which Great Britain was giving the world in its rch for peace.

The profusion of the fare provided made it impossible the delegates to attend every session. They were nstantly faced with the need to decide where they uld spend any given moment—for instance, there were erally no fewer than four academic sessions in progress one time, and beyond these there were the attractions demonstrations, films, exhibitions, visits to hospitals, d sight-seeing tours.

Exhibitions of surgical instruments, of hearing-aids, medical books, and to illustrate the history of otoyngology were well patronised. Despite the journey the fourth floor that it entailed, the collection of atomical and pathological specimens attracted many sitors. On this floor too were to be seen Dr. Gray's markable specimens illustrating the anatomy of the ner ear, and Mr. Negus's unique collection of ecimens demonstrating the comparative anatomy of e larynx.

The exhibitions of medical films were particularly pular, perhaps not only because of their individual cellence but also because they circumvented the curse Babel. If "The function of the ear in health and sease," produced by Dr. H. G. Kobrak, of Chicago, d the "Slow motion film of movements of vocal cords" oduced by the Edison Bell Co. are representative of e general level of achievement, one can say that the edical film is among the most noteworthy of the cent advances in medical teaching.

Some idea of the lavish social programme may be thered from the following diary: *Monday,* President's eception in the Gardens of the Zoological Society London. *Tuesday,* banquet at the Dorchester otel. *Wednesday,* reception by His Majesty's overnment. *Thursday,* receptions by the London ounty Council and at the Royal Society of Medicine. *riday,* reception at the Royal College of Surgeons of ngland.

ANTIBIOTICS AND CHEMOTHERAPY IN SINUSITIS

The proceedings began with a film made by Dr. Paul Hollinger (Chicago) illustrating his technique of motion photography in colour of the structures of the ear, nose, and throat in health and disease. The perfection of the photography was new to many of the European delegates.

After lunch the academic programme began in earnest, with papers by two British pioneers in the study of antibacterial drugs. Sir Alexander Fleming, F.R.S., gave an account of the ways in which the blood-level of penicillin could be maintained throughout the twenty-four hours. He referred to the more recent antibiotics —streptomycin, aureomycin, and chloromycetin—and to the effects which might be expected from a mixture of these substances. The organisms causing sinusitis were much the same as those responsible for other respiratory infections, and we had antibiotics to deal with all of them; the problem was to get the drug to the seat of the infection.

Sir Lionel Whitby asked: "Have the sulphonamide drugs any place in treatment now that we are armed with antibiotics?" His answer was "Yes," first on the score of their availability and secondly because of their action on the gram-negative bacteria. He indicated the conditions under which these drugs could be expected to exert their maximum effect, and stressed the importance, in otolaryngology, of free drainage of secretions.

Prof. Carlos Larroudé (Lisbon) also emphasised the need for drainage of pus whenever it was present. The real value of these therapeutic agents lay in the treatment of acute rather than chronic disease. The symptoms of acute sinusitis and its complications were greatly modified where these drugs were used, and this opened up a new field for clinical study.

Subsequent speakers amplified Sir Alexander Fleming's remarks on the uselessness of administering penicillin if local factors were preventing its concentration at the site of the disease. Prof. J. J. Barroilhet (Santiago) felt that this was never achieved by the use of aerosols, and Mr. E. G. Collins described his experience with indwelling ureteric catheters as a means of applying penicillin to the maxillary antra of children for the relief of subacute antritis.

Two points stand out from this afternoon's proceedings: (1) penicillin and other antibacterial drugs do not replace, but are a valuable adjunct to, surgery in the treatment of nasal sinusitis and its complications; and (2) these drugs are useless unless they reach the infected tissue in sufficient concentration.

AURAL VERTIGO

Prof. F. R. Nager (Zürich), in opening this session, dealt principally with the question whether labyrinthine hydrops in the absence of inflammation could be regarded as the fundamental lesion in Ménière's disease. He showed some beautiful microscopical sections through the labyrinth from a variety of sources, illustrating the frequency with which these findings were present. In his opinion in two-thirds of all cases of Ménière's disease a non-inflammatory labyrinthine hydrops could be demonstrated.

It was a great disappointment to the several hundred delegates present that Prof. C. Nylén (Uppsala) was too ill to attend. His paper was read by Dr. G. Herberts (Uppsala). Over many years Professor Nylén's experience had led him to advocate conservative treatment in most cases of aural vertigo, and 70% of 180 patients recently followed up had been so treated. He considered it necessary to investigate each case carefully, to exclude a central neurological lesion. A proportion he considered to be circulatory and others allergic in origin. In suitable cases his suggested treatment included a modification of Day's operative procedure.

Dr. W. J. **McNally** (*Montreal*) reviewed a series of 200 cases, treated by him over ten years. His most important conclusion was that spontaneous remission with an average duration of four years was common in Ménière's disease. This necessitated the greatest caution in assessing results of treatment. It was not wise to speak of cure until a case had been free from symptoms for five years. Failure to appreciate this fact might lead to the most misleading interpretation of the value of this or that remedy. Like Professor Nylén he held that surgery should be reserved for the very few selected cases. He wondered if, in destroying the labyrinth, we were not sometimes interfering with Nature's danger signal.

It was clear that Dr. McNally's paper had had its effect on those who took part in the discussion. For instance, Mr. **Garnett Passe** was at pains to interpret his results after upper dorsal sympathectomy as being symptomatic improvement rather than cure.

Dr. C.-A. **Hamberger** (Stockholm) gave an account of his work on guineapigs, in which he had attempted to identify the lesion produced by streptomycin. He had found lesions both in the vestibular nuclei and in the vestibular ganglion, and he wondered if the former were secondary to the latter.

Prof. G. **Portmann** (Bordeaux) urged that a place remained for decompression of the labyrinth by removal of the saccus endolymphaticus. Mr. T. E. **Cawthorne** described the technique of his operation in which he avulses the membranous horizontal canal of the labyrinth. He also analysed his recent results.

A great impression was undoubtedly made by Dr. McNally, and the audience went away determined to be more cautious in future in the interpretation of their results.

NON-MALIGNANT STRICTURES OF THE THORACIC ŒSOPHAGUS

Dr. **Gabriel Tucker** (Philadelphia) concentrated on strictures of three ætiologies—the congenital, the short œsophagus with *intrathoracic stomach*, and the stricture following caustic burns. With the aid of an excellent colour film, he demonstrated the technique of retrograde dilatation. The patients, two of whom were children, were seen swallowing a length of string, the end of which was later recovered from the stomach through a gastrostomy by the aid of a sucker. Bougies attached to this string were then drawn up the œsophagus.

Prof. J. **Terracol** (Montpellier) described the frequency with which caustic burns of the œsophagus were encountered in France. He indicated his treatment, which appeared to agree with *that of the previous* speaker.

Dr. P. G. **Gerlings** (Amsterdam) also remarked on the common occurrence of caustic burns, which had become increasingly frequent during the war. He stressed the vital importance of skill and judgment born of long experience in the treatment of these cases, and advocated transthoracic resection of the stricture where bouginage is impracticable. Speaking of the treatment of short œsophagus and associated stricture, he dwelt on the insufficiency of the cardiac valve and the regurgitation of gastric juices as ætiological factors.

The **President** paid tribute to the hydrostatic bag as an invaluable instrument in achieving dilatation of strictures of the lower œsophagus. He pointed out that the credit for introducing this to the medical world should go to Dr. Tucker.

In the general discussion various speakers attention to the frequency of caustic burns of the phagus, which are apparently much more co abroad than in Great Britain. Dr. C. L. J (Philadelphia) referred to the legislation which had necessary in an attempt to reduce the number of due to children drinking caustics by accident. D **Holinger** (Chicago) drew attention to the in number of postoperative strictures. The more a surgery of the œsophagus, as practised today, presenting endoscopists with a new problem, annular stricture at the site of œsophagogastrostom

The consensus of opinion on the value of an in string in the treatment of severe strictures was lised by Dr. L. H. **Clerf** (Philadelphia). This and *the importance of gentleness and perseveranc* treatment were the main items which the stored in his memory.

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In addition to these combined sessions, other were held throughout the week under the of the vice-presidents: Mr. **Kennedy Hunter**, G. **Ewart Martin**, Mr. W. M. **Mollison**, Mr. R. **Owen**, and Mr. A. J. M. **Wright**.

On leaving the congress, an Italian surgeon overheard to make a remark which *will serve* as epitome of the spirit which animated all the proceedi "Politicians create the barriers between nations; throws them down."

Medicine and the Law

Duration of Pregnancy

The case of the 360-day baby, if it may so be is to go to the House of Lords. The husband's was that he was serving overseas from June 17, 194 February, 1946, when he was demobilised. He leave in August, 1945, which he spent with his w A child was born in August, 1946. In the Court Appeal Lord Justice Denning observed that the dat the birth meant, in the ordinary course of events, the child was conceived in November, 1945. In opinion the suggestion that the period of gestation 360 days could be called fantastic. Once it was that the husband was not in England at the time, was an irresistible inference that the child was concei in adultery. Lord Justice Denning was prepared grant the husband a decree *nisi* in his application for divorce, but his two colleagues took a different Lord Justice Bucknill thought that the scientific eviden had better be re-examined at a new trial; there was clear scientific evidence on the point at issue. The court must balance the probabilities one against an and not regard it as a question of law. Lord Asquith concurred with Lord Justice Bucknill. *view of the want of unanimity in the Court of* leave was given for the parties to appeal to the H of Lords.

Not many days ago the Court of Appeal refused application by the husband to call fresh evidence. ground of refusal was that the *proposed* evidence perfectly well have been given at the original Now the Court of Appeal has ordered (subject, of to any review of its decision by the House of that there must be a new *trial when it will be* open the parties to call the best medical evidence *There have been, as Lord Justice Bucknill* remar cases of unsuccessful allegations of misconduct babies had been born 346 and 349 days after the opportunity for marital intercourse. Counsel for husband has argued that the courts will have to the line somewhere.

Special Articles

ON-MEDICAL CARE OF CHRONICALLY ILL CHILDREN IN HOSPITAL

B. W. MACLENNAN
B.Sc. Lond.

THOUGH much progress has lately been made in child ychology, there has been little attempt to apply this w knowledge to sick children in hospital, apart from e important work of Spence (1947), in Newcastle, and some workers in America (Gorniak 1941, Bettelheim d Sylvester 1947, Sutton 1947, Benjamin and eatherly 1947, Szurek 1947, Davidoff 1948, Jensen d Comly 1948); yet nowhere is there a greater need relate modern scientific thought to routine hospital ractice.

When one considers the non-medical care of chronically l children, the problem appears to fall into two parts; rst, the discipline and organisation of the ward, and econdly, the emotional needs of the individual child.

DISCIPLINE AND ORGANISATION OF THE WARD

If one examines the layout and organisation of the ormal hospital ward, one can understand how its iscipline often tends to become authoritarian and rbitrary. Both the size and shape of the ward may ead to this situation. Most wards are long and narrow, shape which makes it difficult to see what is going n at the far end and therefore complicates control. he number of beds is also important—20 to 25 children s far too many for easy control; 11 is probably the ideal umber for chronically ill children, and there should ertainly never be more than 15 in a ward. There hould also, of course, be one or two single and wo-bedded rooms.

The doctor's work, unless he takes particular care, laces him on a superior level to the rest of the staff nd makes him seem rather an unapproachable person o the small child in bed. As a general rule, his ward ounds are an awesome ritual, while even his most ursory examinations are undertaken in a strictly nforced silence.

Although the sister often makes a great effort to take he place of the mother with the child, she is generally oo busy to have frequent contact with individual atients and is forced to multiply regulations in order o get through the work. Also, owing to the traditional raining of nurses, undue emphasis is commonly laid on uiet, order, and cleanliness, while, in the achievement of these, it is forgotten that the patient is an actual person and not a mere adjunct to the hospital bed.

This attitude is often reinforced by that of the matron, who also insists on perfectly tidy beds, spotless lockers, and a respectful silence on her appearance. To quote an example:

> A sister had been planning an Easter treat for the ward, but the matron decided that this would be a good opportunity to take an inventory of ward equipment, and all other plans had to be laid aside.

The effect of this attitude is twofold. First, it thwarts the natural instincts of the child to be noisy, untidy, and dirty. If carried far enough, it will lead either to extreme submissiveness or to submissiveness alternating with periods of uncontrollable wildness. Secondly, it tends to harass the rest of the nursing staff, who are no longer able to be kind and affectionate to their charges but are overoccupied with routine duties.

When nurses have too much to do and too many children under their charge, they feel that their control is weak, and that they have not sufficient time to investigate any difficulties which arise. This makes discipline arbitrary. The following are examples of this:

> A few children played a practical joke on another child, with the result that there was some screaming and much laughter. The nurse-in-charge dashed up, picked out one child, and, without inquiring what had occurred, sent him off to bed. All the children felt considerable resentment, and the little boy, who was in any case rather unstable, cried for over an hour.
>
> On another occasion, two or three boys were fighting. The doctor came into the ward and deprived all the children of a treat to which they had been looking forward for some time.
>
> On a third occasion, there was to be a special supper and a show after it. The children were sitting round talking or helping to lay the supper table. The noise was not excessive, nor was there more excitement than might have been expected. The staff nurse came in and shouted that the next child to make a noise would not be allowed to go to the show. A few minutes later she came back and told one of the little girls, who was certainly not making any more noise than anyone else, to go back to bed, and decreed that the next child to talk at all would be treated in the same way. The ward was left in dismayed silence, and to a great extent the whole treat was spoiled.

Punishment is rarely necessary at all, if the nurses have the time and the knowledge to investigate the situation properly, and if they do not go in such fear of higher authority that they themselves become tyrannical.

Age-distribution is a much-discussed problem in hospitals which deal with chronically ill children. It is probably better to separate older and younger patients, both from the point of view of easy handling and because otherwise the younger tend to be too much dominated by the older children. Sometimes, too, the young children act only as satellites to the older groups, finding it difficult to make friends of their own age.

Girls and boys who have left school and started work present a special problem, for they consider themselves grown up and resent being put in a children's ward: sometimes the staff make this resentment worse by forgetting how old and responsible such patients feel, and by treating them still as children.

Many people consider it too difficult to nurse older boys and girls in the same ward, but if absolute segregation is insisted on there should be some place where children of all ages and sexes can meet in easy and natural circumstances as soon as they are able to move around. When children are in hospital for long periods it is essential not to restrict their opportunities for social experience more than is absolutely necessary.

EMOTIONAL NEEDS OF THE CHILD

In considering the second part of the problem, one must try to imagine how an ill child feels on admission to hospital. Often he has been ill for quite a long time. He has missed school and feels insecure because he is losing ground there. He is feeling very unwell, often in pain, and he knows that his parents are anxious about him and their fear is communicated to him. He is going into a strange place among strange adults and children, and he is separated, perhaps for the first time in his life, from the people he loves and from the familiar home atmosphere. He is going to live in this new environment for many months and he is worried how he will get on. The first necessity is, therefore, that he should feel that there are people round him who will love and care for him, be kind, and understand him.

It is the job of the doctors and nurses to provide the necessary medical care; it is the job of the teachers in the special hospital schools to provide for education; but the emotional needs of the child are apt to be forgotten just because they are everyone's and no-one's particular concern.

It is very important, particularly with the younger children, that they should have at least one adult with whom they can feel really secure. With the present staffing difficulties this often remains only an ideal, for even the sisters change their posts very rapidly. A possible solution would be to divide the ward into families, a doctor, a sister or staff-nurse, and one or two junior nurses being specifically allocated to each small group of children. It seems to me that the feasibility of such a procedure should be determined by experiment. However, if for administrative reasons this cannot be arranged, each child should know that there is one adult who is specially interested in him and can give him emotional security throughout the whole of his illness.

Children should not be emotionally dependent on other children who may get well and go home. There have been too many cases where a child is making slower progress than his friend. The friend goes home and the child is left lost and lonely. He begins to worry about his own condition and very soon he has a relapse. On the other hand, I know of at least one case where a child, judged as hopelessly ill, was taken in hand by a doctor, who gave him unlimited affection and constant care, with the result that, after a few weeks, the child was bouncing round the bed looking the picture of health and enjoying himself heartily. Even if such improvement were only transitory, it would surely be worth attempting.

Very ill children are now generally placed in side wards, to give them extra quiet and for the convenience of the other children. But if this is done they should not be left too much alone, for it must be remembered how anxious and insecure a very ill child feels. Wherever possible it is advisable to have a special nurse, or else the mother, attending the child.

In trying to keep the children quiet and tidy, it is often forgotten that children need to play and that they can get rid of a lot of aggression by way of constructive games. It is not uncommon in hospital to see children lying back in bed, bored and miserable, without any toys or games available. This happens particularly where the child does not make friends easily; of course the staff are too busy to spend all day amusing him, even if this were desirable. Far too little imagination is used in moving beds around until the children are next to those they particularly like. I would even move an ill-adapted child into another ward in an attempt to find someone who was congenial to him there.

Many difficulties arise because the nurses are not taught the elements of developmental psychology and have no psychologist to whom they can go for advice. It is not suggested that nurses should be trained as psychiatrists, but they should be able to distinguish the grosser forms of abnormal behaviour. For instance, such problems as violent temper tantrums and stealing are often treated as ordinary naughtiness when they really require psychiatric attention. On the other hand, behaviour which is quite normal to children at certain stages of development often becomes a major problem just because it is not recognised as such—for instance, adolescents often oppose authority merely as a matter of principle in their struggle to achieve independence. Such young people are often helped by being given some measure of self-government within the ward, and by being allowed to assist with the very young children and babies.

As the children get better, their fears and worries about going home should be discussed with them. There may be many difficulties related to physical limitations, the return to school, or even fitting back into the family. The following incident may show how such problems are sometimes expressed.

A little girl, aged 9 years, who had acquired a baby bro while in hospital, remarked, "I am not sure I want to home. I don't know if I am loved any more. Ten mo is a long time to be away." A night or two later it observed that she had started to act a play, which she originated, with one or two other friends. The plot of play was that the mother of a family, in which there a new baby boy, engaged a girl as a maid-servant; this turned out to be an infanticide and killed the baby and she was then condemned to death. This play repeated every night for about ten days, the little girl pla the rôle of the mother. When she went home, she very pleased with the baby brother, and apparently ma good adjustment.

With adolescents, the problem of future occupa crops up. Advice should be given about the choic career with particular reference to the intellige abilities, and disabilities of the individual, as wel to his particular preferences. Where necessary, the and girls should be put in touch with agencies who help to find them jobs. It is often a good thing to a few talks on careers, indicating the kind of different jobs entail, what qualities they need, what prospects there are of promotion. Most chil are very ignorant about job possibilities at the they have to make their choice.

Finally, the closest coöperation should be mainta between the medical staff and the parents. The par should be encouraged, and if necessary helped, to their children as often as possible. They should alw be given the choice of remaining with their chil when they are acutely ill, and they should always seen before the child goes home, so that they k exactly how they should treat the child and can about any problems which are worrying them.

SUMMARY

The non-medical care of chronically ill childre discussed in two parts—(1) the organisation discipline of the ward, and (2) the emotional ne of the individual child.

It is recommended that the wards for such child should be considerably reduced in size, that discip should be orientated to understanding the needs of children rather than to keeping them quiet and ti and that punishment should only be used as a resort, after any particular situation has been thoroug investigated and all other means of explanation a persuasion have failed.

Nurses engaged in caring for chronically ill childr should have the *elements of developmental psycholog* included in their training curriculum.

Sick children need the constant support of a symp thetic adult throughout the whole course of their illne and every attempt should be made to place the ch among congenial companions.

The closest possible coöperation between staff a parents is essential at all stages of the illness and recove

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DISTRIBUTION OF GENERAL PRACTITIONERS

HE Medical Practices Committee has completed its ey of England and Wales and has assigned all utive-council areas or parts of them to one of schedules. two of which are given below.

chedule 1 contains the names of parts where. in the ion of the committee. more doctors are needed. Parts ed in schedule 2 are also completely open to any tor who wishes to start a practice. Admission to medical list of the executive council of places named both these schedules will be automatically granted. intending practitioners can proceed to make all ngements acting on this assumption.

chedule 3 lists areas which are "doubtful." Appliions to practise are likely to be granted, but information the hands of the committee may lead to the area ng closed. The establishment of a successful practice these areas is likely to be hazardous.

chedule 4 gives the name of the "closed areas" in ich the committee has decided that the number of tors providing general medical services is for the e being adequate. Such closure only gives the mittee the power to refuse an application to go on medical list (subject to the right of the applicant appeal to the Minister). To members of executive ncils and local medical committees, and to doctors, should convey no more than that the committee is likely to agree to an increase in the number of pracioners practising in the district and might agree with executive council to refuse to allow replacement of ractitioner who resigns. This does not mean. however. at a retiring practitioner could not be replaced. here an executive council in agreement with the local edical committee considered replacement desirable, the edical Practices Committee would agree. and, further, might suggest replacement in other instances where this peared desirable. Nor does closure mean that under other circumstances would the committee admit a actitioner to the list; personal factors advanced by e applicant, the executive council. the local medical mmittee, or others interested might cause the applicaon to be granted.

SCHEDULE 1

From the information furnished from the executive uncils. it would appear that the number of practitioners ailable in the densely populated parts of the following stricts is insufficient for local needs. For more precise tails application should be made to the local executive uncil.

COUNTIES

Bedfordshire.—Luton.

Cheshire.—Crewe and Nantwich. Hyde, Dukinfield and Stalybridge, ncorn and Stockton Heath, Newferry and Bebington.

Cumberland.—Cockermouth, Maryport.

Derbyshire.—Chesterfield B. and R.D.; Ilkeston B.: Alfreton, lsover, Claycross, Heanor, Long Eaton, Matlock, Ripley, Staveley, adlincote U.D.s; Blackwell, Clowne R.D.s.

Durham.—Felling U.D., Hebburn U.D.. Jarrow B. and Boldon D., Houghton-le-Spring, Hetton and Washington U.D.s. Chester-Street U. and R.D.. Stanley U.D.. Consett U.D. and Lanchester D., Crook and Willington U.D. and Tow Law U.D., Bishop ckland. Shildon and Spennymoor U.D.s. Easington R.D., dgefield R.D., Stockton U. and R.D.s and Billingham U.D.

Gloucester.—Kingswood.

Hampshire.—Aldershot, Eastleigh.

Hertfordshire.—Ware U.D. and Cheshunt.

Huntingdonshire.—Ramsey.

Isle of Ely.—March, Wisbech. Whittlesey.

Kent and Canterbury.—Chatham. Dartford. Erith, Gravesend, chester B.s; Crayford, Northfleet, Sittingbourne and Milton. anscombe U.D.s; Dartford R.D.

Lancashire.—Aintree, Bacup, Barrowford. Coppull. Croston, arnworth. Haydock, Heywood, Hindley. Huyton with Roby, lam. Kearsley. Leigh, Litherland. Middleton, Newton-le-Willows, escot, West Houghton. Widnes. Worsley.

Leicestershire and Rutland.—Ashby de la Zouch, Coalville, Hinck-y. Melton Mowbray (excluding Somerby).

Lincolnshire (Holland).—Spalding U. and R.D.s.

Lincolnshire (Kesteven).—Grantham.

Lincolnshire (Lindsey).—Louth.

London.—Battersea, Bethnal Green, Hammersmith B.s.

Middlesex.—Edmonton. Heston and Isleworth, Southall. Wood Green B.s; Feltham, Hayes and Harlington, Staines U.D.s.

Norfolk.—Mitford and Launditch.

Northampton.—Kettering.

Northumberland.—Ashington, Bedlington, Haltwhistle, Wallsend.

Nottingham County and City.—Arnold. Bawtry, Beeston, Carlton and Netherfield, Clipstone. Eastwood, Hucknall. Kimberley, Langold. Stapleford. Warsop, Worksop. City of Nottingham.

Soke of Peterborough.—Peterborough, Whittlesey, Market Deeping.

Somerset.—Chew Magna. Street.

Staffordshire.—Newcastle-under-Lyme B. and R.D.; Wednesbury. Bilston, Rowley Regis. Tipton B.s; Kidsgrove. Biddulph. Aldridge. Brownhills. Rugeley. Darlaston, Willenhall, Wednesfield, Sedgley. Brierley Hill. Amblecote U.D.s; Lichfield R.D.

Surrey.—Mitcham B.; Chertsey, Walton and Weybridge U.D.s.

Sussex (West).—Lancing.

Warwickshire.—Bedworth, Nuneaton. Warwick U.D.s; Atherstone R.D.

Wiltshire.—Swindon.

Worcestershire.—Bromsgrove. Halesowen, Oldbury. Stourbridge.

Yorkshire (East Riding).—Haltemprice district, Hedon district. Howden and Goole.

Yorkshire (North Riding).—Carlin How, Dormanstown, Grangetown, Guisborough.

Yorkshire (West Riding).—Castleford and Normanton U.D.s, Featherstone U.D.. Knottingley U.D., Pontefract B., Osgoldcross R.D., Horbury U.D.. Ossett B.. Wakefield R.D.. Batley B.. Heckmondwike U.D., Hoyland Nether U.D., Stocksbridge U.D., Wortley R.D.. Penistone U. and R.D.s, Hemsworth U. and R. D.s. Cudworth U.D.. Darton U.D., Royston U.D.. Darfield. Wombwell, Worsborough. Dodworth U.D.s; Swinton, Rawmarsh, Wath-on-Dearne U.D.s; Adwick-le-Street U.D., [illegible] U.D.s. Rotherham R.D., Doncaster R.D., [illegible] R.D., Conisborough, Mexborough. Dearne U.D.s; Maltby U.D., Kiveton Park R.D.

Denbighshire and Flintshire.—Buckley. Caergwrle. Connah's Quay, Hawarden. Holywell and Wrexham R.D.

Glamorganshire.—Aberdare. Bridgend. Caerphilly. Gelligaer. Llwchwr. Maesteg. Mountain Ash, Neath, Penybont, Pontypridd Port Talbot. Rhondda.

Monmouthshire and Newport.—Abercarn. Bedwas and Machen. Bedwellty, Cwmbran, Ebbw Vale, Pontypool, Risca and Tredegar.

COUNTY BOROUGHS

All of the larger cities in the country have densely populated districts, where the services of additional doctors are required. In addition more doctors are required in the following county borough areas:

Barnsley
Birkenhead
Bootle
Burton-on-Trent
Carlisle
Coventry
Derby
Dudley
East Ham
Gateshead
Great Yarmouth
Leicester
Middlesbrough
Northampton
Norwich
Rotherham
St. Helens
Smethwick
South Shields
Stoke-on-Trent
Sunderland
Tynemouth
Wakefield
Walsall
Warrington
West Bromwich
West Hartlepool
Wolverhampton

SCHEDULE 4

The committee declares the number of doctors included in medical lists and practising in the following areas to be adequate:

COUNTIES

Berkshire.—Lambourn (Hungerford R.D.), Brightwalton (Wantage U. and R.D.s).

Buckinghamshire.—Great Missenden, Prestwood, Chalfont St. Peters, Chalfont St. Giles, Gerrards Cross. Beaconsfield, Seer Green, Stokenchurch. Brill. Long Crendon. Haddenham.

Cheshire.—Hoylake and West Kirby district. Knutsford and Wilmslow (with the exception of Lymm), Bollington (Macclesfield District), Helsby (Runcorn district).

Cornwall.—St. Agnes, St. Ives and Carbis Bay, Hayle, Townshend and Fowey, Tywardreath and Marazion, Mullion, Lizard, St. Keverns, Falmouth, Perranarworthal, St. Mawes, Ruanhighlanes, Bude, Widemouth Bay, Rock, Wadebridge. Tintagel, Boscastle, St. Germans, Downderry, Millbrook, Cawsand, Upton Cross and Pensilva. Constantine, Padstow, Torpoint, Mevagissey.

Cumberland.—Alston. Bootle and Millom. Ravenglass and Gosforth. Caldbeck and Dalston, High Hesketh district, Keswick. Kirkoswald. Rowrah.

Derbyshire.—Buxton B., Bakewell U. and R.D.s, Whaleybridge U.D.

Devon and Exeter.—Yelverton, Lifton, Ottery St. Mary. Holsworthy, Lynton and Lynmouth, Pinhoe. Bradworthy, Hartland, Churchinford. Clayhidon, Culmstock. Shebbear, Beer, Seaton, Colyton, Braunton. Woolacombe, Croyde Bay. Georgeham, Ilfracombe, Shaldon, Chulmleigh, Hatherleigh, Winkleigh, Dunsford and Umberleigh, North Tawton. Sticklepath and Witheridge, Sidmouth and Sidbury. Hope Cove. Lustleigh and Bovey Tracey, Moretonhampstead. Newton Ferrers. Yealmpton. Modbury. South Brent, Buckfastleigh, Salcombe. Brixham. Paignton, Totnes, Ashburton, Kingskerswell. Teignmouth. Dawlish. Starcross. Chudleigh and Exmouth, Lympstone, Woodbury. Morchard Bishop, Charlton Fitzpaine, Bishopsteignton, Black Torrington, Bow, Brandninch. Budleigh Salterton, Tipton St. John. Chillington, Uffculme.

Dorset.—Abbotsbury and district, Bourton and Gillingham, Branksome. Broadstone. Buckland Newton and Cerne Abbas, Canford Cliffs, Charmouth and Lyme Regis, Child Okeford, Corfe Castle and district, Cranborne, Dorchester, Evershot, Ferndown, West Moors and Kinson. Handley and district, Maiden Newton, Marnhull and district. Milton Abbas, Winterbourne Stickland and districts, Puddletown. Shaftesbury and district, Stalbridge, Sturminster Newton. Swanage, Yetminster.

Durham.—Stillington.

Gloucestershire county and city.—Bishops Cleeve, Blockley, Moreton-in-Marsh, Chipping Campden, Mickleton, Charlton Kings.

Cheltenham, Cleeve Hill, Prestbury, Fairford, Lechlade, Minchinhr [illegible]

[illegible] Fleet.

[illegible] Kington, Hay-on-Wye, Staunton-on-W.

Hertfordshire.—Braughing R.D.

Huntingdonshire.—Alconbury Weston, Buckden.

Isle of Ely.—Manea.

Isles of Scilly.

Kent and Canterbury.—Lydd, Tunbridge Wells, Sandwich B.s; Broadstairs and St. Peters, Herne Bay, Sevenoaks, Southborough U.D.s; *Ashford (East), Ashford (West), Cranbrook* and Tenterden, Romney Marsh and Sevenoaks R.D.s.

Lancashire.—Allithwaite and Grange-over-Sands, Broughton West and Kirkby Ireleth, Coniston, Hambleton, Preesal, Pilling and Stalmine with Stainhall, Haverthwaite, Hawkshead, Lytham St. Annes.

Leicestershire and Rutland.—Peatling Magna, Hallaton, Somerby, Uppingham, Market Overton.

Lincolnshire (Kesteven).—Bassingham, Billinghay, Castle Bytham, [illegible] Folkingham, Martin, Metheringham, [illegible] nards, Coningsby, [illegible] Mary), Fulstow, Hogsthorpe, Imminghan [illegible] Mareham-le-Fen, Market Rasen, Newton-o [illegible] Revesby Bridge, Saltfleetby (All Saints), Sutton-on-Sea, Tetford, Tetney, Theddlethorpe (All Saints), Toft Newton, Woodhall Spa.

Middlesex.—Finchley B.

Norfolk.—Freebridge Lynn, Diss, New Hunstanton, Wells.

[illegible] Flore, [illegible] edon, [illegible]

Nottinghamshire county and city.—Carlton-on-Trent, North and South Collingham, Colston Bassett, North Leverton, Tuxford.

Oxfordshire county and city.—Bampton, Bloxham, Burford, Chinnor, Clifton Hampden, Cropredy and Thame.

Shropshire.—Clun.

Somersetshire.— [illegible] be Down, Dulverton, Dunster, Ilminst [illegible] gport, Milborne Port, Minehead and P [illegible] Wellington, Weston Zoyland, Williton [illegible]

[illegible] (Seisdon R.D.).

[illegible] Alderton, Earl Soham, Peasenhall [illegible] nd, *Southwold, Wangford, Wrentham* [illegible]

[illegible] D.s; Banstead, Coulsdon and [illegible] erhead U.D.s.

[illegible] Cuckfield U. and R.D.s, Bexhill, [illegible] attle, Hailsham, Uckfield R.D.s.

Sussex (West).—Barnham, Eastergate and Yapton, Cowfold, Haslemere (area adjoining Surrey border), Selsey, Storrington, Worthing district.

Warwickshire.—Bideford-on-Avon, Hampton-in-Arden, Meriden R.D., Marton, Southam R.D. (with the exception of Southam and adjacent parishes), Stratford on Avon R.D.

Westmorland.—Ambleside, Milnthorpe, Burton, Arnside and Kirkby Lonsdale, Bowness, Windermere and Staveley, Grasmere, Glenridding, Kirkby Stephen, Kendal.

Wiltshire.—Aldbourne, Bradford-on-Avon, Broadchalke, Castle Combe, Great Bedwyn, Littleton Panell, Mere, Sherston, Sutton Be [illegible] ge, Codford St. Mary, Fovant, Hindon; Mc [illegible] Shrewton, Tisbury.

[illegible] House district, Malvern district.

[illegible] -Hornsea, Bubwith, Elvington, Escrick, Holme-on-Spalding Moor, Leven, Middleton-on-the-Wolds, Rillington, Roos, Stamford Bridge.

Yorkshire (North Riding).—Aldbro St. John, Ampleforth, Aysgarth, Coxwold, Danby, Easingwold, Tollerton, Hawes, Helmsley, Grosmont, Hutton Rudry, *Stokesley and Great Ayton*, Kirby Moorside, Kirklington, Knayton, Leyburn, Newsham, Reeth, Thornton-le-Dale, Topcliffe, Welburn.

Yorkshire (West Riding).—Harrogate.

Anglesey.—Beaumaris B., Llangefni and Menai Bridge U.D.s, Llanfairpwll and Bodorgan (Aethwy R.D.), Twrcelyn R.D.s (with the exception of Cemaes Bay) and Valley R.D.

Breconshire.—Llanwrtyd.

[illegible] gan, Crosswood, Henllan, [illegible] Llangadock, Llanybyther, [illegible] Bettwsycoed, Conway, Criccieth, [illegible] ama [illegible] (ar [illegible] (ar [illegible] Llanelian-yn-Rhos), Old Colwyn and Rhos-on- [illegible] adjacent areas of Pontfadog and Llanarmon [illegible] Bettws, G.G.).

[illegible] (Cardiff R.D.), Cowbridge Municipal and [illegible] clawdd (*Gower R.D.*), *Porthcawl* U.D.

[illegible] Barmouth, Corris, Towyn and Aber- [illegible]

[illegible] rt.—Caerleon, Tintern (Chepstow R.D.),

[illegible] Maenclochog, Newport, St. *David's*, [illegible]

Radnorshire.

COUNTY BOROUGHS

Bournemouth Hastings Southport

B., borough. U.D., urban district. R.D., rural district.

Reconstruction

COSTING FOR HOSPITALS

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THE Select Committee on Estimates[1] recom. that "A uniform system of costing should be de as soon as practicable for the Hospital Servic England and Wales." What is meant by cost What are the objects and advantages of costin relation to hospital finance and accounting?

It is difficult to give an accurate and comprehe definition of costing. It may, for want of a bette described as a systematic record of the detailed tra tions relating to the various activities of a hos with a view to arriving at the total expenditure unit cost in respect of each ward, department, acti &c. Contrasted with financial accounts, cost acco endeavour to arrive at these figures by a *proces* detailed analysis, showing as it were a series of s income and expenditure accounts. The financial acco endeavour to arrive at the same total by the metho grouping the items of income and expenditure.

WHY COST ACCOUNTS?

The objects of cost accounts for hospitals may be st *briefly as follows:*

1. To provide the managing authority with knowledg the working or running expenses and costs of wards, de ments, functions, and activities, *with a view to (a) ob* and maintaining control over financial transactions, (*b*) increasing the efficiency of the administration.
2. To find out the elements of the working expenses a view to detecting waste of material, loss of time, an on, and to securing, where necessary, a planned reductio expenditure.
3. To ascertain that the proper relationship exists betw the expenses incurred and the services obtained in res of each activity.
4. To serve as a guide in the preparation of annual other budgets on a unit or departmental basis, and to en future policies to be founded on reliable information of work and *the cost of each unit or department.*
5. To record promptly the facts and tendencies of all activities with a view to enabling the maximum numbe patients to be treated for the least expenditure of mate labour, and time.
6. To show the cost of the staff as distinct from the of patients.
7. *To show the cost of special services as distinct* fr general services.

Among the particular advantages are these:

(*a*) With complete and accurate costs of maintaining e *activity, the apportionment* of expenditure between various classes of patients treated, and more particula between inpatients and outpatients, may be made on m reliable data than are available under existing arrangeme

(*b*) Cost accounts will show the nature and extent of *specialised treatments available. A* wide range of differen exist in this connexion, but under the existing arrangeme these cannot be allowed for in calculating the cost per b

Cost accounts combine the advantages of both t subjective and objective methods of accounting, t expenditure first being allocated to objects (war departments, *or activities) and then* to subjects (natu of expenditure) within the objects. They show also t extent to which each ward or department has be *called upon by others, and the* cost of the servic rendered to these latter departments. Each departme therefore charged with the expenditure it incurs, h direct and indirect ; and as the various departments subject to separate control responsibility for increases d decreases is more readily traced and brought to notice of those primarily responsible. The responsi- ity for the economical purchase of supplies will be th the supplying departments, and the responsibility the cost of consumption of supplies will lie, as it doubtedly should, with those who requisition and use em.

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[1] Seventh Report from the Select Committee on Estimate Session 1948–49. *The Administration* of the National Hea Service. H.M. Stationery Office. 1949. See *Lancet*, 19 i, 1065.

Motives of economy are thereby made considerably onger. Further, the divisions into which the expen- ture is resolved throw into relief the separate services cidental to the activities carried on, and the whole the expenditure falling into each of these divisions is some extent correlated. A change in the organisation scope of any one of the services is thus reflected ly in the expenditure and unit cost of that service d has no effect upon the results shown by the other rvices. Hence from the viewpoint of control its precise fect upon the finances of the hospital is clearly bservable.

Again, with the aid of cost accounts it is possible to scertain the differences which arise from varying con- itions, and, by an intelligent study of the constituent lements of cost in each case, to consider methods by hich, without in any way impairing efficiency or limiting he number of patients treated, economies may be ffected.

These arguments in favour of the costing system now ecommended by the Select Committee on Estimates ll have some weight, though this varies in different ases. All of them together, however, are less important han certain indefinable, but nevertheless very real, dvantages resulting from a system of accounts which oncerns itself with matters of real interest to a keen nanagement and which leaves non-essentials alone. The lifference between a management which is kept con- inuously and well informed, and one which is uninformed, r half-informed, can no more be covered by specific oints than the benefits of a good education can be overed by giving isolated examples of its practical use. The steady flow of relevant and reliable data through he minds of the management cannot fail to generate n understanding and enlightened comprehension which will work itself out in sound policies that would otherwise e much less likely to materialise.

PRESENT DEFICIENCIES

A statement of the objects and advantages of cost accounts largely reveals the deficiencies and limitations of the present system from the viewpoint of administrative control. Any hospital recording system concerning financial and administrative activity is not productive, nor does it fulfil its potentiality for good, unless it furnishes the basis for an analysis of results which may be used by the management for purposes of control.

The present system of financial accounts throws very little light, from a practical standpoint, upon the causes which have produced the result it shows. A hospital comprises a large number of departments and activities, in which the conditions are fundamentally different; but the records do not show the expenditure incurred by each, and so it is not possible to judge the comparative economy of these various departments. The total cost of treating a patient in each of two wards in a hospital may be identical, but the items making up this cost in each case may vary to a remarkable degree.

Another serious deficiency of the present system is that the natural division of overhead expenditure is not shown. For example, the heating service comprises wages of engineer and boilermen and the price of fuel, water, and supplies of oil and other materials necessary for its maintenance. In order to ascertain the separate cost of this service—and it is essential that this cost should be known—all expenditure, whether direct or indirect, that is incurred upon the service has to be brought together into one account. At present, the expenditure on heating is diffused throughout the accounts—e.g., wages (under salaries and wages, other officers and employees); fuel (under fuel, light, and power); water (under the heading for water consumed throughout the hospital); and materials for repairs (under maintenance of buildings, plant, and grounds). Expressed in this way the statement of expenditure on the individual items has no real significance; for the items cannot be considered in relation to any service whereby their efficiency per se and their efficient use can be measured.

It has been said that hospital expenditure depends on hospital policy. This is a dangerous half-truth; the policy may be quite sound, but the administration by which it is carried out may be inefficient and extravagant to a degree. The form of accounts in use should be such as will bring the facts to light and so enable criticism to be usefully applied.

Disabilities

35. SUBARACHNOID HÆMORRHAGE

WHEN I woke on the morning of Dec. 30, 1939, I rolled over in my camp bed and stretched vigorously. After many civilian years I had been back in the Navy since August, my boss was my oldest friend, I was doing a job never done before by any Naval officer, so despite my ignorance I could hold my own with the crustiest captain, and I was thoroughly enjoying myself. I was 39 and very fit. There had been 20° of frost that night on the top of the hill behind Chatham, and the boards of the unheated Army hut kept out the blast only where they joined. As I moved I felt an ache and cursed the hut for landing me with a stiff neck. But the ache soon developed into a pain, then quickly into a blinding headache and I realised that something odd had happened. I had just enough time to fling on some clothes and stagger 15 yards to the operations room before I collapsed. The duty corporal, dutifully alarmed, rang the R.N. hospital and I was laid out to wait. The pain was now intense; I shivered violently. At last the ambulance came; the young R.N.V.R. doctor found it difficult to write down my particulars, for by now I was barely conscious and certainly not clear-headed. I cared little who was my next-of-kin, what my age, or where I lived. I do not remember arriving at the hospital, and little of the first day except great waves of pain, mercifully relieved by coma; the surgeon commander could not have had much help from me in making the diagnosis: if I answered any questions I could not have been coherent. Nor can I remember the first lumbar puncture. I had it at 6 P.M., and the cerebrospinal fluid confirmed the diagnosis at once. From the second day I would beg for more, and for morphia. Each puncture brought inexpressible and immediate relief, but after a few hours the pressure rose, and the pain returned. My eyes could bear no light, and there was a red haze round everything. In all I had five lumbar punctures—on the first, second, third, fifth, and seventh days. My later memory put the number well into double figures, but this may have been suggested by the enormous scab which came off in my first real bath.

In spite of all this I had no idea that I was seriously ill. Not until a visitor assured me that I *would* get better did it occur to me that I might not. Even then I never thought of it again.

* * *

It must have been during these early days that my dreams began. Hallucinations might be a better word, for they were so vivid that I could not distinguish them from reality until they had stopped. Although I was not aware of it, the war must have been on my mind: it came into every dream. I remember them all except the first, which, I was told later, I related at the time to the consulting neurologist—though I do not remember that either. It was about naval officers riding fish, perhaps an unconscious forecast of the "frog-men" of 1945. Another one distressed me intensely because some important plans, which only I could deal with, were missing. The clever chief sick berth steward gave me a large piece of paper, saying all the right things, and I was pacified. Once I was one of a party inspecting gun-sites in Sussex. It consisted of the gunnery commander (my friend in real life) and the King himself (I had served with him in the first war). We went to Rye (where I had lived 20 years before) and in the hotel I broke up the party by having a subarachnoid hæmorrhage. The King was most concerned and very kind. Another dream put me at the back of a room in which was a huge, brilliantly lit glass tank with several corpses in R.N. uniform swaying to and fro through the water. Unaware of my presence, some men—dark sinister shapes against the lighted tank—were watching this intently. I knew them to be enemy agents and slipped away to report.

The most exciting dream was thoroughly mixed up with reality. Once again the enemy was up to some deadly stratagem and had to be foiled at all costs. I started to get out of bed. Two raw young stewards had been set to watch me at night and they made the mistake of using force. As will be seen later, I responded only to cajolery. Held down on my back, I hit up at one of them and my knuckle split his lip and crushed his nose. It must have hurt. He let go and I turned on the other, who did not wait, but fled. First blood to me: in my dream they were in league with the enemy. I was out of the room in a flash and into the bathroom which I barricaded. The alarm had now been given and more stewards were sent for. My dream told me, then or later, that I must go to a certain barber's shop where I should find some men in white coats pretending to cut hair, though they were in reality dangerous spies. So I came out, to be confronted by four white-clad men. The battle began. It was not a fair fight, although four healthy men were against one very sick one, because I was filled with an astonishing strength and hit very hard, whereas they could only grapple. One by one they fell, or withdrew, leaving me gasping for breath but a victor, at my feet the bodies of the slain. I remember a feeling of triumph at having narrowly averted a disaster. The night sister came along now. I liked her, for she was sweet and kind and I knew her instantly: enemy agents were invariably swarthy, squat, and hideous. For all she knew I destined her as my fifth victim, but she put her arm round me and said "Come to bed now, there's a good boy"; and I went like a lamb.

That was the last dream. Lumbar punctures went on, with blessed relief. The headaches became less intense and less frequent: at night they were dispelled by 'Veganin' and tea. On about the tenth day I came off the danger list and on the fourteenth began to get up. After 3 weeks I was transferred, shaky and tired, to another Naval hospital, where I was admitted to the "bin." This may have been a clerical error, for after a few days I was offered a transfer to the medical ward; but by then I was finding the company so agreeable that I refused it. My reflexes were tapped or scratched—they were all over the place—and one psychiatrist put me through an appallingly stiff test of mental arithmetic in which I astonished myself by making no mistake. There was little wrong with my wits. I felt no worse than anyone who has been seriously ill—just ca tired and with poor appetite; but progress was stead

After 3 weeks there I went to Brooksby Hall w had been turned over by its owner for use as a Na convalescent home. We had Lord Beatty's cook butler; I had his bed. We were looked after by l lovelies, one of whom played and sang like an A pub within easy and pleasant walking distance delicious cherry brandy. I was sorry when I was gi three months' sick leave.

My strength increased and I started a wangle to my job back. It would have succeeded but for w was later described as an anatomical accident. afternoon in a cinema I began to feel uncomfortabl my buttocks and down the left leg. I could not sit When we came out I kept stumbling, and as I wal home my left foot seemed to be out of control. T night was bad. I could neither sit, lie, nor stand without a maddening discomfort. There was no p So, although I knew it would seal my doom, a call w out to the R.N. Hospital, Chatham.

My old friends, the surgeon commander, the c steward, and, to my delight, the night sister, now day duty, formed the reception committee on landing. My room was blacked out and the appara for a lumbar puncture was on the trolley. They expec trouble and were ready for it. I mumbled rat thickly that this was something quite different, but needle went in just to make sure. It acquitted me, blinds went up, and perhaps the stewards, rubbing th jaws, breathed again. It was soon decided that a sm clot had broken away from the scab inside my head had *floated along in the blood-stream until it entere* small vessel and jammed, causing hemiplegia with effect of a mild left-sided stroke. My face was immo on *that side, my speech blurred, and I could use my* hand with difficulty. There was no treatment, exc that for a week I was given a sedative every 4 ho through the day and knock-out drops at night. La on my private doctor, hearing what I had been havi said "Good God, that's not a sedative, it's an an thetic." I hardly ever woke. A heavy A.A. batt nearby would sometimes open fire, but I often slept At the end of the week I was taken before the surg captain with the result I expected. A nice touch in congé was the warning that if I stayed in the hospital af the date of my invaliding, it would cost me 12*s.* 6*d.* a d

Inactivity at home through the days of Dunkirk w almost unbearable. Strength came but the paraly remained. My speech recovered first, then the han but my foot dragged badly and even worse when I w tired. My face remained very stiff; I stopped smilin even when there was anything to smile at. Anoth symptom was a loss of emotional control. Not that flew into rages or burst into tears, but if I read somethi moving, or in a theatre saw a particularly movi scene, I could barely control myself: tears would co to my eyes, and my stomach would shake. Life beca intolerable with nothing to do. My civilian employe denuded of staff, took me back in June, six mont after the hæmorrhage. It was pure charity, for at fi I was useless. Two hours from door to door—five af one air-raid—was too much. I was desperately ti every night, my foot dragged, and only complete rest weekends kept me going. After six months or so began to pick up, and by the end of another year I co hold my own. I had been told that there was no answ to my errant blood-clot and that I should have to w for other vessels to take over the functions of the clogg one. Perhaps this was now beginning.

My 100% pension was reduced in the third year a again every year until the seventh, when I was given £ and told to go away. I could hardly complain, for then I was as fit as the next slightly unfit man, and r ly loss was the constantly recurring cost of repairs to left shoe. But "final settlement" was perturbing. hat," I asked, "if I get another hæmorrhage?" ey said that if I did, it would have been caused by events of 5 minutes, 1 minute, or even 10 seconds t, but not those of 1939.

o this day my control of the left foot is not perfect l my face is a little wooden. When very tired my leg sometimes tingles and twitches, especially in bed. t I take no precautions. I work hard, sometimes very d; by inclination I play no games, but I can walk day at my own pace. I sometimes carry heavy tcases; not long ago I decorated my flat, which found the weak spots in my shoulders and back. I can sit late and take a party with the next man—in short, ave written off all my troubles. But it sometimes es me to think that this dangerous and painful illness s as nothing, in its consequences, compared with the tuitous sequel, which was neither dangerous nor painful.

Public Health

Poliomyelitis

NOTIFICATIONS in the week ended July 16 were: poliomyelitis (73), polioencephalitis 5 (4), figures for the previous ek being in parentheses. Thus the rise in incidence which was nporarily arrested last week has set in again. Cases were dely distributed, but except for 2 in the Wigton district of mberland there were none north of the West Riding. ly one case was reported in the eastern counties. Multiple es (poliomyelitis and polioencephalitis together) were orted from: London 13 (6), Berkshire 2 (0), Cheshire 3 (2), rnwall 4 (5), Cumberland 2 (0), Devon 9 (11), Essex 3 (1), oucester 6 (3), Hertford 2 (4), Lancaster 7 (5), Leicester (1), Middlesex 11 (5), Southampton 14 (2), Surrey 4 (1), ssex 2 (1), Warwick 2 (3), Yorkshire, West Riding 19 (10), amorgan 4 (3).

The rise this year closely parallels that of July, 1947, en an "unprecedented prevalence" was forecast; once ain an unusually high incidence is to be expected, though ere is a definite possibility that the curve will flatten out. p to now the large centres of population have not been iously involved.

Poliomyelitis Film.—A 60-minute film, "Polio: Diagnosis d Management," produced by the Crown Film Unit in 1948 r the Ministry of Health and suitable for general-practi- oner audiences and nursing, physiotherapist, and public- alth staffs, is obtainable on 35 and 16 mm. on loan om the Central Film Library, Imperial Institute, South ensington, if the organiser has his own projector; otherwise can be shown on the Central Office of Information Mobile lm Units to professional audiences who can provide properly blacked-out hall, by application to the Regional lm Officer of the C.O.I.

Tonsillectomy.—In the memorandum on poliomyelitis medical officers of the Ministry of Health (*Lancet*, 1947, 155) the following statement was made: "There is, wever, overwhelming evidence that a recent tonsillectomy creases the risk of a child contracting poliomyelitis, parti- larly of the bulbar type. Prevalence of poliomyelitis in an ea should therefore be an indication for the postponement operations on the nose and throat whenever possible." e evidence was summarised by Glover (*Mon. Bull. Min. lth*, 1948, 7, 150). Surgeons should clearly take the local evalence of poliomyelitis into account when considering e desirability of operating on a particular child.

The June Quarter

The fall in the stillbirth and infant-mortality rates in ngland and Wales continued during the second quarter of is year. The stillbirth-rate (22·7 per 1000 total live and ll births) was the lowest ever recorded for a June quarter, nd equals the low record for any quarter set up in the eptember quarter last year. The infant-mortality rate of 0 per 1000 related live births was also the lowest ever recorded r a June quarter; it has been bettered only once—in the eptember quarter last year, when the rate was 28. The ve-birth rate was 17·7 per 1000 total population compared ith 21·9 and 18·8 in the second quarters of 1947 and 1948. he death-rate was 11·1 per 1000 total population: in the une quarter of last year it was 10·2, a record for the quarter.

In England Now

A Running Commentary by Peripatetic Correspondents

I SPRING to the defence of my unknown colleague in general practice who was metaphorically torn to ribbons by the local postmistress (see I.E.N. of July 23, p. 170). Does not this story exactly illustrate one of the most unsatisfactory features of the N.H.S.? When I was a boy and got a bit of grit in my eye it would never have occurred to me to take it to the doctor except in the last resort. I can remember numerous F.B.'s removed without difficulty by members of my family, by other boys, by schoolmasters, or, on one occasion, by a railway porter. The postmistress's F.B., admittedly a large one, could have presented no particular difficulty because the district nurse was able to remove it. Why then did the patient not go to the district nurse in the first place? More and more does a neurotic and "health-conscious" generation fly to the doctor about less and less.

* * *

Making out my weekly drug order under the N.H.S. gives me hours of happiness. In the past it was a humdrum affair. One merely listed in the order-book what was needed, adding the magic letters *N.(W.)F.* to the various liquores and misturæ pro infantibus, or the maker's name to the more recondite proprietaries, and the thing was done. Twenty minutes or less sufficed for it without putting any strain on the frontal lobes. I should mention that the job falls to me as medical officer of a small hospital without pharmacist.

Things are altogether different now. The head must be clear as well as the desk; the wits as sharp as the pencil. Here is work for a superior intellect. There are now not one but six order-books, and handsome big volumes they are, iridescent with their brightly coloured pages. The sky-blue one is for tablets and ampoules, and woe betide me if I enter any of these in the primrose book reserved for capsules, pastilles, pills, suppositories, and pessaries. Thoughts of homologous serum jaundice must not induce me to insert sera and vaccines on the deep yellow page less appropriately allocated to plasters and dressings, and to misdirect a proprietary article from its pink preserve to the white list of drugs, chemicals, galenicals, and gases is to court a charge of infamous conduct. Such are the hazards of a fascinating game.

It seemed a good opening move to enter in the white book the mists, pulvs, and ungs I had been accustomed to order, but that is promptly vetoed by Rule 10, which states that formulæ must not be written in the Purchase Order, but sent in as a Separate Statement so that "at a later date steps will be taken to ensure insertion in the Catalogue and the allocation of a Code Number and Unit of Quantity." The catalogue referred to is, like the order-books, in six bulky parts and is on the loose-leaf system—that is to say, the pages are clipped together now but will soon be all over the place as one hunts through them for the necessary clues. Of these pride of place goes to the Code Number, without which nothing can be ordered. Each number runs to seven figures, indicating that the sum of all articles obtainable already reaches millions, and no doubt it is going to soar steadily towards the billion mark as more and more code numbers are allocated.

By comparison, the insertion of the code number of the hospital on the pages of every order (Rule 8) is simplicity itself. There are but six figures here, showing clearly that the hospitals, dispensaries, &c., in this region are to be counted only in hundreds of thousands. This highly organised numerical system should at once make redundant the names of individual hospitals, many of which are either pompous or disagreeable anyhow. It should puzzle the enemy too in the event of war.

Another essential clue to be sought for is the Unit of Quantity. Let us see how it applies in the case of that very humble but necessary article, the cork, a few dozen of which in different sizes used to satisfy the needs of all my bottles over a long period. A chase often sidetracked on a false trail at length runs them to earth in part 6 of the catalogue, page 104, where the code numbers lend the poor things rank and dignity equal to that of the proudest mega of penicillin. Rule 5 (e) puts an end once and for all to the slipshod method of ordering a bag of mixed corks. Each of 11 sizes must now be ordered by unit of quantity, in this case a gross, so that to have some of each size means accepting over 1500 corks, most of which I am never likely to use. Then there is the matter of cost. For corks ordinary it is inconsiderable, but were I to require half a dozen corks red rubber I should be supplied with the inevitable gross at a charge of £1 2s. 6*d*. The column of charges is of course just a highly amusing abstraction in a health service wherein nothing is to cost anybody anything any more. Moreover a further stocking up of this item can be deferred until the summer of 1999.

Yes, the ordering of drugs, &c., has become a stimulating and thought-provoking exercise. To do it full justice I have set aside the whole of each Monday, and I hope the powers that be will devise other diverting tasks for other days of the week. It is really time our patients were told kindly but firmly that they can no longer expect the medical staff to devote more than one day in seven to their petty complaints, otherwise the essential business of the hospital must suffer.

* * *

The charming note on reflection and reminiscence by *my fellow peripatetic of July 9 and* Dr. Kennish's letter on hospital food in the same issue reminded me of an incident of my youth when we residents took more radical steps than merely to leave the dining-room.

We—and the nurses too—had fruitlessly and long protested over the appalling cooking to which we were subjected. On the eve of one hospital managers' meeting it was particularly revolting, so bad indeed that we sent the porter out for five fish suppers and a ewer of beer at a cost of 7*s*. 11*d*. The so-called Irish stew and the tapioca pudding we wrapped in several thicknesses of newspaper. Next day the senior resident waited on the managers' pleasure and, explaining the circumstances, presented the bill for 7*s*. 11*d*., requesting immediate reimbursement. When the storm subsided he apologised for the necessity of demonstration and unwrapped his two parcels in the middle of the committee table. Their overnight stay had not improved the appearance of these loathsome messes. The managers took this as a personal insult and intimated that he was dismissed. The senior resident thereupon threw open the door and dramatically pointed to two (empty) suitcases on the mat. "Gentlemen," he cried, with anger which he had no need to simulate, "all our bags are packed and we will see that the story of this is properly publicised among the graduates!" Capitulation was complete, and the cook was sacked forthwith. The nurses threw us a party to mark her passing. It was a *very* good night.

I am not advocating direct action, I merely record this incident to demonstrate the extreme lengths to which malnourishment may drive serious young men even at the critical start of their careers. That we were all Scots may have had something to do with it, for it is notable that your correspondent criticises the eating habits of the *English*.

* * *

It was about noon when I—the weary wife of a wearier G.P.—came round from the anæsthetic. It had been an acute appendix, with the usual distressing symptoms and a dawn rush by ambulance. Several pillars of the practice had broken through the cordon of nurses and were sitting about commiserating. Lacking imagination they did not realise that so soon after a surgical assault the patient's whole world is an aching and flatulent tum. The Vicar was different. He made witty cracks about tombstone inscriptions of the late century and left me amused and comforted. The pillars were solid, as one would expect, and as I lay there it seemed to me that the only thing that would shake them would be if my gaseous body rose gently from the bed and hovered at ceiling level while anxious nurses stood below with flatus tubes. I kept a firm hold on myself—both mind and suffering bod—and soon a nurse came and removed the pillars. "How did they get in?" she asked. "I'll get you a flatus tube. Would you like an injection?" Dear nurse, I watched the bubbles winking at the brim and felt that not even nylons, cigarettes, or black-market whisky could ever repay you.

Letters to the Editor

OSTRACISM OF THE TUBERCULOUS

SIR,—Dr. B. G. Edleston (July 16) does a valu service by drawing the attention of the medical profe to the ostracism suffered by the tuberculous. Ther no doubt that well-intentioned but ill-judged prop has produced grave misconceptions concerning the na of tuberculosis and that these have affected both the public and also many members of the medical allied professions whose work is not directly con with this disease. I recently heard of a case in w a patient in an infectious diseases hospital was foun have pulmonary tuberculosis. The matron of hospital immediately asked that the patient should moved because there were children in the hospital, also because some of her nurses were a bit run do This matron was an intelligent woman, and presuma she would have accepted a case of smallpox or typ without question ; but pulmonary tuberculosis. . . !

I would stress that we as a profession must a the responsibility for this state of affairs. Fifty ye ago consumption was regarded as invariably fatal, nobody bothered much about infection. It is med propaganda which has completely reversed these id and has led to the view that tuberculosis is highly in tious but easily curable if recognised early. Noth could be further from the truth, and although s publicity may cause people to rush to the mass rad graphy unit, so that their disease may be discove early and "cured," it imposes an intolerable burden the ordinary tuberculous patient. *If such a patien* known to be attending a clinic for supervision, if health visitor calls, or worse still if he is suspected having been in a sanatorium, he is liable to be trea *as a pariah by his fellows*. Nowadays, when ev child who coughs is in danger of being X-rayed, ma cases of primary infection are discovered which forme would have passed unnoticed. No doubt this is a go thing, but the immediate result is that the parents lo round for some unfortunate consumptive whom they accuse of having infected the child.

In fairness to the tuberculous, those concerned w the prevention of tuberculosis must make a radi change in their propaganda. The fullest possible pu licity should be given to such facts as the low incide of the disease among children in tuberculosis coloni and the comparative rarity of marital infection. The who have wide experience in the examination of conta can state that the diagnosed case rarely spreads th disease, and that even the patient with a positive sputu is harmless if he takes simple precautions. The patien themselves should be taught to observe these safegua not merely as an attempt to make themselves less inf tious, but because, if they do so, they need have anxiety whatever about *infecting* others. If everyo in the community could be *taught* to cough into a han kerchief, there is little doubt that pulmonary tuberculo would be drastically reduced, if not eliminated.

Dr. Edleston is right in suggesting that the gene hospitals should give a lead by accepting tubercul patients to their general wards. The teaching hospita *in particular, should set an example to others, and* y they are some of the worst offenders. As the oppositi in these hospitals comes mainly from the nursing sta the following remark by Florence Nightingale (*The A of Nursing*) is of interest : "True nursing ignores inf tion except to prevent it. Cleanliness and fresh a from open windows, with unremitting attention to t patient, are the only defence a true nurse asks or needs. Today we may add a Mantoux test and an X ray—bu the principles remain the same.

Brompton Hospital Sanatorium,
Frimley, Hants.

A. F. FOSTER-CARTER.

SALARY SCALES

Sir,—May I support your correspondent “ Chairman ” last week's issue ? Now that hospitals are no longer on a charitable basis they must be run on the basis a business. If in business an employee is required employer decides what salary will attract the man woman he wants. If he gets no satisfactory ponse to his advertisement he reconsiders the matter, rticularly with a view to upgrading the salary ; and salary eventually offered is that which *will* attract person he wants.

Hospitals are being cramped by the new principle salary scales. For example, in my city I have little ficulty in getting domestic staff on the basis of the ary scales, but my colleague, the medical superin- dent of the mental hospital, which is some 4 miles t and off a bus route, has great difficulty. It is vious that if he was in private business he would mediately offer more to attract people ; he would ssibly even organise a bus service ; but with salary les laid down he cannot do that.

As a concrete example, we are having great trouble er cooks. Our nurses' home caters for about 500, d as the living conditions of nursing staff are by no eans good it is most important, to my mind, that at y rate their feeding should be up to the best standard. it a chef at a hotel can get several pounds a week ore than we are allowed to offer. When we advertised the salary scale, we got two totally unsatisfactory plies. Our present cook, whose salary was decided fore the Act came into force, is leaving because the lary is too low.

No business could be successfully run on this basis. business would immediately get a cook and pay the lary required, and it seems to me that if hospitals are ot to be inhibited they must be given full licence to gage people at the remuneration required to obtain e person needed at the particular hospital for the rticular job. Salary scales are very good things, rovided they are regarded as a minimum ; but when ey are absolutely fixed and rigid they become a enace.

SUPERINTENDENT.

⁂ This subject is discussed in a leading article.—ED. L.

FOOLPROOF BLOOD-TRANSFUSIONS

Sir,—In his erudite letter of June 18 Dr. Wiener rites of mishaps due to occasional errors by a highly rained technical staff. The chief dangers of blood-ransfusion, however, lie in its wide use by doctors who ave had no adequate apprenticeship in grouping, collecting, storing, transporting, and administering blood, nd do not fully recognise the risks these operations nvolve.

Clinicians would be less confident in the safety of lood, and therefore more eclectic in its use, if they kept n mind the many possibly weak links in the chain of ts production. I have seen errors, for example, occur here the donor's blood-group was inaccurately recorded ecause infected serum was used for grouping. (All est sera should, I think, be labelled with the details of heir agglutinins and not only of their respective group-gglutinogens.) Or defects in the blood—arising either rom old age or infection—may have been masked by haking. (Once put in store, a bottle of blood should ot be shaken until a competent observer has carefully xamined it for evidence of abnormality.)

Assuming the blood itself to be beyond reproach, here are still risks in transfusion which are insufficiently ppreciated. The idea that large quantities can be ransfused rapidly without danger is based on war xperience with previously healthy young men, and is napplicable to the aged or chronic sick, for whom the choice of fluids, and the amount and rate of their administration, need careful consideration. A single pint of blood, especially if fresh, will often improve a patient's condition sufficiently to allow the *vis medicatrix naturæ* to complete the cure ; but in such cases the likelihood of benefit must be balanced against the risks inherent in transfusion. For the less expert, there is much truth in the saying that blood should not be given at all unless five pints are needed. It has to be remembered that all reactions—and they are not as uncommon as they should be—increase the burden borne by the patient. Even a mild reaction may provoke further hæmorrhage in a patient who has recently bled, and every known precaution must therefore be taken where a person has been previously transfused or may require transfusion later.

Blood-transfusion has in recent years developed into a mass-produced remedy which daily presents fresh problems. In the hands of experts it is virtually safe, and very valuable ; but there is little doubt that today, in this country as elsewhere, many deaths supposed to have occurred “ in spite of transfusion ” have really been *caused by it.*

Administration of fluids is not a duty that should be “ relegated ” to inexperienced juniors. It is not just a problem of minor surgery. In fact, there are few risks in transfusion when the doctor fails to insert a needle or cannula into a vein ; they begin to mount once he succeeds.

London, N.4. I. H. MILNER.

HORMONE TREATMENT OF THE SEXUAL OFFENDER

Sir,—The article of June 11 by Dr. Golla and Dr. Sessions Hodge is of interest to me since it confirms my initial observations on the value of œstrogenic preparations in the treatment of sexual offenders.

Since 1940 I have used stilbœstrol in the treatment of sexual offenders and for inhibiting libido in sexually aggressive psychiatric males committed to mental hospitals. I prefer stilbœstrol because by oral administration I can better control and regulate dosage to meet individual requirements. In my original article I reported that the degree of the gynæcomastic reaction invariably produced in males receiving stilbœstrol closely parallels the extent to which the anterior-pituitary gonadotropins and the 17-ketosteroids are depressed the extent of the degeneration in the cells of the seminiferous tubules, the inhibition of spermatogenesis or azoöspermia, and the degree of suppression of libido and the patient's ability to mechanically stimulate penile reaction. As the breast reaction resolves, libido reappears, degenerative changes in the tubules cease, and the gonadotropins and 17-ketosteroids increase. However, when stilbœstrol is administered in large dosage—5 mg. over an extended period—atrophy of the testes results and the changes in the size of the testes are permanent.

The need for an objective therapeutic reaction to indicate the adequacy of therapy is particularly apparent in psychiatric male patients. In this group of patients 1 mg. of stilbœstrol is usually sufficient to depress libido and maintain gynæcomastic response. Here the advantage of stilbœstrol-induced testicular atrophy over castration is that the climacteric symptom is avoided : furthermore, any degree of testicular atrophy may be produced.

The target point of stilbœstrol action in suppressing libido and penile reaction appears to be, as Dr. Spence (June 25) presumes, the inhibition of anterior-pituitary gonadotropin production. This could be tested by administering stilbœstrol to the eunuchoidal patient with infantile atrophic testes, normal or high gonadotropins and androgens in the urine, and normal libido. We studied the comparative effects of ethinyl œstradiol and methyl testosterone in a recent surgical castrate with normal libido. In this patient both hormones were of equal value for the flushes and sweats, but ethinyl œstradiol *failed to produce the sense of "well being" and metabolic balance* which is maintained with methyl testosterone. The libido of the patient practically ceased while ethinyl œstradiol was administered. In view of the patient's progressive weakness and weight loss during the period of œstrogen therapy we attributed diminished libido to his constitutional state; we have found that in patients with severe male hormone deficiency the general constitutional effect of methyl testosterone must be established before libido is stimulated.

The report by Dr. Golla and Dr. Sessions Hodge clearly establishes that castration for the treatment of sexual offenders should be abandoned.

Philadelphia. CHARLES W. DUNN.

PREGNANEDIOL IN URINE

SIR,—Your editorial last week on hormone assays gives an unfavourable impression of the value of pregnanediol estimation, which was discussed at the twelfth British Congress of Obstetrics and Gynæcology. My remarks in the discussion were not reported by you (p. 164), and I would like briefly to restate them.

Firstly, in answer to Dr. P. M. F. Bishop, the estimation can be, and is carried out in my laboratory as a routine test by the technical staff. No special arrangements need be made, and any specimen delivered here before lunch is reported on the same day. Secondly, in answer to Dr. G. I. M. Swyer and Dr. A. C. Crooke, the results are inaccurate if the amount of pregnanediol is calculated as per unit volume of urine. The output per hour, however, is apparently constant over a short period, and if the pregnanediol is calculated as per unit of time the results are much more consistent. My clinical colleagues find them of value. It is possible to arrive at the daily output on this constant hourly excretion without the necessity of obtaining 24-hourly specimens.

My series is as yet too small to justify publishing figures, but I hope later to present a full analysis of my results.

DAVID STERN
St. Woolos Hospital, Newport, Mon. Pathologist.

PAIN

SIR,—In his interesting observations on the rôle of the cortex in the perception of pain, a matter of great importance to us, Mr. Theobald (July 16) brings to notice how in the excitement of battle a man may be unaware that he has been wounded. The most striking account of this phenomenon is to be found in the pages of Lucretius, who describes it with the eloquence of a poet and the relish of a schoolboy.

> "So they record how the scythed chariots, reeking with indiscriminate slaughter, suddenly chop off the limbs, and the severed part that falls is seen to quiver on the ground; but such is the quickness of the injury and the eagerness of the man's mind that he cannot feel the pain; and because his mind is given over to the zest of battle, maimed though he be, he plunges afresh into the fray and the slaughter. And here among the horses is one unaware that his left arm, shield and all, has been torn off by the wheels and devouring scythes and lost; and from another the right falls, and yet he mounts and presses on; and there is one who has lost his leg, but struggles to rise, while hard by upon the ground the dying foot twitches its toes; and when a head is chopped off from a warm and living trunk, it keeps for a moment the look of life and the eyes remain open, until the last traces of the soul are given up." III, 642–656. (I follow Munro's punctuation in l. 646 and take *vis* and *mens* in l. 645 to be a hendiadys.)

The Romans illustrate Mr. Theobald's contention that susceptibility to pain varies with environment and heredity. With their fortitude, stoicism, ferocio punishments, and bloodthirsty amusements they m have been much less sensitive than we are, even thos us who have eschewed the blighting influences of " cinema, the lurid press, and aspirin," but not, I sup of "the other factors." *If* only Mr. Theobald could us what these are, we should be wiser men still!

Orpington, Kent. H. St. H. VERTU

EPIDEMIOLOGY OF POLIOMYELITIS

SIR,—With regard to Dr. Lambert's letter in your of July 23, we have had some cases of poliomy here this year, the first two being notified in one hold on June 18 although the dates of onset were Jun and June 11. Local inquiries indicated that there been some transient obscure illnesses in the family in the neighbourhood, but there had been no recogni case of poliomyelitis in the borough since the previ October. These other cases could not definitely regarded as poliomyelitis, but it seems likely that poliomyelitis virus was present in the borough f *the end of May or the beginning of June.* On June (a Monday) I had a letter saying that two dead hedgeh had been seen three days previously lying in a ro which road happened to be within the affected area a little over half a mile from the two recognised case poliomyelitis. The road where they were found is n a public park. I asked the refuse collection departm whether dead hedgehogs were at all commonly found roads or refuse bins, but I was told the occurrence exceedingly rare. I then telephoned the Virus Refe Laboratory to see if they were interested in view of coincident poliomyelitis cases, but they told me t were not. Nothing further was therefore done.

I would add that two years ago when we had 80 recognised cases of poliomyelitis in the borough incidence of 35 per 100,000 population) there were reports of dead hedgehogs being found prior to or dur the outbreak.

E. H. R. SMITHARD
Catford, London, S.E.6. Medical Officer of Healt

MALE TOADS IN PREGNANCY TESTS

SIR,—We were very interested in the article of Jul by Dr. Klopper and Mr. Frank. While welcomi the results of their experiments, we note that th did not refer to our account of 610 tests[1]—one of t first publications on this subject in Europe.

As we there observed, we found *Bufo vulgaris* equ satisfactory, but we soon changed to *Rana escule* for the following reasons: (1) *B. vulgaris* is n available in every season of the year; (2) *R. esculen* has proved more sensitive, giving a positive res with only 10–12 units of gonadotrophic hormone 5–6 units when hepatectomised); (3) *R. esculenta* more resistant to the toxic effects of some urines. Th findings may explain the high incidence of false negati from *B. vulgaris* as compared with our results (l than 1%).

We have now made over 1100 tests in all seaso Frogs caught in winter are less sensitive, requiri about 40 units of gonadotrophic hormone for a posi result. We have been able, however, to restore normal the sensitivity of hibernating frogs by givi them 1 μg. of thyroxine 24 hours before injection the urine. After administration of thyroxine posi results have sometimes been obtained with as little 5–6 units; but thyroxine does not increase the sensitivi of frogs caught in any other season.

I. BACH
OTI Hospital, Budapest. I. SZMUK.

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[1] Bach, I., Szmuk, I., Robert, L., Klinger, B. *Lancet*, 1949, i, 1

PYOPERICARDIUM

ɪʀ,—Dr. W. E. Gibb's article[1] called to mind four s of pyopericardium seen in 1940–41 at the Royal pital, Wolverhampton, where they were under the of Dr. J. H. Sheldon.

ᴀsᴇ 1.—A man, aged 28, was admitted on Dec. 27, 1940, two days' history of fever and pain in the left chest. Signs onsolidation were present at the left base, and he was ted for lobar pneumonia with a standard course of sulpha-dine. On Jan. 5, 1941, pericardial friction developed, recrudescence of fever and precordial pain; two days signs of pericardial effusion were present, and diagnostic ration revealed a greenish purulent fluid, of which about ml. was withdrawn; this contained pneumococci. The hapyridine was continued, and after a further aspiration 20 ml. fever subsided and the signs of pericardial fluid ppeared.

ttempted aspiration on Jan. 21 showed a dry tap. At time he developed venous back-pressure, with congested k veins, tender enlargement of the liver, œdema of sacrum ankles, and ascites. He was treated with digitalis and salyl, and during February these features gradually sub-d. He was fit for discharge on March 6, and follow-up wed that he made an uninterrupted recovery and was ng a full day's manual work without dyspnœa, hepatic argement, or œdema.

ᴀsᴇ 2.—A welder, aged 20, admitted on May 25, 1941. ile at work a month previously he had been taken suddenly with severe gnawing pain in the front of the left chest ravated by breathing. He had become very breathless, l for a week had had a cough, worse at night, with greenish tum, and also a sharp pain in the left shoulder which npelled him to lie on the right side during sleep. There l been no fever, but his pulse had been noted to be very id.

On admission he was extremely pale and orthopnœic, with id and laboured respiration. The pulse was of poor lume, regular, rate 130 per min.; the blood-pressure was /80 mm. Hg. His neck veins were engorged and there was ting œdema of the lumbar region and ankles. There were ns of bilateral pleural effusion extending up to the third ace in both axillæ. The cardiac impulse was diffuse and apex-beat was palpable in the fourth intercostal ace, 3 in. from the midline. The area of cardiac dullness s enlarged, extending to 3 in. from the sternum in the ird space and blending with the dullness of the pleural usion below this; it was also enlarged to the right. The art sounds were distant, and pericardial friction was audible the second space. The abdomen was distended with cites, and the liver ballotable at the level of the umbilicus. e urine contained albumin and hyaline and granular casts. diography showed enlargement of the heart shadow. The esence of bilateral hydrothorax was confirmed. The white-ll count was 17,000 per c.mm. (polymorphs 88%, mphocytes 10%, monocytes 2%).

The pericardium was explored on the day of admission, but fluid was obtained. In view of the normal temperature e diagnosis seemed uncertain, and mercurial diuretics were gun. By June 3, however, the patient's condition had rther deteriorated; dyspnœa was considerable, and œdema d ascites were becoming more pronounced (resembling shberg's hypodiastolic cardiac failure). A second aspira-n of the pericardium produced a greenish purulent fluid, oz. of which was removed with great relief to the dyspnœa; e pus contained pneumococci.

The temperature now rose to 102–103°F. Chemotherapy ith sulphapyridine was commenced in standard dosage, and ricardial pus was replaced by sodium sulphapyridine suitably luted with saline; between June 5 and 15, altogether 35 oz. of pus was removed, and on June 24 a dry tap was ade. Meanwhile, on June 14, his course was interrupted left-sided spontaneous pneumothorax.

The last complication was infection of the originally sterile dema fluid on the left side. Weekly aspiration of 2–3 pints purulent fluid from this side was followed, on July 18, by tercostal drainage. The patient's condition improved; b-resection was performed on Sept. 20; and he was well ough to be discharged on Oct. 17. He has since recovered mpletely.

Cᴀsᴇ 3.—An infant of 15 months was admitted on June 15, 1941, with right lower-lobar pneumonia for which he received sulphapyridine. He improved rapidly, and the chemotherapy was discontinued after five days. He subsequently developed slight pyrexia (99°F) and was thought to have an empyema at the right base; but X-ray examination showed no evidence of this, and on July 2 he was discharged owing to a diphtheria outbreak in the ward. Three days later he was readmitted, waxy pale, and slightly cyanosed; there was clubbing of the fingers; examination of the heart revealed nothing abnormal apart from a tachycardia of 120 per min.; while in the chest there was poor entry at the right base, and bronchial breathing in the right upper zone. Exploratory needling of the chest proved negative. The white blood-cell count was 12,600 per c.mm. with relative lymphocytosis (56%); radiography showed no abnormality.

For the next three months the child went slowly downhill, with slight fever and attacks of severe tachycardia (up to 200 per min.) and cyanosis lasting a few minutes, and in the late stages gross enlargement of the liver and microcytic anæmia (hæmoglobin falling to 58%). Repeated examination of the chest showed bronchial breathing on the right side and occasionally showers of crepitations, but at no time were there signs of pericarditis. During second and third courses of sulpha drugs the fever subsided, but it promptly recurred after the course.

Autopsy revealed a well walled-off abscess in the pericardial sac posteriorly, smears of which contained many pneumococci.

Cᴀsᴇ 4.—A boy of 16 for a week before admission on Nov. 28, 1941, had had fever, loss of appetite, nausea, and headache. For five days he had had pain in the front of the right chest exacerbated by respiration. Fever continued (temperature 101°F) with profuse night sweats and considerable dyspnœa. Nothing abnormal was noted in the heart, but in the right chest anteriorly there was a small area of pleural friction. The urine contained albumin and a few pus cells. White blood-cells numbered 17,000 per c.mm. (81% polymorphs).

He was treated with sulphapyridine as a case of pneumonia, but though the pyrexia settled progress was unsatisfactory. On Dec. 2 the heart sounds were faint and the liver enlarged and tender. The next day examination indicated a large pericardial effusion. The liver was larger and there was some ascites and œdema of the ankles. Aspiration of the pericardium on Dec. 4 yielded a thin greenish fluid; one pint was withdrawn and 8 g. of soluble sulphapyridine in saline injected. Cultures of the fluid grew hæmolytic streptococci. Aspiration and replacement was repeated twice, the fluid becoming progressively more purulent; on the last occasion culture was sterile.

The pyrexia settled by Dec. 14, when a dry tap was made. After a long convalescence he was discharged on March 19, though even then there was some dyspnœa. I am informed that he died of constrictive pericarditis about eighteen months later.

These cases illustrate the varied clinical picture of the disease, and the difficulties in early diagnosis; Osler said that no serious disease is so frequently overlooked as pyopericardium. The most important cardiological finding is enlargement of the area of cardiac dullness; and percussion is most valuable. Hypotension, with low pulse-pressure are common, but "pulsus paradoxus" is neither a constant nor a very convincing sign. X-ray examination may provide no guide unless more than about 500 ml. of fluid is present in the pericardial sac; so exploratory puncture is often necessary. Even now it is difficult to see how the correct diagnosis could have been made in case 3, where the fluid was situated posteriorly in the oblique sinus.

"Hypodiastolic heart-failure" develops as a result of pressure on the great veins entering the heart.

The injection into the pericardial sac of alkaline sulphapyridine is risky; but in the 2 cases where it was performed the risk was justified by the results. No doubt penicillin given in the same manner will prove of great value.

I wish to thank Dr. J. H. Sheldon for permission to publish these cases.

St. Bartholomew's Hospital,
London, E.C.1.

K. W. G. Heathfield.

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[1] *Lancet*, 1948, ii, 891.

MECHANICAL RESPIRATION

SIR,—I read with great interest Dr. Ritchie Russell's letter of July 23. I shall certainly get the publication he mentions to see whether the Americans are able to do more than we are. I mentioned the Oxford inhaler because many small hospitals might have an inhaler in the anæsthetic department and could therefore start treatment with it immediately. The inflator is better if it is available.

The McKesson resuscitator is timed with the respiratory rate which suits the patient, but we find most patients need practice in its use; once they have learnt to use it it is very satisfactory and its administration needs less skill than a manually worked apparatus; it is also a great saver of nursing time.

The illustration of the Stille respirator in my article shows the advantages—namely, the limbs are free for physiotherapy, if tracheotomy is necessary it can be done since there is no collar, and catheterisation is an easy matter. The chief disadvantage is that the machine is not fitted for all sizes of patient, and therefore I suggested that a greater range of shields should be obtainable.

I agree with Dr. Ritchie Russell that bulbar cases should not be treated in a respirator, but if respiratory failure supervenes the only treatment is postural drainage, mechanical respiration, suction of mucus, and perhaps in some cases tracheotomy in addition.

Western Hospital,
London, S.W.6.

URSULA BLACKWELL.

GROUP-ANALYTIC PSYCHOTHERAPY

SIR,—May I take up some of the points raised in your review of my book *Introduction to Group-Analytic Psychotherapy* (June 18)?

First, my approach is not "a mixture of psycho-analytic and 'supportive' measures." It is a consistent development of a method and an integrated body of concepts; and this book is an attempt to give an introductory account of these, since they were first put into operation ten years ago. This method of group psychotherapy represents a principle of orientation which I have designated "group analysis" or "group-analytic." I am aware that more recently a number of group therapists, both here and in the U.S.A., refer to their forms of group treatment as "group analysis" or "analytic group therapy" and the like, under which labels they practise a number of widely different techniques, differing not only from my own but also from each other. There are also a great variety of group treatments going on which may be called supportive, but neither the one nor the other of these types of approach has had much influence on my own, either historically or factually, so far.

In the second place you fall into the same error as most people, who think, when they hear of group analysis, that they must be dealing with a direct application of psycho-analysis. In my book I make a point of showing that this concept is wrong. It is as desirable for psycho-analysis as for group analysis that this mistake should be avoided.

Thirdly, I agree with you that the group situation exerts a strong supportive influence; so also, in my opinion, does the conductor, whether he knows or wants it or not, in his capacity as an archaic leader (father) figure. Any form of group treatment is bound to mobilise these forces in one way or another, whether blindly or deliberately. In group analysis these supportive energies are used principally to sustain the group in the analytic process, and not for their more immediate therapeutic effect, great as this is. Direct supportive remarks and actions play no significant part in my approach; and guidance, admonishment, reassurance, &c., with which you credit me, are not in my repertoire —not to speak of "punishing" actions or "removing difficult patients from the group." I think you fa distinguish between the group-analytic situation and episodes described in my book to illustrate dynamics, which took place in a totally different co This may be my fault for not having stressed the diff sufficiently.

Finally, as to "casualties"—by which is patients who stay away after one or two sessions. patients are not particularly common in my experi but I cannot say in the absence of figures whether are more or less common with me than with group therapists. Moreover, they do not leave spite of reassurance." On the contrary, their could easily be reduced if more influence were to induce them to carry on. The point I wanted apparently have failed) to make is that this self-selec process, just because it is allowed to take effect, good example of the diagnostic value of the situation, and its economy. In cases of this kind, economy is genuine because the consequences are wh favourable—to both the group and the particular (the "casualty")—provided the situation is handled and followed through by the therapist. I some illustrative examples in the book. The who is thus excluded by the group, or takes himself belongs usually to one of three categories: either h not amenable to successful psychotherapy at the ti or he needs special individual attention; or he (at least ideally) be absorbed into another group wh he might well thrive.

London, W.1.

S. H. FOULKE

THE PLACENTAL BARRIER

SIR,—The following results appear to be of s interest in relation to the passage of hormones across placenta.

A patient near term was found on vaginal biopsy to chorionepithelioma. The Aschheim-Zondek test was don dilutions of 1/10, 1/100, and 1/1000, using 2 ml. for e mouse. The 1/1000 gave a weak positive reaction, the ot strongly positive reactions. Delivery was by section, and first sample of the baby's urine, passed within 48 hours birth, was examined; undiluted, it gave a negative Aschhe Zondek test. Three months later the test was again negat The diagnosis in the case of the mother was confirmed p mortem.

In view of the great quantity of hormone in maternal circulation, these findings appear to show th the chorionic gonadotropin does not pass the placent

Bernhard Baron Memorial Research
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Maternity Hospital, London.

R. M. CALM
JOHN MURR

GRADING

SIR,—Many of the discrepancies in the grading consultants are attributable to the lack of criteria. T St. Helier Group Medical Advisory Committee beli that to be graded as a consultant a specialist s (1) have held an appropriate higher qualification for or more years, (2) have had training and experience his specialty, (3) be capable of practising his special without supervision, (4) have held a hospital appointment prior to July 5, 1948, and (5) be recogni by his colleagues, in his district, as a specialist.

In considering the senior medical staff of our h the committee find that they are divisible into three groups:

1.—Those who are entirely engaged in specialist hold an appropriate higher qualification, and have a hosp appointment as a specialist, should without question recognised automatically as of consultant status.

2.—Those not entirely engaged in specialist practice holding an appropriate higher qualification and a specia hospital appointment and recognised by their colleagues the district as specialists, should also have consultant

—(*a*) Those who hold a hospital appointment as a specialist gh not holding an appropriate higher qualification should, eason of their experience, be retained as senior hospital ical officers. (*b*) *In exceptional cases practitioners with* ecialist hospital appointment of many years' standing recognised by their colleagues in the district as specialists, not holding a higher qualification, should be considered consultant status.

he committee feel strongly that some classification the above lines should be drawn up, approved, and epted *to guard us, not only from the Minister and* satellites, but even, unfortunately, from some of our ı colleagues.

P. M. KELLY
Hon. Secretary, St. Helier Group
Medical Advisory Committee.

Parliament

QUESTION TIME

Anæsthetic for Dental Treatment

ir JOHN MELLOR asked the Minister of Health why, for tal treatment under the National Health Service, an sthetic was administered by a doctor without charge to atient on his list, whereas for similar treatment by a vate dentist, the same doctor charged the same patient a for such anæsthetic; and whether provision would be de for the right to receive an anæsthetic under the National alth Service to be the same in the case of treatment by a vate dentist as in other cases.—Mr. ARTHUR BLENKINSOP lied: Responsibility for providing an anæsthetic for ıtal treatment carried out under the National Health vice rests on the dentist who receives payment for the ninistration of the anæsthetic and makes his own arrangents with the anæsthetist. The treatment which a doctor equired to give a patient on his list does not include the ninistration of an anæsthetic at a dental operation, and re is nothing to prevent the charging of a fee for this vice where the dental treatment is given under a private angement.

Medical Examination of Teachers

Mr. ANTHONY GREENWOOD asked the Minister of Education w many local education authorities insisted upon candidates appointment as teachers being examined by radiography.— . GEORGE TOMLINSON replied: Some local education thorities require candidates for appointment as teachers undergo a medical examination before appointment, but lo not know how many require an examination by radioıphy. Mr. GREENWOOD: Would the Minister look into the ıtter again? In view of the importance of preventing spread of disease, would he consider publishing a list of authorities which do not insist on radiography, so that ndidates for appointment will know the advantage which ey are missing and parents will know the danger to which ildren are being exposed?—Mr. TOMLINSON: Most of the ndidates submit themselves for medical examination. am more concerned about mass radiography, if it is to be plied, being applied to teachers after they have done some ıching rather than before they have actually done any.

New Hospital for Basingstoke

Mr. P. W. DONNER asked the Minister of Health when ilding on the new Basingstoke hospital is likely to begin.— . A. BEVAN replied: I understand that the regional hospital ard is considering the provision of a new hospital in Basingoke, but progress must depend on its urgency compared th other calls on the available money and building resources. r. DONNER: Is the Minister aware that some £24,000 was luntarily subscribed in this town for a new hospital, and at there is deep dismay that apparently this money is w absorbed in a general pool, with little prospect of a new spital?—Mr. BEVAN: They would not have been able to ild much of a hospital for £24,000, or maintain it after it ıs built. Money has to be found, and had to be found fore the Act, for the maintenance of voluntary hospitals.

Mr. DONNER asked the Minister whether he was aware that e Basingstoke hospital service was now responsible to inchester group, which was responsible to the region, which turn was responsible to the South-Western board; that penses of operation had been increased by this system as well as by the appointment of officials and that delays due to this centralised control marred the efficiency of the service; and whether he would simplify control.—Mr. BEVAN replied: *If the hon. member will send me evidence of delays and* increased expense I will investigate them, but I am not prepared to consider unsubstantiated statements. Mr. DONNER: I will certainly send the Minister such evidence. Is he aware that the chairman of the hospital committee has resigned, and that the general view in Basingstoke is that the town is very much worse off since the health service was begun?—Mr. BEVAN: I doubt very much whether that is the general view in Basingstoke. At any rate there are between 10,000 and 11,000 voluntary workers in the hospital system, and this is the first resignation which we have had. Mr. DONNER: Is the Minister aware that if he visits Basingstoke he will be able to confirm the truth of what I have said?—Mr. BEVAN: I may even consider addressing a meeting at Basingstoke to find out what the people think about it.

Redistribution of London Doctors

Mr. J. F. F. PLATTS-MILLS asked the Minister if he was aware that in the borough of Finsbury there was only one doctor to every 3678 of the population, compared with one for each 2935 in Islington and 2429 in Holborn; and what action he was taking to bring the number of doctors in Finsbury up to the level of the best London borough.—Mr. BEVAN replied: Redistribution of the available supply of doctors in accordance with the best interests of the public must be done gradually. The method of remuneration under the National Health Service, coupled with the powers of the Medical Practices Committee to close over-doctored areas to new entrants, should be sufficient to bring about the desired result.

Obituary

RICHARD WALTER MARSDEN

M.D., B.SC. MANC., F.R.C.P.

ON July 10 Dr. R. W. Marsden died, aged 81, at his home in Withington, Manchester. He came of a family springing out of the Craven district of Yorkshire, but he himself spent nearly all his life in Manchester, where his father, Henry Marsden, J.P., was for several years a councillor of the corporation, and most of his medical work was done in the health service of the city.

In 1887 he took a B.SC. degree at the Owens College and in 1891 he qualified with the Conjoint diplomas. Having held a house-appointment at the Manchester Royal Infirmary, he went to the New Bridge Street receiving office, and thence to the Monsall Fever Hospital, where he became superintendent. A period in medical consulting practice followed, when his skill in fever work gave a special call for his services and during which he acted as physician to the Ancoats Hospital, and to the Consumption Hospital. In 1906 he was appointed superintendent of the Crumpsall Hospital and he held this post for 27 years. On the outbreak of war in 1939 he was persuaded to undertake work at the Parkside Emergency Hospital, Macclesfield, looking after disabled soldiers.

Marsden's writings are mostly about fevers, on which he wrote two books: his *Hints on Management of the Commoner Infections* appeared in 1906 and his *Practical Textbook on Infectious Diseases* two years later. He was a firm believer in the antipyrexial treatment of fevers by water baths. As a teacher he excelled, and "one feels it a pity" (writes a colleague) "that he did not have more to do with students. But in his hospital work the staff, *medical and nursing, had full opportunities* of learning from him much that was useful to them. I remember well how in his typhoid wards Dr. Marsden showed a rash which certainly was not typical, and, after allowing the students to make wild guesses, quickly settled the presence of scabies by means of a needle and microscope."

Up to the end he was an active member of the Manchester Medical Society, of which he was for 8 years treasurer. In 1928, as president, he gave an interesting address in Changes in Medical Practice in the last Forty Years. He was elected F.R.C.P. in 1929.

Dr. Marsden was twice married; first in 1916 to Mary Sharpe, who died in 1937. Their three sons are all doctors: one a surgeon lieut.-commander in the Royal Navy; another an assistant medical officer at the Manchester Skin Hospital; and the third a pathologist at the Pendlebury Children's Hospital. His second wife, Iris Beatrice Whittaker, survives him.

BRIAN RAIT-SMITH

B.A. CAMB., M.R.C.S., F.F.A. R.C.S.

Dr. Brian Rait-Smith, anæsthetist to St. Bartholomew's Hospital, died at St. Albans on July 14, aged 45.

After taking his B.A. at Cambridge in 1926 he completed his medical studies at Barts, where he took the Conjoint qualification in three years later. He held a resident appointment as anæsthetist there before he took his D.A. in 1935, joining the staff two years later. He also held appointments at the then British Postgraduate Medical School, the Brompton Hospital, and Papworth Hospital, Cambridge, and he was a consultant anæsthetist to the London County Council.

The last ten years of his life were spent at St. Albans where at the beginning of the late war he was transferred to Hill End Hospital. Of these years a colleague writes: "Hill End, at that time a mental hospital, was rapidly transformed into an E.M.S. establishment capable of dealing with every type of case. It was probably the only hospital in the country housing under the same roof full-scale orthopædic, thoracic, neurosurgical, and plastic units, while at the same time dealing with E.N.T. and general surgery. At all these branches of his specialty Rait-Smith was adept, and he did some excellent original work on the anæsthetic problems involved in the many new operations of cardiac surgery. Some of his observations were recorded in a recently published paper on the subject.

"The later years of his life were marred by continuous ill health of which he made light, and although he knew that a threat hung over his head he did not allow this knowledge to poison his outlook on life. An excellent teacher, he hated humbug and with puckish humour could deflate the most swollen-headed student in a few words, which however, left no permanent sting behind."

GEORGE ALEXANDER MACDONALD

M.D. EDIN.

Dr. G. A. Macdonald, a founder of the London College of Osteopathy, died on June 30 at the age of 57. The son of the late James Macdonald, at one time secretary of the Highland and Agricultural Society of Scotland, he qualified M.B. in the University of Edinburgh in 1914, and soon afterwards, as a member of the special reserve R.A.M.C., he was called up for service. With the rank of captain he served in India throughout the 1914-18 war.

After the war he studied for two years in the Kirksville College of Osteopathy, where he obtained the degree of doctor of osteopathy in 1920. Later he practised osteopathy in Edinburgh in partnership with his brother, the late Dr. Kelman Macdonald, and in 1925 he settled in London. His standing as an osteopath was recognised by his colleagues and he was for many years president of the British Osteopathic Association. He made a well-known contribution to his subject in *The Osteopathic Lesion*, written with W. Hargrave-Wilson and published in 1935.

G. E., to whom we are indebted for this memoir, writes: "Macdonald worked for the inclusion of osteopathy in medical practice. He looked forward to the time when all qualified osteopaths would be medically qualified as well. He felt a personal call to implement this aspiration, and in spite of opposition he took a leading part in founding, for medical men, the London College of Osteopathy, of which he was the first dean. He made a great contribution to osteopathy, not only in the skill with which he practised it but also in the high standard that he maintained in his work. Practice in London came slowly at first, but his sympathetic nature soon won him many friends, and once his practice was established it grew rapidly, simply because of the real benefit that his patients derived from his treatment. His kindness to his patients and his understanding them was great and good; his relations with the med profession were friendly and true. A real Sco loved his country and he spent his holidays in Perth

Dr. Macdonald leaves a widow and a son and a

CHRISTOPHER JAMES LEWEN SHARP

M.C., M.B. CAMB.

MANY besides old Londoners will have heard regret of the death on June 6 of Chris Sharp. E at St. Paul's School, where he was captain of and at Cambridge University, he completed his studies at the London Hospital after the last taking the Conjoint qualification in 1924 and his three years later. After holding house-appo at the London he settled in practice at the Devon of Sticklepath, where he was to spend the rest of his

L. N. J., who knew him pretty well for 45 year school, as a field gunner in the first war, as an u graduate, medical student, and doctor, writes: "I of Chris as a sensitive person of high courage, b generosity, and perennial good humour, who p games well and the piano better than most ama Coming of an artistic stock—he was a nephew of Sharp—he was fastidious with a critical faculty developed in many directions. It amused him to as a fool, but he was, in fact, very far from being bogus or pretentious persons had reason to drea bland Socratic questioning. Always convivial by —as a small boy he could drink twice as much as the rest of us—he nearly lost his life during the war through digging out a teetotal comrade unde and poison gas. For this and other exploits he decorated—much to his amusement. Whilst he w hospital I visited him. He was on the danger list the ward sister on tiptoe and with finger to lip beck me to the bedside. He was temporarily blinded, blistered, and had bronchopneumonia. 'How are y I asked fatuously in a whisper. 'Oh, I'm very near right, ol' boy,' he replied, 'and if I could get out of and have a pint I should be quite all right.' He an uninterrupted recovery."

Births, Marriages, and Deaths

BIRTHS

BALL.—On July 19, at Llwynypia, Rhondda, the wife of Ca H. C. Ball, R.A.M.C.—a son.

BENIANS.—On July 15, in London, the wife of Dr. R. G. Beni a daughter.

CALMONSON.—On July 21, in Manchester, the wife of Dr. A Calmonson—a daughter.

CHILDS.—On July 20, the wife of Dr. Michael Childs—a daught

FRASER.—On July 19, the wife of Dr. T. A. Fraser—a daughter.

GRAHAM.—On July 22, in London, the wife of Dr. Ian Graha a daughter.

HUTCHIN.—On July 18, the wife of Dr. K. C. Hutchin—a daug

JACOBS.—On July 18, in London, the wife of Dr. J. J. M. Jac a son.

LESLIE.—On July 19, at Sheffield, to Dr. Mary Leslie (née Bra waite), the wife of Mr. G. F. Leslie—a daughter.

LOVE.—On July 17, at Stockport, the wife of Dr. William Lo a daughter.

SWAN.—On July 15, at Storrington, the wife of Dr. J. F. S —a son.

TWINING.—On July 22, at Okehampton, the wife of Dr. D Twining—a daughter.

MARRIAGES

CATES—CLARKE.—On July 12, at Dartford, Bernard Cates, to Blanche I. L. Clarke.

GIBSON—WHITELEGG.—On July 14, in Guernsey, Richard Ed Gibson, O.B.E., F.R.C.S., to Margaret Chamberlain Whitele

MOSS—SMITH.—On July 16, in London, John Moss, M.B., to S Smith.

—On July 16, at Oswestry, James Alexa I.C., M.B., to Agnes Eugénie Sladden.

—On July 16, in London, Alexa , to Diana Rose.

WHITE—COOK.—On July 16, at Hatfield Broad Oak, John Ar Temple White, O.B.E., M.R.C.S., to Florence Cook.

DEATHS

CROSSLEY.—On July 20, Leonard Crossley, M.D. Edin.

DALRYMPLE.—On July 17, at Bude, Cornwall, Joseph Da C.M.G., O.B.E., L.R.C.P.E., lieut.-colonel, R.A.M.C. retd, aged

DAVIES.—On July 19, at Southsea, John Phillip Henry D M.A., M.B. Camb., D.P.H.

ROBERTSON.—On July 21, at Fort Augustus, John Joseph Rob M.B. Glasg.

SOUTHEY.—On July 21, at Maidstone, Herbert Watson Sout M.R.C.S., aged 81.

WILSON.—On July 18, at Normanton, Charles Haddon W M.B. Leeds.

Notes and News

NSULTANTS' AND SPECIALISTS' CONTRACTS

announcement by the Joint Committee which we arised last week stated that the Ministry of Health had that individual practitioners are free to leave untouched lelete from the whole-time contract any of the clauses are enclosed in square brackets. The question has been whether similar considerations will apply to the part-contract. In principle, the same considerations will to the part-time contract, but it will be appreciated n most cases the clauses enclosed in square brackets fundamental to the part-time contract.

GENERAL MEDICAL COUNCIL

RING the lifetime of the present Parliament two members been nominated by the King to the General Medical il. Mr. J. J. Robertson has sat with the council since Mr. J. J. Hynd was elected this year but has never part in the proceedings. Hard on his appointment urred to him that he might be infringing the statute of which forbids an M.P. to hold an office of profit under own. True, the statute is somewhat vague and does not ely define what is meant by an office of profit. Members G.M.C. receive 5 guineas for each attendance at a il meeting, and they are paid not out of the State but out of registration fees collected from the medical sion. Nor is it always clear whether offices established 1707 are held under the Crown within the meaning of Act. But the Attorney-General found Mr. Hynd's les not without substance, and on July 12 he introduced to protect Mr. Hynd and Mr. Robertson from their ical infringement of the law. Other M.P.s who have the council in the past are safe from penalties, as any s against them by now are statute-barred. The Attorney-al stated that the present holders must vacate their ntments and in future no M.P. would be qualified to hold office.

REW UNIVERSITY HADASSAH MEDICAL SCHOOL

April 23 Dr. Eli Davis described in our columns the undergraduate medical school which was opened in salem on May 17, with 45 students. At a dinner held in on on July 21 by the Friends of the Hebrew University rusalem, the Minister for Israel said that though the er of doctors in his country was three times as large as d generally be thought necessary, the number who young and vigorous was alarmingly small. The object e school was to meet the needs of the younger generation to provide doctors fully familiar with local conditions. ould contribute to the welfare both of Israel and of bouring countries. Sir Henry Cohen said that when university was opened in 1925 a research institute in biology already existed, and in 1938 the University-ssah Medical Centre came into being. All this time was a demand for an undergraduate school to train tants for doctors carrying on research, and also to give esearch-workers contact with the young inquiring mind. ing considered the curricula of various countries, the ersity chose that of Great Britain as its pattern, increasing ength to seven years; and in 1939 all seemed in train. the war intervened and the school had only now been ed. Having found a new freedom, he trusted that the ersity would realise that help from outside might be ral as well as material: as the real centre of the new the university must be independent of politics and siasticism of certain types; truth must be pursued out fear and expressed without hindrance.

of. Samson Wright, who presided, and who read a message couragement from Sir Henry Dale, O.M., said that even e recent difficult years the medical research departments e university had continued to receive help from the sh Empire Cancer Campaign and the Medical Research cil: when understanding was regained on the spiritual intellectual plane the rest would follow. The university's nt budget was about £700,000, of which its British ds had pledged themselves to raise £100,000, much of h would go to the medical school. He believed that the ersity, through the school, would serve not only Israel all mankind.

r. Redcliffe Salaman, F.R.S., recalled how, as an Army or, he had witnessed the laying of the university's foundation-stones in 1917. He described it as the one great focus of science and research between Rome and Pekin. Dr. A. Felix, F.R.S., said that though 500 doctors had arrived in Palestine this year their professional level was unfortunately not high—which was hardly surprising; and the immigrants of the next few years would be coming from countries where there were hardly any doctors. The difficulties in face of opening the school just now were enormous: any non-Jewish expert would have deemed it madness. But in all the ages Jews had made important contributions to medicine, and they would overcome the obstacles.

University of London

Dr. C. F. Barwell has been appointed to the readership in bacteriology at the London Hospital; and Dr. J. J. Pritchard to the readership in anatomy, and Dr. H. C. Stewart to the readership in pharmacology, at St. Mary's Hospital.

The title of professor emeritus of anatomy has been conferred on Prof. J. Kirk, on his retirement from the Courtauld chair at Middlesex Hospital which he has held since 1937.

At recent examinations the following were successful:

M.S.—branch I (surgery): C. J. Longland, P. P. Rickham *branch IV (otology, rhinology, and laryngology)*: L. F. W. Salmon.

D.M.R.—A. I. Black, J. M. Burbury, D. McC. Gregg, S. J. Hinds, B. M. Jacobson, T. M. Prossor, Ram Singh, Z. L. Szur.

University of Edinburgh

On July 20 the following degrees and diplomas were conferred:

M.D.—E. G. Barnes, A. E. Claireaux,‡ J. W. Fraser, A. D. Gillanders,‖† David Gilmour, J. S. Grant, Barnett Isaacson,‖ Marjory A. Keith,* C. K. McDonald, W. A. L. MacFadyen, Carmichael Mackie, A. B. Monro,‖ Mustafa Niazi, A. W. Williams, J. H. Young.†

C.M.—A. W. Wilkinson.*

Ph.D. (in the faculty of medicine).—Mohamed Mahfouz Abdel Aal, Barbara E. Clayton, Helen N. Duke, J. A. Loraine, H. C. W. Stringer.‖

M.B., Ch.B.—Mary H. Aitken, J. A. D. Anderson, Oliver Archer, P. G. Aungle,§ N. E. Awunor-Renner, J. S. Barrett, J. A. Beattie, M. H. Beaubrun, Boleslaw Bendkowski, J. S. Berkeley, L. H. Berman, W. F. Blair, Dorothy S. Bleakley, Halina Bobinska, D. H. A. Boyd, J. D. D. Brown, J. H. Brown, J. B. Brown, T. A. Brown, I. A. Cameron, I. H. Cameron, Margaret M. Cameron, J. H. Campbell, M. A. Campbell, A. J. M. Carlin, Marion L. Clark, Matilda J. Clerk, W. P. Cockshott, Neil Conley, John Cook, W. F. Coulson,§ Isobel B. Craighead, W. A. Cranston, Janet S. Darling, R. D. McC. Davie, A. R. Dawson, K. S. Deas, Catriona M. Dempster, Pamela M. Dodson, Alice B Doherty, Eleanor J. Durrand, Frances M. Falconer, Helen L. A. P. Fermie, Mary C. R. Fisher, H. M. Flett, Mary L. Fraser, J. A. G. Graham, P. W. Grant, G. H. Hardie, E. R. Harris, Muriel G. Hartley, Susan E. Herdman, J. A. Hislop, Sheila S. Hume, R. S. M. D. Inch, T. T. S. Ingram, J. J. Ironside, Ailine M. W. James, D. A. Johnson, I. M. Johnstone, Leon Kaufman, Margaret Kennedy, I. H. Kidd, Robert Kilpatrick,§ J. D. E. Knox, Arnout Koch, J. A. Krawiecki, Krechimir Krnjevitch, Janet M. Lamont, J. A. H. Lee, Anne P. Lerpinière, Isabel J. Lim, J. A. Liver, M. D. W. Low, Elizabeth Y. McDonald, Morag S. Macdonald, Beryl B. MacKenzie, W. A. N. Mackie, Sheila L. McKinlay, I. F. MacLaren, Catherine M. U. MacLean,§ D. W. MacLean, Edith M. McLean, J. D. F. McLean, K. F. M. MacLennan, T. J. McNair, D. M. MacPhee, D. M. McSwan, Findlay Malcolm, Annie B. Mann,§ Helen F. Martin, G. H. Matheson, J. H. M. Miller, J. L. Miller, V. G. Milne, C. J. Morris-Mancor, Winifred A. Morton, Helen M. C. Mowat, Catherine R. Munnoch, J. H. Neill, J. E. Newsam, H. M. S. Noble, Bernard Nolan, Samuel Emmanuel Nii-Amu Otoo, J. A. Owen, Rosemary E. T. Philp, Hilary R. Pullon, Helen M. Roberts, A. D. Robertson, Elizabeth MacK. Ross, Joan M. Russell, Helen H. Scott, H. G. Seed, R. L. Simpson, Krystyna M. Slawinska, Lesley D. Smith, J. S. Stark, Thomas Stevens, Sheila M. Stewart, I. B. Sutherland, H. B. Torrance, Dorothy I. Troup, Margaret A. Tubbs, G. McD. A. Turner, W. B. Vallance, I. R. Verner, Pearl A. Walker, Edith J. Warner, Phœbe M. White, John McA. Williams, C. W. M. Wilson, D. I. T. Wilson, Janet W. Worling, Mary E. S. Wylie, Gerard Young, Robert Yule.§

B.Sc.—Andrew MacFarlane (second-class honours).‖

D.P.H.—R. S. F. Adam, Eustace Akwei, K. H. Black,‖ Jean A. Gemmell, D. W. Horn, J. A. Leitch,‖ J. P. Sexton, Lotar Sheldon, J. L. Watson.‖

D.I.H.—Walter Bolliger, W. H. Graham,‖ Ashit Kantha Niyogi.

D.T.M. & H.—Mary A. Ashton, Mark Davey-Hayford, A. H. Dunnett, Somesh Chandra Ghosh, P. M. Kirkwood, Syed Abdul Mannan, Robert Park, J. M. U. Philip, Shih-Wen Wang.

D.M.R.D.—Agnes M. Macgregor, John Mackenzie, C. D. Preston, D. F. Ross.

D.M.R.T.—J. D. Crowley, John Milligan.

M.D. of the Polish School of Medicine.—Bronislaw Rozenblat, Stefan Grzybowski, Jerzy Klimczynski.

M.B., Ch.B. of the Polish School of Medicine.—J. S. Biskupski, Konstanty Maksimczyk, Alicja Lubicz-Sawicka, Aniela Szwede, Leon Buczek, Antoni Chrzaszcz, Cezary Cywinski, Jadwiga Dabrowska, Danuta Graczyk, Kaz [illegible] Kawa, Alina Klosowska, Gertruda [illegible] Tadeusz Krzyski, Wanda Kucha [illegible] Michal Matuszewski-Topor, Ludwika Sawicka, Bronislaw Skibinski, Marja Starczewska, J. F. Witek,

* Awarded medal for thesis.
† Highly commended for thesis.
‡ Commended for thesis.
§ With honours.
‖ In absentia.

The Cameron prize in practical therapeutics was awarded to Mr. Daniel Bovet, D.SC., director of the Istituto Superiore di Sanità, Rome, in recognition of his work on anti-histamine drugs.

University of Manchester

Dr. R. F. L. Logan has been appointed part-time lecturer in occupational health, and Mr. John Miller, B.D.S., lecturer in children's dentistry and preventive dentistry.

Royal College of Physicians of Edinburgh

At a meeting held on July 19 with Dr. W. D. D. Small, the president, in the chair, the following were elected to the fellowship:

D. E. Sands (Sutton), A. W. S. Thompson (Auckland, N.Z.), C. F. J. Cropper (Worcester).

Diplomas of membership were conferred on the following:

R. G. Lendrum, J. I. Lipschitz, R. W. D. Turner, R. M. M. Hunter, A. C. S. Iyer, A. P. Littlewood, W. Gordon, Muriel M. D'Souza, B. E. Cohen, J. H. Taylor, J. O. Craig, J. W. Farquhar, K. Rhaney, G. Mundel, D. Cappon, T. C. Noble, F. W. A. Turnbull, J. S. Calder, R. T. Ritchie, R. S. Walker, A. B. Sclare, J. D. Matthews.

Heberden Society

This society held its annual meeting at Oxford on July 15 and 16, when the Heberden Round was taken at the Radcliffe Infirmary by Dr. Sidney Truelove in the absence of Prof. L. J. Witts. Seven cases were presented for discussion by Dr. Truelove and members of Professor Witts's unit.

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Aug. 2, at 4.30 P.M., in the anatomy lecture-theatre of the university, Prof. John McMichael will speak on the Principle of Venous Pressure Reduction in the Treatment of Heart-failure.

Payment of Part-time Consultants

A Ministry of Health circular (R.H.B. [49] 100) makes it clear that a part-time consultant who enters into contract with more than one regional board or board of governors, is to be treated, for the purpose of determining total remuneration, as though all his services were rendered under a single contract.

Appointments at Italian Sanatoria

Temporary appointments at the Forlanini Sanatoria in Rome and Naples are offered by the Instituto Nazionale della Previdenza Sociale to doctors from other countries who wish to study Italian methods of treating tuberculosis. Successful candidates will receive full board and lodging but they must find their own return fares and pocket money. Applications should be sent to the controller, education division, British Council, 3, Hanover Street, London, W.1.

World Health Organisation

Less than a week after the end of the second World Health Assembly in Rome the executive board of W.H.O. met at Geneva to implement the decisions taken at the assembly. For instance, the board authorised the director-general, Dr. Brock Chisholm, to negotiate for voluntary contributions to implement the supplemental operating programme for 1950, which is a part of the United Nations scheme for technical assistance to underdeveloped regions.

The board also authorised the director-general to establish a regional organisation for Europe, after obtaining the consent of the majority of European member states, and to establish a regional office and to appoint a regional director on the basis of recommendations of the regional committee and after approval from members of the board obtained by correspondence.

Poliomyelitis in the United States

At an emergency meeting recently called by the U.S. National Foundation for Infantile Paralysis and reported by British United Press, Mr. Basil O'Connor, president of the foundation, said that 37 States had already reported a considerable increase over the number of poliomyelitis cases last year, which was the worst for more than thirty years. In the week ending June 25, notifications numbered 409, making this year's total 2718: the corresponding figures at the same time last year were 309 and 2006 respectively. Since 1944 the average number of cases of infantile paralysis had risen by about 9000 annually. Mr. O'Connor disclosed that the foundation, using accumulated reserves, had spent more than $4,500,000 above the amount received in contributions last year. An emergency campaign for "epidemic funds" might be needed; for the only alternative would be a curtailment of the foundation's research programme.

R.A.F. Medical and Dental Branch Dinner

The annual dinner will be held at the Dorchester Park Lane, London, W.1, on Friday, Dec. 2. F particulars will be found in our advertisement columns.

International Nomenclature of Drugs

The World Health Organisation is to formulate a international nomenclature for new habit-forming and drugs. This action is being taken because of confusion by the same drug being marketed under more than one

Alvarenga Prize

The College of Physicians of Philadelphia have the Alvarenga prize for 1949 to Dr. O. H. W professor of surgery in the University of Minnesota, contributions to the ætiology and therapy of gastri duodenal ulcer.

Manchester Pædiatric Club

The fifth meeting of this club took place on July 18, Dr. Alton Goldbloom, professor of pædiatrics at University, delivered an address on Pitfalls in Diagnosis. The second annual general meeting will b on Sept. 27.

Ministry of Food

Mr. Morley T. Parry, chief sanitary inspector, Nor county borough, has been appointed food hygiene ad officer at the Ministry. His duties will include visiting authorities and advising them, and he will work und direction of Dr. W. A. Lethem, the Ministry's medical officer.

Society of Chemical Industry

The food group of the society is holding a symposiu Amino-Acids and Protein Hydrolysates on Sept. 28 in the Senate House of the University of London, Prof. E. C. Dodds, F.R.S., will give the opening addr 6 P.M. on the 28th. Other speakers will include I Neuberger and Dr. D. P. Cuthbertson. Further parti may be had from the secretary of the society, 56, Vi Street, S.W.1.

CORRIGENDUM: *Reduviid Bugs.*—Commenting on note of May 14 (p. 847), Dr. Petr Wygodzinsky, aut the Argentine monograph we were reviewing, points ou Chagas's disease is not transmitted by the bite of the tria but through their dejecta which are rubbed in the ey enter the skin through small wounds.

Appointments

ADAMS, J. C., M.D. Lond., F.R.C.S.: part-time orthopædic su St. Margaret's Hospital, Epping.

JUSTICE, J. J., M.B., B.SC. Glasg., D.P.M.: deputy medical su tendent, St. Mary's Hospital, Stannington.

MCNAB, G. R., M.D., B.SC. Edin., F.R.C.P.E.: physician sa [illegible] natorium.

[illegible] M.B. Lond., M.R.C.P., D.C.H.: con [illegible] h area.

[illegible] M.B. Dubl., F.R.C.S.E., D.O.M.S.: par Chase Farm Hospital, Enfield.

[illegible] Lond., M.R.C.P.: consultant phy Ipswich area.

ROBINSON, J. B., M.D. Lond., M.R.C.P.: chest physician, Hartlepool and southern part of Durham County.

WRIGHT, P. S., M.B. Birm., M.R.C.O.G.: asst. obstetrician gynæcologist, Oldchurch Hospital.

Colonial Service:

ANDERSON, N. E. W., M.B. St. And., D.P.H., D.T.M. & H.: director of medical services, Nigeria.

BANNERMAN, H. S., M.B. Edin.: M.O. (African), Gold Coast

BRAINE, G. I. H., M.B. Edin., D.T.M. & H.: administrative superscale grade B, Federation of Malaya.

CANHAM, PAMELA, M.B. Lond.: lady M.O., Gold Coast.

CHAN, L. F., M.B. Glasg., D.T.M.: M.O., grade A, Trinidad.

COVELL, K. J., M.R.C.S.: M.O., Tanganyika.

CURRID, P. G., M.A., M.B. Aberd., D.P.H.: administrative superscale grade A, Federation of Malaya.

HARRISON, W. C. B., L.R.C.P.I., D.P.H.: senior M.O., Nor Rhodesia.

KULESZA, W. S., M.B. Polish School of Medicine: St. Vincent.

MCMAHON, J. E., B.A., M.B. Dubl., D.T.M. & H.: administ M.O., superscale grade B, Federation of Malaya.

MENZIES, G. M. M., M.B. Aberd.: asst. director of services, Nigeria.

SELBY, F. L. G., M.R.C.S.: asst. director of medical ser Nigeria.

[illegible] S., D.T.M.: M.O., Tanganyika.

[illegible], M.B.E., Med. Dip. Warsaw: a M.O., Grenada.

RONIC AND UNEXPLAINED ŒDEMA

A. G. W. WHITFIELD
M.B. Birm., M.R.C.P.
STANT PHYSICIAN, UNITED BIRMINGHAM HOSPITALS;
RER IN MEDICINE IN THE UNIVERSITY OF BIRMINGHAM

W. MELVILLE ARNOTT
)., B.Sc., M.D. Edin & Birm., F.R.C.P.E., M.R.C.P.
IAN TO THE HOSPITALS; PROFESSOR OF MEDICINE
IN THE UNIVERSITY

RONIC œdema of the lower extremities occurring ut any apparent cause must be within the experi- of all general physicians and will probably have encountered by the majority of general practitioners.

ote et al. (1940) investigated 100 consecutive ients and 100 consecutive outpatients with varying es of œdema of both legs, and in 2, both of whom outpatients, no cause could be found. Of the ining 198 all but 4 were due to cardiac failure, renal se, obesity, varicose veins, hypoproteinæmia, myx- na, rheumatoid arthritis, bilateral femoral throm- , hepatic cirrhosis, postural causes, or lymphatic or us obstruction by malignant or leukæmic disease. other 4 were attributed to chronic lymphatic obstruc- resulting from recurrent overt lymphangitis and hadenitis associated with epidermophytosis.

the "Questions and Answers" column of one issue e *British Medical Journal* (1947) three practitioners aled for help in diagnosis and treatment of cases of nic bilateral œdema of the legs for which they could no adequate explanation. In the answer all were nosed as lymphœdema, and unnoticed attacks of hangitis, possibly due to epidermophytosis, were ulated as the cause of the lymphatic block. Lymph- ma is the usual label attached to such cases, and gh it may often if not always be a factually correct nosis it will be generally agreed that "chronic and plained œdema" would be a more honest description re there have been no antecedent inflammatory odes in the legs. It would be better if the term phœdema were reserved for cases in which there is a history or in which some cause for lymphatic mmation or obstruction is present.

erusal of the literature suggests that chronic and xplained œdema though not common is not excessively , and as nine such cases have recently been under our we thought it might be of value to record our rvations regarding their clinical features. The ression that we have gathered from the patients we have personally observed and from the numerous lications on the subject is that at least four types t.

CHRONIC HEREDITARY ŒDEMA

he first, most definite, and most widely recognised is chronic hereditary œdema or Milroy's disease, or Nonne-Meige-Milroy disease.

ttention was first called to the condition by Nonne 1) who described four cases occurring in two genera- s of a family and mentioned five near relatives who e similarly affected. In the next year Milroy pub- ed his well-known paper recording twenty-two cases rring in six generations of a family of ninety-seven roy 1892), and later he added two more to the cted members of this family and his follow-up hasised the benignity of the condition (Milroy 1928). ge (1899) described eight cases in four generations of amily, and Rolleston (1902) drew attention to the dition for the first time in the English literature. rding three cases in a family of eight. Since then pe and French (1907), McGuire and Zeek (1932), kes Weber and Schluter (1937a), Braham and Howells (1948), and numerous others have described further cases.

Either sex may be affected by this type of œdema which appears to be handed down as a mendelian dominant. The age of onset of œdema is variable: in twenty-one of the original twenty-two cases described by Milroy (1892) it commenced at birth, but in the majority of the other recorded cases it appeared at puberty. A few have commenced in early adult life and Ellis and Hall (1933) record two that developed during pregnancy.

Both legs are usually involved, but the œdema is sometimes not symmetrical and it may be confined to one limb. It commences round the ankle and lower calf and increases and extends proximally over a period of years after which it remains stationary. Usually the knee or Poupart's ligament are sharp upper limits for the œdema, but Richards (1931–32) has recorded an instance in which all extremities were involved and œdema of the face and hands occurred in one of the cases described by Ellis and Hall (1933). At first the œdema pits readily, but as years go by it gets firmer and pitting becomes less evident. The fact that the condition does not reduce longevity is stressed by all writers and Milroy's (1928) follow-up leaves no doubt on this point.

Drinker and Field (1933) produced artificial lymphatic obstruction in the legs of dogs and showed clearly that these animals were unduly prone to streptococcal infections in the œdematous limbs. This is probably the explanation of the "acute attacks" described by Hope and French (1907), McGuire and Zeek (1932), and Ellis and Hall (1933). These attacks, which tend to be recurrent, are always self-limiting and usually last about four days. They are characterised by increased swelling of the limb, and localised pain, redness, and tenderness, together with pyrexia and considerable constitutional upset. They have always developed long after the onset of the œdema. Apart from the occasional occurrence of such "acute attacks," the condition never causes any disability except for the weight and unsightliness of the affected limbs.

Opinion regarding the effect of pregnancy on this type of œdema varies. Hope and French (1907) state that it produces no alteration, but in a case recorded by Parkes Weber and Schluter (1937b) it was temporarily increased during each of five pregnancies, and as stated above two of Ellis and Hall's (1933) cases developed during pregnancy.

The œdema always subsides to some extent with rest and is aggravated by physical activity.

As regards treatment, the wearing of elastic stockings and sleeping with the foot of the bed raised are useful therapeutic procedures, but Kondoleon's operation has occasionally been carried out with some benefit. Thyroid, digitalis, and mercurial diuretics have often been tried, but none of them bring about any improvement.

The underlying abnormality causing the œdema in this hereditary group remains unknown. Many hypotheses have been put forward, and an attractive explanation postulates a congenital varicosity or other anomaly of the lymphatics. McGuire and Zeek (1932) examined biopsy and Kondoleon operation specimens from one of their cases but found no striking abnormalities apart from œdema and fibrosis. They found exactly similar changes in post-mortem specimens from cases of cardiac and other forms of œdema.

Two of our nine cases (nos. 8 and 9) belong to this group. In one (case 8) the leg swelling began to develop in middle life, which is unlike any other recorded case of hereditary œdema; but the fact that a brother was similarly affected suggests that the patient's œdema is of the true Milroy type. When she was first seen the œdema had been present for some years and pitted poorly: her hands were also involved to a lesser degree. A notable feature was the marked increase in her œdema which occurred in association with a general increase in body-weight during the year before she was seen. She has recently had an attack of erysipelas in one of her legs. The other patient (case 9) corresponds exactly to Milroy's description. The œdema was present at birth and when the child was seen by us at the age of ten there was no other physical abnormality and there had never been any disturbance of general health. Her paternal grandfather, now aged 65, and her paternal aunt, aged 40, have both had swollen legs since birth but neither has had any disability from this source, and both have led full and active lives.

CHRONIC ŒDEMA OF MILROY TYPE WITHOUT HEREDITARY ELEMENT

Rolleston (1902) in his paper refers to a woman of 24 with chronic œdema of the legs for which no explanation could be found and in which there was no hereditary element, and Parkes Weber said he had seen several such cases (Parkes Weber and Schluter 1937a). Homans (1933) terms them "sporadic non-filarial elephantiasis" and states that "acute attacks" never occur in this condition.

Three of our nine cases (nos. 1, 2, and 3) appear to belong to this group. All are females, and œdema commenced at 37 in case 1, 33 in case 2, and 17 in case 3. None of the previously recorded cases of chronic hereditary œdema appear to have commenced as late as the fourth decade. In each of our three cases the œdema is symmetrical and does not extend above the knee, but *case 2 had swelling of the arms and face for a period of* two weeks in 1946 and case 3 had swelling of the arms and face during a pregnancy which also produced a marked increase in the leg œdema. After delivery, however, the œdema of the face and arms subsided and that of the legs reverted to its usual mild degree. During the pregnancy there was no albuminuria, hypertension, or headache to suggest that toxæmia played any part in the aggravation of the œdema. In case 2 the œdema never disappeared after it first began to develop, but in case 1—a patient with a somewhat sedentary occupation—a most unusual feature was that a mountaineering holiday in Wales caused the œdema to disappear temporarily and a *walking holiday the next year also* produced considerable diminution in the swelling. In case 3, despite its long duration, the œdema has always been intermittent.

In two of the patients the subcutaneous tissues of the lower legs were tender and had a lobulated texture, and the skin of the anterior aspect particularly on the lateral side was reddened. In all three cases the œdema pitted fairly well. In none of the three was there any other relevant physical abnormality, and no family history of œdema, nor any personal or family history of allergy, could be obtained. *All the patients found that the* œdema was worse at the end of the day and less when they got up in the morning.

The duration of the œdema was 4 years in case 1, 13 years in case 2, and 22 years in case 3. All three patients are leading a full and normal life; one is a commercial artist and two are employed in a secretarial capacity.

With regard to treatment, two are wearing elastic stockings and sleeping with the foot of the bed raised, and these measures produce some improvement. The third case is not sufficiently severe to require treatment. 'Benadryl' was tried in two cases and 'Anthisan' in one, but neither produced any improvement. Thyroid was also given to one of the patients and mercurial diuretics to another, but these had no beneficial effect.

CHRONIC ŒDEMA ASSOCIATED WITH ALLERGY OR RESPONSE TO ANTI-HISTAMINE DRUGS

In two of the patients that we have observed
may be a factor in the causation of the œdema.
(case 4) was a woman who had suffered from asth
mittently throughout life and who also from time t
had pitting œdema of both ankles and lower
The œdema caused no disability and no cause for it
be found. It showed marked periodicity; there
no sign of it for several years and then it would
and persist for weeks or months. She has not
seen since anti-histamine drugs have been a
but on the one occasion when she sought advice re
her œdema it showed some response to ephedrine.

The second patient (case 5) is a woman, now
who had suffered from persistent œdema of the
face and hands for 16 years. She gave no person
family history of allergy but she suffered from
vasomotor flushing of her face and neck. Exhau
investigations revealed no cause for her œdema and
was given a course of T.A.B. injections as an emp
measure without benefit. When next seen she said
she had consulted another physician who had diag
"asthma of the blood" and prescribed benadryl, w
had produced striking and unequivocal improveme
her œdema though it had never completely disappe
This physician said that he had seen several similar
and it appears likely that a small number of ca
chronic and unexplained œdema are allergic in
and might appropriately be termed "a fixed typ
angioneurotic œdema."

Salvesen and Boe (1937) described a woman o
who had been a lifelong sufferer from asthma and
developed œdema of the legs, face, and back togeth
ascites and a right pleural effusion one year before
publication. No cause for this œdema could be found
it showed no response to thyroid, 'Salyrgan,'
vitamin B, or œstrin. They did not try ephedrine.

LIPŒDEMA

Allen and Hines (1940) described five cases of chr
œdema of the legs which they termed "lipeder
All the patients were female and had had generalised
symmetrical enlargement of the legs since girlhood. T
enlargement was due to an unusually large amount
fat in the buttocks, thighs, and legs; its causation
obscure but heredity seemed to play a part. Th
writers, quoting Youmans et al. (1934, 1935), suggest
the major factor in the production of œdema in su
cases is the excess of fat in the subcutaneous ti
of the legs, which produces a lack of tissue tone allowi
an excessive diffusion of fluid from the blood into th
extravascular spaces before the extravascular h
pressure rises sufficiently to prevent further loss of
from the capillaries. Pitting œdema was never
striking and was usually evident only towards the en
the day, particularly during hot weather and a
standing. Aching in the legs in the latter part of
day was a constant feature and the legs below the
were *sensitive to pressure and to pinching.* Allen
Hines (1940) pointed out that the condition did
reduce expectation of life or interfere with general hea
and the only treatment possible consisted in effort
reduce weight, massage, and the wearing of el
stockings.

Two of our cases (nos. 6 and 7) belong to this
Both *patients were females* and had had the cond
since adolescence. It had caused no inconveni
apart from the aching it produced in the latter
the day. One of them often had to retire to bed
or put her feet up on a chair in the evenings in
relieve this symptom, and while she was serving
the W.R.N.S. in the Middle East it became so distre
that she had to be invalided home. Both the pati

eriously distressed by the unattractive appearance r legs and there is no doubt that this as well as the led them to seek medical advice. Though there gross excess of subcutaneous fat in their calves highs, neither patient showed any evidence of lised obesity and no other members of their es had fat legs.

in the cases of Allen and Hines (1940), pitting a was never gross; it was always confined to the and lower calf and was usually evident only towards d of the day, especially when the weather was hot y had had to stand for long periods. Tenderness skin and subcutaneous tissues of the legs on pressure inching was a conspicuous feature, and both patients d redness and crazy-pavement-like scaliness of in on the anterior and lateral aspects of the lower

patient had two pregnancies without aggravation leg swelling.

wearing of elastic stockings and sleeping with the f the bed elevated were of some value in controlling ng in both cases; but neither massage nor thyroid ced any improvement, and anti-histamine drugs were tried in one case had no beneficial effect.

DISCUSSION

e tendency to describe all cases of chronic œdema hich no cause can be found as lymphœdema is to precated.

do not doubt that a proportion of such cases are to actual acquired lymphatic block, but in the ice of any history of lymphangitis or lymphadenitis, any possible provocative lesion such as epidermo-osis, and especially if the œdema is symmetrical, a mechanism seems unlikely, and the occurrence ansient or persistent œdema of hands and face in cases clearly indicates that all cannot be so ined. In none of the nine cases that we have observed there anything to suggest acquired lymphatic block. t then is the explanation of the œdema?

possible explanation of the lipœdematous group at these females develop during adolescence an ity which is localised to the lower extremities, and excess of subcutaneous fat in the legs produces static œdema as a result of lack of tissue tone. may be regarded as similar in nature to the cases neralised obesity in which leg œdema is so often seen. they should develop an excess of subcutaneous fat eir legs at adolescence is uncertain, but probably an inherited trait. That another, probably small, p of cases of chronic and unexplained œdema may llergic in origin seems likely, though we have not proved this to our own satisfaction. As regards nic hereditary œdema, the published cases leave no t that the cause lies in some inherited defect, gh the exact nature and site of this abnormality ins a matter for speculation; and why the œdema ld so often develop at puberty or later is difficult to rstand. It seems possible that the similar cases out any hereditary element have the same patho- as the Milroy type, for their manifestations are so much alike; but if this is so it is hard to explain tendency for the non-hereditary cases to develop in life.

rkes Weber and Schluter (1937b) published two of chronic œdema associated with hypertension. do not think that this comprises another group, for case was hypoproteinæmic and the other was clearly se of chronic hereditary œdema. The hypertension ars to have been purely coincidental.

l our patients found that their œdema was worse he end of the day, and was aggravated by standing and hot weather and improved by rest. Some also noted an increase in their swelling before menstruation. These features are not to be regarded as peculiar to the disorders we have described, for they are characteristic of all œdematous states. We can offer no explanation for the temporary improvement which occurred in case 1 apparently as a result of increased physical activity.

In two of our cases (nos. 3 and 4) the œdema was intermittent, but in all the others it was persistent; and after it had been present for some years it showed a tendency to become firmer and to pit less readily on pressure. This is thought to be due to fibrosis in the subcutaneous tissues and is not regarded as a characteristic of any particular group of cases but merely as the natural result of any chronic œdematous state. This fibrotic change gives the subcutaneous tissues a lobulated feel and makes them tender to pressure. The tenderness on pressure and pinching is particularly noticeable in cases of lipœdema, and this together with the aching in the legs which these patients experience suggests that the excess of fat may aggravate the tendency to fibrosis. It is in some ways reminiscent of Dercum's disease.

The tendency for the skin of the anterior and lateral aspects of the lower leg to become reddened and scaly, seen in our cases of lipœdema, was also present in some of our other cases and is probably an anoxæmic effect on the skin akin to varicose eczema and erythrocyanosis and not confined to lipœdema. A layer of œdematous tissue tends to insulate the skin from the warmth of the underlying vascular muscle.

We have little that is constructive to offer for the treatment of these cases. Elastic stockings and sleeping with the foot of the bed raised usually produces slight improvement. Massage seems to have so little effect that it is not worth the time and effort that it involves. Thyroid, digitalis, and mercurial diuretics are without any value, and it is doubtful whether Kondoleon's operation is ever justifiable in any of the four types of œdema that we have described, though in true obstructive lymphœdema it may occasionally produce real improvement. We believe that there is a group in which allergic mechanisms with histamine release may play a part, and anti-histamine drugs are always worth a trial, especially if there is an allergic background.

CASE DETAILS

Case 1.—Female, aged 41. Commercial artist. No significant previous illness and no personal or family history of allergy. No family history of œdema. Increasing painless symmetrical œdema of legs for four years, worse at the end of the day, after standing, in hot weather, and before and during menstruation. A mountaineering holiday in Wales in 1946 caused œdema to disappear for two weeks and a walking holiday in 1948 produced marked temporary diminution in swelling. Examination showed symmetrical below-knee œdema which pitted well. Skin of anterior and lateral aspects of lower legs reddened and scaly during winter months. Subcutaneous tissues in œdematous areas feel lobulated and are tender. No other physical abnormalities found. Urine free from albumin and sugar and no abnormality on microscopic examination of the spun deposit.

Radiography of the chest: no abnormality of the heart or lungs. Electrocardiogram: physiological. Blood-count: red cells 4,690,000; hæmoglobin 11·3 g. per 100 ml.; white cells 7500 with normal differential count. Blood chemistry: urea 33 mg., albumin 4·8 g., globulin 2·3 g., sodium 326 mg., chlorine ion 368 mg., and total cholesterol 265 mg. per 100 ml.

No response to thyroid, vitamin B_1, calcium, benadryl, or anthisan. Slight improvement with elastic stockings and sleeping with the foot of the bed raised.

Case 2.—Female, aged 46. Secretary. No personal or family history of allergy and no family history of œdema.

Partial thyroidectomy for thyrotoxicosis in 1938. Increasing bilateral painless symmetrical œdema of both legs since 1936. Arms and face swelled for two weeks in 1946. Leg swelling worse at the end of the day, but improved by rest. Examination showed firm symmetrical œdema below the knees on both legs which pitted only moderately well. Skin of lower legs reddened and subcutaneous tissues of lower legs lobulated and a little tender—quite unlike pretibial myxœdema (Trotter and Eden 1942). Exophthalmos still present but no other evidence of thyrotoxicosis or other physical abnormality. Urine free from albumin and sugar and no formed elements microscopically.

Radiography of heart and lungs: no abnormalities. Radiography of legs: trabeculated subcutaneous soft tissue swelling but normal bones. Electrocardiogram: physiological. Blood-count: red cells 5,110,000; Hb 14·1 g. per 100 ml.; white cells 9100 with normal differential count. Basal metabolic rate + 24%. Wassermann reaction—negative. Blood chemistry: urea 25 mg., albumin 3·9 g., globulin 2·3 g., sodium 330 mg., and total cholesterol 246 mg. per 100 ml.

No response to benadryl or mercurial diuretics. Slight improvement with elastic stockings and sleeping with the foot of the bed elevated.

Case 3.—Female, aged 39. Secretary. No personal or family history of allergy. No family history of œdema. No significant previous illness. Bilateral ankle œdema for a few days about twelve times a year since the age of 17. During pregnancy in 1946 ankles, face, and arms became persistently swollen; swelling disappeared after delivery, and leg œdema reverted to its previous state. Examination showed slight œdema of both ankles which pitted well. Urine specific gravity 1020. No albumin or sugar and no microscopic abnormality.

Urea-concentration test 2·3%, 3·0%, and 3·0%. Blood-count: red cells 4,000,000; Hb 10·8 g. per 100 ml.; white cells 8950 with normal differential count. Blood chemistry: urea 33 mg., albumin 4·2 g., globulin 2·2 g., cholesterol 287 mg., sodium 326 mg., chlorine ion 373 mg., calcium 11 mg., and potassium 20·5 mg. per 100 ml.; alkaline phosphatase 3·5 units. Liver-function tests normal. Œdema not sufficiently severe to require treatment.

Case 4.—Female, aged 46. Housewife. Lifelong history of intermittent asthma. No other significant illness. No family history of œdema. Painless symmetrical ankle œdema for periods of weeks or months throughout life. Apart from moderate œdema of ankles and lower calves which pitted well, no physical abnormality. Urine free from albumin and sugar and no microscopic abnormality. On the one occasion when she sought advice on account of her œdema it gradually disappeared with ephedrine gr. $^1/_2$ t.d.s.

Case 5.—Female, aged 38. Housewife. No family history of œdema. No personal or family history of allergy. Œdema of right leg since 1933 disappeared for a year after a pregnancy in 1935. Left leg became swollen in 1936 and hands and face in 1937. All swelling disappeared for six months after pneumonia in 1942. Œdema worse at the end of the day and before menstruation; goes down a little during the night. Examination showed marked vasomotor flushing of face and neck, firm symmetrical œdema of both legs which pitted poorly, and œdema of wrists, face, and conjunctivæ. No other physical abnormality. Urine free from albumin and sugar; specific gravity 1015. No microscopic abnormality in the spun deposit.

Radiography of heart and lungs showed no abnormality; neither did a skull X ray. Basal metabolic rate + 10%. Blood-count: red cells 4,740,000; Hb 13·3 g. per 100 ml.; white cells 10,850 with normal differential count. Blood chemistry: urea 40 mg., albumin 4·0 g., globulin 2·8 g., total cholesterol 275 mg., sodium 300 mg., chlorine ion 371 mg., and potassium 23·5 mg. per 100 ml. Urea-concentration test 3·5%, 2·9%, and 1·6%. 17-keto-steroids 1·2 mg. in 24 hours. Erythrocyte-sedimentation rate 20 mm. at 1 hour (Wintrobe).

No response to mercurial diuretics, salt-free diet and restricted fluids, or to T.A.B. injections. Marked response to benadryl.

Case 6.—Female, aged 34. Housewife. No personal or family history of allergy. No family history of œdema or of fat legs. Very fat calves and thighs aching and becoming œdematous round the ankles towards the end of the since puberty. Hot weather and standing aggravate swelling and pain. Examination showed gross inc subcutaneous fat of calves and thighs which were and felt lobulated. Pitting œdema round the ankles in evenings. Skin of anterior and lateral aspect of lower reddened and scaly. No generalised obesity and no physical abnormality.

Urine normal. No increase in leg swelling during pregnancies. No response to thyroid. Elastic b controlled swelling to some extent.

Case 7.—Female, aged 38. Secretary. Eczema asthma as a child. No other significant illness. M had eczema and a brother has hay-fever. No family of œdema. Since the age of 17 has had fat legs with and ankle œdema towards the end of the day, es if she stands a lot and in hot weather. When serv the W.R.N.S. in Middle East aching and swelling so that she had to be invalided home. Often has to go to early or sit with feet on a chair in the evenings of the aching. Examination showed gross excess of cutaneous fat in calves and thighs which was tende pressure and felt lobulated. Moderate pitting œdema ankles at the end of the day. Skin of lower legs red "crazy pavement" scales on anterior and lateral No other physical abnormality. Not generally obese. free from albumin and sugar and no microscopic abno

Radiography of heart, lungs, and legs normal. E cardiogram: physiological. Basal metabolic rate – Urine-concentration test 1005, 1010, 1025. Blood-cou red cells 4,080,000; Hb 11·8 g. per 100 ml.; white 5300 with normal differential count. Erythrocyte-sed tation rate 6 mm. at 1 hour (Wintrobe). Blood chem urea 27 mg., uric acid 2·8 mg., creatinine 1·8 mg., alb 4·0 g., globulin 1·6 g., total cholesterol 297 mg., 337 mg., chlorine ion 375 mg., calcium 11·8 mg., and phorus 2·3 mg. per 100 ml., alkaline phosphatase 3·2 Liver-function tests normal.

No response to anthisan, benadryl, thyroid, or ma Elastic stockings and sleeping with the foot of the bed produced slight benefit.

Case 8.—Female, aged 48. No personal or family hi of allergy. Venous thrombosis of left leg in 1929 follo a blow from a tennis racquet. Always suffered from hypersensitivity and a tendency to chilblains on the Menopause at 42. For some years increasing painless metrical œdema of legs which had been markedly wors the past year in which she had put on much weight. Lat the hands have also been swollen to a lesser degree. swelling worse at the end of the day and reduced by re bency. Recent attack of erysipelas in one leg. Examin showed symmetrical œdema of both legs which pitted and did not extend over the knees. The hands were swo but no pitting was evident. Physical examination wa otherwise negative. The urine was free from albumin and sugar.

Wears elastic stockings with slight benefit. A brother is similarly affected but no other family history was obtainable

Case 9.—Female, aged 10. No personal or family hist of allergy. Paternal grandfather now aged 65 and pat aunt now aged 40 have had swollen legs without disturb of general health since birth. Patient's legs were s at birth and have remained so since. Worse at the end the day and in hot weather. Go down a little during night. Never any œdema of any other part of the No other symptoms, never any illness. Physical examin revealed bilateral symmetrical œdema of the legs exten to just below the knees. Marked pitting; no skin cha and no tenderness or lobulation of subcutaneous tis Heart, abdomen, and urine normal and no other phy abnormality.

Had had much massage which produced slight but tra improvement.

SUMMARY

Nine cases of bilateral œdema of the legs not due any of the common causes are reported and discussed.

We are indebted to Prof. P. C. P. Cloake for refe case 9 to us.

References at foot of next page

NSERVATIVE TREATMENT OF ANURIC URÆMIA

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HE prognosis of anuric uræmia can be improved by treatment outlined below. For the past two years have investigated this type of uræmia and studied 30 patients with more than four days' anuria each. ur interest was originally stimulated by the develop- t by Kolff of an artificial kidney (Kolff and Berk), and in the early stages the accent was on the oval of retained substances after the full clinical ure of uræmia had appeared (Bywaters and Joekes , Joekes and Bull 1948). More recently, as a lopment of the dietetic control method of Borst 8) and its combination with the control of water nce as advocated by Lattimer (1945) and others, have tried to prevent the development of the classical ical picture of uræmia.

CLASSIFICATION

roadly speaking, there are two types of uræmia m the therapeutic point of view: one in which the ney can excrete water but cannot maintain a normal *ieu intérieur* without special management; the other which negligible quantities of water are excreted. s this latter group, the anuric uræmias, with which are primarily concerned, and its particular importance that a large proportion of patients may recover pletely.

TREATMENT

resented with a case of anuria, one should first lude any obstruction which is distal to the renal vis and needs surgical intervention. Secondly, factors side the kidney, such as general circulatory distur- ces and alkalosis, which themselves may produce al failure, should be recognised and, if possible, ected. All other cases, including those which have responded to the correction of extrarenal factors, treated along the lines indicated below.

PROGNOSIS

ecovery to a level of renal function adequate for health be expected in the following groups.

(1) *Lower-nephron nephrosis*, including the types following mismatched blood-transfusion, crush syndrome, intravascular hæmolysis from various causes, post-abortion anuria, and the lesion following protracted "shock."

(2) *Toxic nephrosis*, including poisoning by mercury, carbon tetrachloride, phenol, &c.

(3) *Acute Nephritis.*—Complete recovery is possible in acute nephritis even where there is protracted oliguria or anuria with gross retention of nitrogen. Probably the mortality in the acute phase can be lessened if the patient can be tided over the oliguric period.

Recovery to a previous level of renal function may take place in any chronic renal lesion after an acute episode precipitated by infection of the urinary tract, exacerbation of the underlying lesion, or extrarenal causes.

Death may be expected in an anuric episode in a patient with malignant hypertension, bilateral cortical necrosis of the kidney, and Lohlein's stormy subacute nephritis. A patient with chronic nephritis which has steadily deteriorated to severe oliguria will also not recover.

PRINCIPLES OF TREATMENT

The pathogenesis of the various symptoms and signs of uræmia have been adequately dealt with by Harrison and Mason (1937) and Bradley (1948). From a study of our patients with anuric uræmia we have evidence to suggest that, at least in this condition, the following factors are the most important: Disturbances of water balance, disturbances of mineral balance, and disturbances of nitrogen balance.

Water Balance.—It has been suggested that water overload might play a part in the pathogenesis of uræmia. Many workers, including Lattimer (1945), Kugel (1947), Humphrey and Jones (1947), Thorn (1948), Coller et al. (1948), and Muirhead et al. (1948), have appreciated the importance of water balance, and Lattimer (1945) reviewing the treatment of 33 cases of urinary suppression, found that of patients given less than 2000 ml. of fluids a day none died, whereas of those given 3500 ml. or more 75% died. He sums up: "the body is not analogous to a tank into which water can be forced until it finally bursts out through the kidneys." Our own experience is in direct accord with this view. We have not seen a patient with anuric uræmia dying in under fourteen days who has not shown in life signs of water overload and at necropsy evidence of gross pulmonary or cerebral œdema. In anuric patients, in the absence of vomiting, water loss is limited to extrarenal routes—i.e., lungs, skin, and fæces. Under normal conditions this loss is 600–1000 ml. a day. We accordingly limit the fluid intake in anuric patients to 1000 ml. a day. Any vomiting must be dealt with as indicated below.

Mineral Balance.—Though electrolyte disturbances are significant, we consider that disturbances of water balance are of much greater importance. In the absence of diarrhœa and vomiting the body has no effective pathway for electrolyte excretion other than the kidney, and administration of electrolytes in anuria may lead to gross disturbances of electrolyte balance. Excess of potassium may cause sudden death from cardiac arrest (Hoff et al. 1941, Finch et al. 1946), and excess of sodium is probably harmful in other ways. We are uncertain of the importance of excess or deficiency of chloride and bicarbonate but find it impossible to correct anion deficiency without at the same time introducing excessive quantities of cation. All our cases of protracted anuria have had considerable disturbances of chloride and bicarbonate balance, but this has not prevented the onset of diuresis. For this reason our diet is electrolyte-free until diuresis starts, and no attempt is made, while

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DR. WHITFIELD. DR. ARNOTT: REFERENCES

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the patient is still anuric, to correct the electrolyte disturbances. During the diuresis accompanying recovery electrolyte loss may be considerable and must be replaced quantitatively.

Nitrogen Metabolism.—The end-products of protein katabolism other than urea are possibly toxic (Harrison and Mason 1937, Bradley 1946). Further, accompanying the breakdown of tissue and most protein-containing foods, potassium and possibly other toxic substances are liberated. For these reasons it is desirable to depress endogenous and exogenous nitrogen metabolism as far as possible. It has long been known that a high carbohydrate intake depresses endogenous nitrogen metabolism, and Borst (1948) has developed a diet for use in uræmia which takes advantage of this fact. The diet is nauseating by mouth, and we have found that it further increases the vomiting to which uræmic patients are liable. Borst has had excellent results in his Dutch patients, but in British patients, with the foodstuffs at present available here, we have been unable to exceed an intake of 1000 calories a day, and not infrequently the greatest possible intake has been 500 calories a day. For these reasons we have fed our patients through a permanently indwelling stomach-tube and have given 400 g. of glucose and 100 g. of fat a day in this way. This 2500-calorie protein-free and mineral-free diet can be taken with little discomfort for periods of up to three weeks.

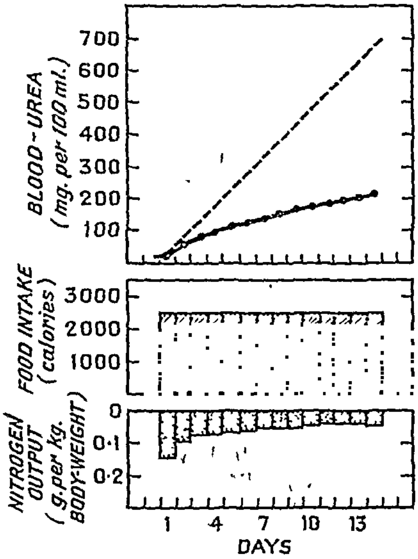


Fig. 1—Mean data on nitrogen metabolism in 5 controls: dotted line, usual rate of rise of blood-urea level in anuric patients not on régime; continuous line, rate at which blood-urea level would rise in anuric patients on régime, calculated by assuming retention of daily urinary nitrogen output.

SUMMARISED PROCEDURE

On admission of the patient to hospital a stomach-tube is passed through the nose. (Plastic tubes 2–3 mm. in diameter and without a bulbous tip have the advantages over the ordinary Ryle's tube that they are less irritating in the nasopharynx, are easier to pass, and, because of their slightly greater rigidity, are much more difficult to vomit out.) Through this tube the following mixture is dripped at a steady rate throughout the twenty-four hours:

Glucose ..	400 g.
Peanut oil ..	100 g.

Acacia q.s. to emulsify.
(Vitamins optional.)
Water to 1 litre.

All vomit is collected, filtered through lint and returned to the stomach in the same way. This ensures that the fluid intake is accurate, that there is no loss of food by vomiting, and that no loss of electrolytes occurs through vomiting. Serious disturbances of electrolyte balance during the anuric phase may be readily avoided by this régime.

By contrast, however, when diuresis starts, it with it special difficulties in management, beca electrolyte-regulating function of the kidney r slowly. Urinary losses of the various electrolytes be made good quantitatively, and, to the basic of 1 litre of water, fluid is added daily in a volume to the urine passed during the preceding twenty hours. It is desirable that the drip feeding shoul discontinued and superseded by a low-protein diet the urine output exceeds 1 litre a day.

Because anæmia is known to lead to diminished function, fresh packed red cells are transfused if hæmoglobin concentration is below 70%.

EFFECT OF RÉGIME

The effect of this régime has been examined in classes of patient: (1) controls with duodenal in whom there was no evidence of renal diseas disturbance of nitrogen metabolism; (2) patients reduced renal function but without anuria; and patients with anuric uræmia. Information on nitrogen, mineral, and water metabolism of t patients was obtained, and certain of the data presented. A detailed report will be published elsew

Controls without Renal Disease

Fig. 1 shows mean data on the nitrogen metab in 5 controls. The amount of urea excreted daily determined, and the total volume of body water in patient estimated from the body-weight. The ri concentration of urea in the body water resulting the addition to it of the daily urea output gives an mate of the height to which the blood-urea level rise if the patient had been anuric (Borst 1948).

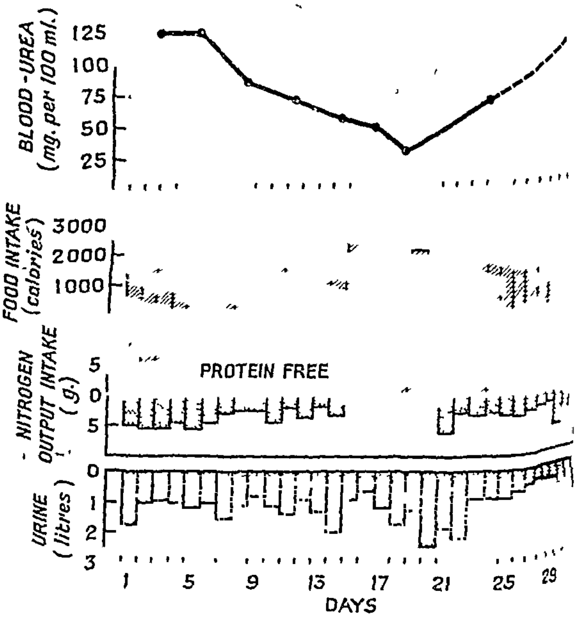


Fig. 2—Nitrogen metabolism in malignant hypertension: not rapid fall of blood-urea level on protein-free high-calorie and (2) its subsequent rise when 10 g. of protein containing 14. N_2 was given.

There was a rapid reduction of endogenous ni metabolism, as indicated by the steady diminu urea-nitrogen excretion to about 0·04 g. per kg body-weight a day. If these patients had been their blood-urea levels would have risen as slowly 17·7 mg. per 100 ml. a day during the first week 10·1 mg. per 100 ml. a day during the second In anuric patients not on this régime we have

RESULTS OF DIETARY RÉGIME IN URÆMIC OLIGURIA

Age ears)	Sex	Diagnosis	Duration of oliguria <300 ml. (days)	Day of 1-litre diuresis	Highest blood-urea level (mg. per 100 ml.)	Day of highest blood-urea level	Rise of blood-urea level (mg. per 100 ml.)		Day of death
							Before diet	On diet	
42	F	Lower-nephron nephrosis (mismatched blood-transfusion)	c.7	c. 12	285	16	..	..	..
32	F	Lower-nephron nephrosis (mismatched blood-transfusion)	14	..	392	15	60	25	18
36	F	Toxic nephrosis (mercury poisoning)	11	12	325	9	55	26	..
21	F	Toxic nephrosis (mercury poisoning)	11	13	380	16	42	16	..
24	F	Lower-nephron nephrosis (post-abortion) ..	13	18	482	18	57	22	..
47	M	Toxic nephrosis (? cause)	9	..	528	9	59	..	15
39	F	Lower-nephron nephrosis following prolonged shock	10	12	374	12	40	14	..
20	F	Lower-nephron nephrosis (post-abortion) ..	10	..	520	10	50	..	10
25	M	Lower-nephron nephrosis (mismatched blood-transfusion)	8	..	340	8	40	..	8
27	F	Lower-nephron nephrosis (post-abortion) ..	20	24	508	22	35	8·5	..
16	F	Lower-nephron nephrosis (post-abortion) ..	13	15	364	14	35	12	..

erage daily rise of blood-urea level to be about . per 100 ml.

ic Renal Disease

example is shown in fig. 2. It will be seen that, n the presence of very severe renal damage, some ion in blood-urea can be achieved. The patient data are presented in fig. 2 had malignant hyper-n and such reduction of renal function that he d an increasing azotæmia on a diet containing 0 g. of protein a day (see day 15 onwards in the). He died about a month after the end of the charted, with a blood-urea level of over 400 mg. 0 ml., and at necropsy the diagnosis of malignant tension with gross renal damage was confirmed.

ic Uræmia

ring the six-month period ending ecember, 1948, we treated 11 its with extreme oliguria or a lasting 7–21 days. Data on patients are presented in the mpanying table.

the 11 patients 4 died. Of these, 8 and 9 were admitted comatose, t ventricular failure with gross na, and died within twenty-four of admission without regaining iousness. Case 6 was admitted on ighth day of anuria, having had arotomy and splanchnic block previous day. On the day r admission he developed eral basal pneumonia and burst abdominal wound, and he tually died of these compli-ns on the fourteenth day after nset of anuria, when his renal ion was improving. Case 2 arly died after the start of sis. The cause of death was ably a cerebral abscess.

e other 7 patients survived left hospital symptom-free and adequate renal function. In no did extreme oliguria or anuria for less than seven days, and it remarkable that case 10 did not ve an effective urinary output the twenty-fourth day. By tive urinary output we mean re of urine a day, because the at this stage is of practically same composition as plasma filtrate, and at a high level of blood-urea 1 litre is needed on an average to rid the body of a single day's breakdown products of endogenous protein. This is further borne out by the fact that the start of the fall of the blood-urea level almost always coincided with the day on which the diuresis reached 1 litre. The severity of the cases may further be judged by the fact that 3 out of the 7 surviving patients were referred to us by physicians who regarded the prognosis as hopeless.

The effectiveness of the diet as regards its nitrogen-sparing effect is evident from the data presented. In every case there was a considerable slowing of the rate of rise of the blood-urea level after the régime had been instituted. After the same duration of anuria, or at

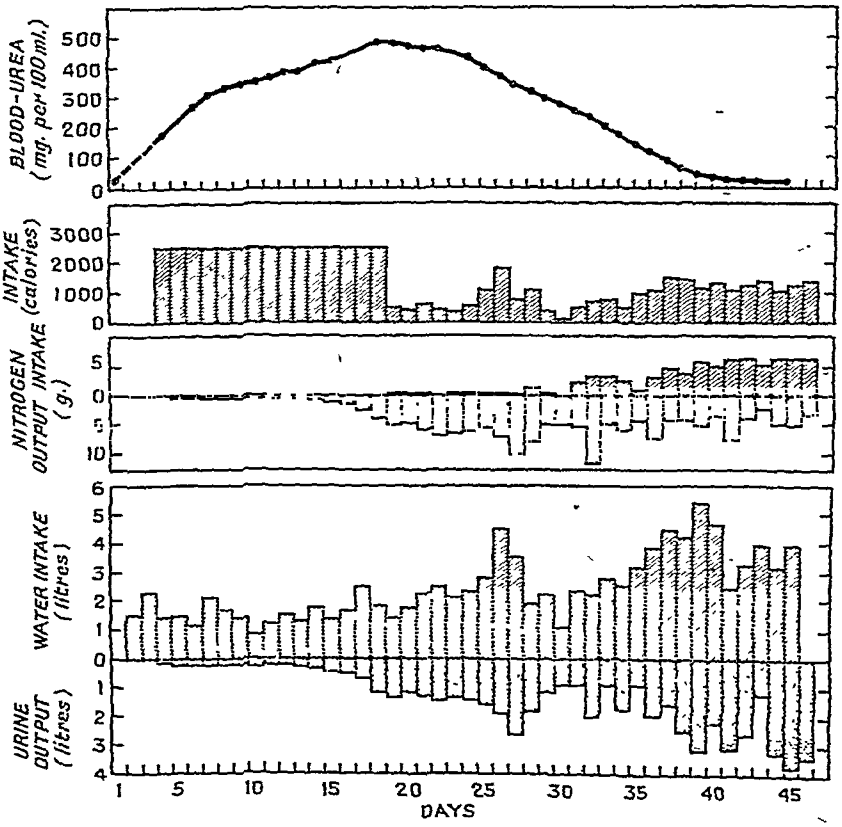


Fig. 3—Nitrogen metabolism in lower-nephron nephrosis (case 5): note excessive fluid intake on day 26 (this was immediately followed by coma, and the resulting disturbance of water and electrolyte balance only passed off on the 32nd day).

the same level of blood-urea, these patients were in very much better general condition than that we had been accustomed to see in patients not on the régime. Often they were sufficiently alert to take an interest in reading or sewing, despite long periods of anuria. This improvement we attribute to effects of the régime other than those on the nitrogen metabolism.

It is of interest that, when feeding by mouth was started again, it was impossible to maintain a high calorie intake, and in some cases it was difficult to maintain a sufficiently high fluid intake as well. This happened despite the fact that the diet contained protein and was not unpalatable, and it emphasises the superiority of tube feeding over feeding by mouth in these cases.

ILLUSTRATIVE CASE-RECORDS

Case 2.—A woman, aged 32, had had a severe hæmorrhage from a septic incomplete abortion on July 9, 1948, and been transfused with 1 pint of incompatible blood. Anuria and jaundice had come on within a few hours. The patient was transferred to Hammersmith Hospital on the fourth day of anuria.

On admission she was anæmic and slightly jaundiced. There was no evidence of water imbalance, but there were signs of a septic incomplete abortion. Her temperature was 99°F.

Course.—The régime was started immediately. The patient's temperature remained slightly raised. On the seventh day she was treated with the artificial kidney. On the eighth day a blood-culture grew *Staph. aureus,* and her temperature had risen. By the tenth day her temperature had risen still further and was swinging in type. She became severely ill, and on the twelfth day she began to have fits. At this stage her temperature started to respond to penicillin and streptomycin, which had been given throughout. The volume of urine began to increase on the fifteenth day, but the patient continued to have fits with increasing frequency and died on the eighteenth day.

Blood-urea Levels.—The mean rise before the régime was instituted was 60 mg. per 100 ml. a day; on the régime before dialysis 25 mg. per 100 ml. a day; and after dialysis but with fever 31 mg. per 100 ml. a day.

Necropsy Findings.—Pigment nephrosis. The uterus showed signs of recent abortion. There was a cerebral abscess due to a penicillin-resistant staphylococcus.

Case 5.—A woman, aged 24, had given herself on Aug. 28, 1948, when about three months pregnant, an intra-uterine douche of soapy water. Shock had developed rapidly, and she had been admitted to hospital. She had remained shocked for about six hours. About eight hours after the douche she had passed a fourteen-week fœtus. Anuria had been noted from the outset, and jaundice from the next day. She was transferred to Hammersmith Hospital on the fourth day of anuria.

On admission there was no clinical evidence of water imbalance and no jaundice. The patient was tender in the iliac fossæ, and her uterus was enlarged to two finger breadths below the umbilicus.

Course.—The régime was started immediately. Diuresis began on the fourteenth day, slowly increasing to exceed 1 litre on the eighteenth day. During the week succeeding the onset of the diuretic phase, gross symptoms and signs, including coma, developed which were believed to be due to disturbances of water and electrolyte balance. However, when these difficulties had been overcome, the patient made a good recovery (fig. 3).

Blood-urea Levels.—The mean rise before the régime was instituted was 57 mg. per 100 ml. a day; during the first week on the régime 26 mg. per 100 ml. a day; and during the week on the régime 16 mg. per 100 ml. a day.

Diagnosis.—Lower-nephron nephrosis due to intra hæmolysis caused by soap.

Case 6.—A man, aged 47, with a doubtful previous mental abnormality, had developed ab colic, vomiting, and severe diarrhœa on Sept. 30, It was not known for certain whether he had been from the outset, but two days later, on his a hospital, this had been definite. Fluids had been a tered in large quantities, and on Oct. 8 a laparotom splanchnic block had been done. The patient was to Hammersmith Hospital on Oct. 9.

On admission he was grossly overhydrated, as sh œdema. His blood-pressure was 230/118 mm. Hg.

Course.—The régime was started immediately. C dation was noted at both lung bases on Oct. 10, temperature rose. Penicillin was given. On Oct. 12, coughing, the patient ruptured his abdominal wound. D began on Oct. 11, but he died on Oct. 15, which was pr the thirteenth day of his illness.

Necropsy Findings.—Bilateral lower-lobe laparotomy wound; and lower-nephron nephrosis of un cause.

Case 8.—A female, aged 20, had had an abortion on or about Oct. 18, 1948. On Oct. 20 she had been to a fever hospital with signs of incomplete generalised peritonitis, and sepsis of the genital tract *welchii* had been grown from the uterus, and large do penicillin and sulphonamides had been given. Severe o and uræmia had been noted within two days of her to hospital. She had developed paralytic ileus, coma, purpura, and been transferred to Hammersmith H on Oct. 29.

On admission she was comatose, febrile, and very tous, and her skin had numerous purpuric spots and moses. Her blood-urea was 520 mg. per 100 ml. She four hours after admission.

Necropsy Findings.—Pigment nephrosis and lo pelvic peritonitis.

Case 9.—A man, aged 25, had had an attack of of unknown cause in November, 1944. From December,

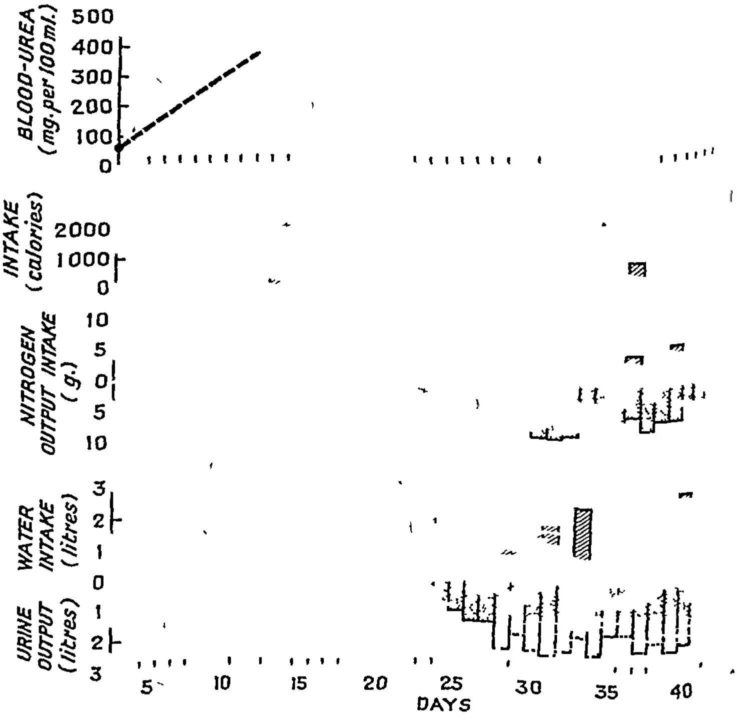
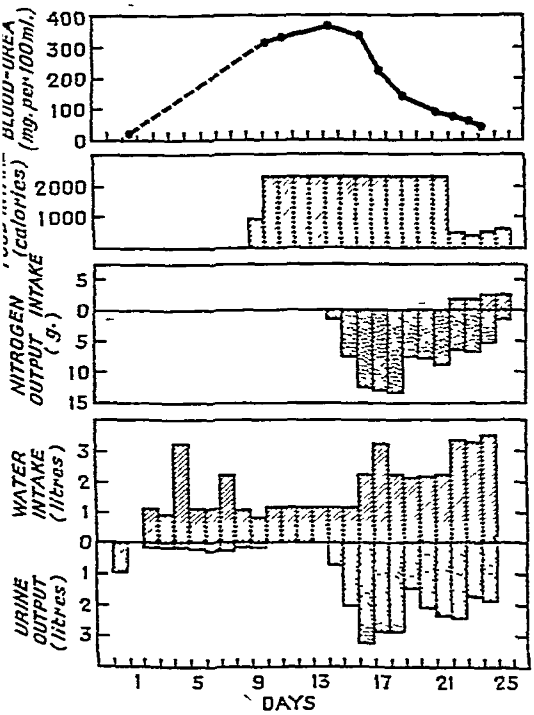


Fig. 4—Nitrogen metabolism in lower-nephron nephrosis (case 10): note long period of oliguria; urine output of 1 litre was only reached on 25th day



5—Nitrogen metabolism in lower-nephron nephrosis (case 11): te unusually rapid fall in blood-urea level after start of uresis.

ιad had frequent hæmatemeses requiring blood-transfu-s. In November, 1948, he had been admitted to hospital ı the clinical picture of Banti's syndrome, and on Nov. 8 ortacaval anastomosis had been made. The operation lasted six hours, and during its course 2 pints of incompatible blood had been transfused. The patient been treated with large quantities of intravenous fluids, peritoneal dialysis had been done from the third day ards. On the fifth day he had become comatose, and the eighth day he was transferred to Hammersmith spital.

n admission he was comatose, pale, grossly œdematous. jaundiced, and had a venous pressure 4 cm. above the nal angle. His blood-pressure was 150/60 mm. Hg.

ourse.—On the evening of the eighth day the patient treated on the artificial kidney, but after ten hours ing which time 26 litres of blood had been dialysed, he eloped a gastro-intestinal hæmorrhage and died without aining consciousness. It was of interest that the gross ema was removed by the dialysis.

ecropsy Findings.—Old and almost complete obliteration the portal vein near the liver hilum; extensive collateral ulation; recent portacaval anastomosis: and pigment hrosis.

ase 10.—A woman, aged 27, had given herself on Nov. 23, 8, when she was about two months pregnant, an intra-ine douche of 'Dettol' and soap, and had aborted next ning. Severe oliguria had probably started immediately, this is not certain from the history. On the eighth day patient had been admitted to another hospital, and on eleventh day she was transferred to Hammersmith spital.

n examination she was somewhat drowsy, but there e no other signs or symptoms of uræmia. There was evidence of water imbalance.

ourse (fig. 4).—Diuresis was considerably delayed, starting the twenty-first day and only exceeding 1 litre on the nty-fifth day. However, her general condition did not eriorate until the twenty-seventh day, during the diuretic se, when she had an epileptic fit. Otherwise her progress smooth.

lood-urea Levels.—The rise before the régime was instituted 35·3 mg. per 100 ml. a day, and on the régime 8·5 mg. 100 ml. a day.

Diagnosis.—Severe lower-nephron nephrosis following abortion.

Case 11.—A girl, aged 16, had attempted to procure abortion by syringing on Nov. 30, 1948. Some hæmorrhage had followed, and she had been shocked for about twenty-four hours. The fœtus had been passed a few hours after the syringing. There had been severe oliguria from the outset. Despite penicillin given from the first day, the patient had developed uterine sepsis, and the uterus had been evacuated on the third day. The patient had become drowsy and œdematous, with profuse diarrhœa and vomiting, and had been extremely ill. The penicillin dosage had been increased on the seventh day, and the patient was transferred to Hammersmith Hospital on the ninth day, by which time her temperature was settling.

On admission the patient was œdematous, drowsy, and pale (Hb 44%). Her peripheries were warm, with a bounding pulse, and capillary pulsations in the fingers. Her plantar reflexes were extensor. Her uterus was palpable and tender, and there was tenderness in the iliac fossæ.

Course (fig. 5).—The régime was started immediately. The temperature settled rapidly and within two days was normal. After a profuse epistaxis on the thirteenth day the patient was transfused with 2 pints of blood. Diuresis started on the fourteenth day, and the further course was uneventful except for unexplained pyrexia in the fourth and fifth weeks. Improvement was unusually rapid.

Blood-urea Levels.—The rise before the régime was instituted was 35 mg. per 100 ml. a day, and on the régime 12 mg. per 100 ml. a day.

Diagnosis.—Lower-nephron nephrosis following abortion.

DISCUSSION

From a study of published reports it is impossible to gain an accurate figure for the mortality in lower-nephron nephrosis, but we cite the following estimates as an indication: Lucke (1946) estimated the mortality to be 90%; and Kilduffe and DeBakey (1942) found the mortality of all hæmolytic reactions regardless of severity, occurring in a series of 43,284 blood-transfusions to be 57·7%. Both Lucke's and Kilduffe and DeBakey's mortality figures are an over-all survey, whereas we have only included patients whose anuria had lasted for more than a week. In such a series an even higher mortality might be expected. We believe that, with the régime outlined, the mortality should be negligible.

We have evidence that the high carbohydrate content of this diet is important not only in reducing the breakdown of endogenous protein but also in reducing the concentration of potassium in the extracellular fluids. We wish to emphasise again that the effectiveness of the régime is not entirely due to its nitrogen-sparing effect, but that collateral effects on mineral balance are of equal or greater importance.

Dialysis methods have their dangers and difficulties, and we believe that, where this régime is started early, dialysis should not be undertaken. However, dialysis probably has a place in the treatment of the patient who is already in gross water, mineral, and nitrogen imbalance. Other methods of therapy, such as splanchnic block, spinal anæsthesia, and decapsulation of the kidney, are of doubtful value, and their use must be assessed against conservative management.

SUMMARY

A régime for the treatment of anuric uræmia is described which is based on accurate control of water, mineral, and nitrogen balance.

During the anuric phase the fluid intake balances the insensible water loss. The diet is completely nitrogen-free and mineral-free and high in calories to depress endogenous nitrogen metabolism. To ensure an adequate and accurate intake of water and calories, a mixture of fat and glucose in water is given by intragastric drip.

During the phase of "recovery-diuresis" the management is modified to replace the urinary loss of water and minerals.

If the conservative management is instituted sufficiently early without previous overhydration, diuresis can be confidently anticipated in anuria due to any recoverable renal lesion. The recovery may be considerably delayed, and in one of our patients it took place after more than three weeks' extreme oliguria.

We wish to thank the sisters and staff of wards B 1, 2, 3, and 4, and Miss Simmonds and her staff in the dietetic department, for their patience and willing cooperation; Miss Patricia Burrows for assistance with the diagrams; the staff of the biochemical department for certain analyses; and Professor McMichael for his help throughout.

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REMOVAL OF SIMPLE UNIVESICULAR PULMONARY HYDATID CYST

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MY experience of pulmonary hydatid disease (now comprising nearly 50 cases) has led me to express some opinions on the pathology, diagnosis, and treatment of this condition.[1] As the cases have accumulated ideas have matured; and a technique for removing the parasite from the lung has been gradually evolved. The object of this communication is to report the details of this part of the operation.

In the treatment of a hydatid cyst in the lung three things must be achieved: to remove the parasite, to avoid contaminating the pleural cavity or the wound with hydatid fluid, and to deal with the "empty sac" in the lung. The most difficult of these is to get the cyst out of the body without spilling a drop of hydatid fluid, and the only way of achieving this is to remove it intact without tearing, puncturing, or rupturing the laminated membrane.

Circumstances are more favourable to the surgeon in the case of lung cysts than when the parasite is lodged in other organs. The reason is as follows. In the ordinary course of events if a hydatid in the lung is treated expectantly it grows until some complication occurs or the host dies. As the cyst wall approaches the surface of the lobe which contains it, the adventitia thins out, in the area where the laminated membrane abuts on the visceral pleura, until finally it cracks and the parasite is extruded spontaneously from the lung into the pleura. In this process the hydatid sometimes ruptures, but it often remains intact and falls to the bottom of the pleural cavity, where it gains a new attachment to the host and continues to grow. tendency to herniate out of the lung naturally is imita in the operation to be described. The laminated m brane is strong so long as it is intact, but a ne however fine, introduced into the cyst for aspiratin dry at operation, practically always starts a tear w results in rupture of the cyst before the parasite can got out of the body. If the cyst leaks or ruptures i difficult to pack it off so as to prevent contaminatio the tissues with scolices or brood capsules.

TECHNIQUE

A technique which offers good hope of success in case of univesicular simple hydatid cyst is as follows

The patient is given a general anæsthetic, and this is ma tained after a cuff tube has been introduced into the trac to make an airtight circuit. The head of the table is lo so that if the cyst ruptures into the bronchus the h drains from the lungs by gravity. The appropriate he thorax is opened, either by rib-resection or an interco incision placed at about the level of the middle of the c and the pleural cavity is opened *widely* with rib spreaders. pleural adhesions are present they are divided so that lobe which contains the cyst is free. The affected lobe, where a giant cyst is present, the cyst, is then enclosed i bag of thin mackintosh, made like a sponge bag, with stri at the top for gathering up the inlet, but the bottom open. The bag is placed round the lobe containing cyst with the strings at the hilum, and these are dr up moderately tightly to encircle the neck of the lobe with impeding respiration in the lobe or the blood-supply. bottom of the bag is then opened out, brought through incision and spread out on the surface of the wound so t the affected part is inside a waterproof container. The not only gives some protection against accidental rupt but, later in the operation, is an excellent retractor. exact position of the cyst in the lobe is now ascertai and in most cases the adventitia will be seen on the surf of the lung as a patch of white membrane. If the hyda has not grown up to the surface, the lung is incised over cyst and down to the adventitia. The stage is now set *removing the cyst.*

The adventitia is partially incised by a straight cut wit knife. The length of the incision should be about the sa as the diameter of the cyst measured in the radiographs, a it should be placed towards the bottom of the cyst as t patient lies on the table. The incision must be ma cautiously, because as a rule the adventitia of lung cysts not more than $^{1}/_{8}$ in. thick. The object is to form a cra in the adventitia and not to expose the laminated membra throughout the length of the incision. If the laminated mem brane is exposed it will be obvious because of its colour white faintly tinged with blue. Once the laminated membra has been exposed in one spot the incision in the adventitia can be extended by lifting it off the cyst and cutting wit blunt-pointed scissors for about an inch. No attempt shoul be made to expose the cyst widely.

The surgeon's job is now for the time being over; succe now depends on not touching the parts until the cyst has extruded from the lung. This is achieved by the anæsthet who steadily increases the pressure in the anæsthetic circu so that little by little, over 10–30 minutes, the adventi cracks to the full length of the incision and the hydat gradually falls out of the lung intact and lies in the mackint bag. During this period there must be no attempt to h matters, and if the surgeon cannot be persuaded to lea well alone the safest instrument for him to use is a ster household spoon of appropriate size.

Once the cyst has herniated out of the lung it lies in the by the side of the lobe which originally contained it. operation table should now be tilted towards the surgeon that by tightening the lower margin of the bag the cyst lifted towards the surface and rolls naturally into a porri held to receive it. The moment when a hydatid rolls o of the lung intact is one of the most satisfying in surgery.

When the hydatid has been removed the surgeon m consider the best plan to adopt in relation to the "sac left in the lung. This has been dealt with in the pa already mentioned.

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DIURNAL VARIATION IN THE FAT CONTENT OF BREAST-MILK

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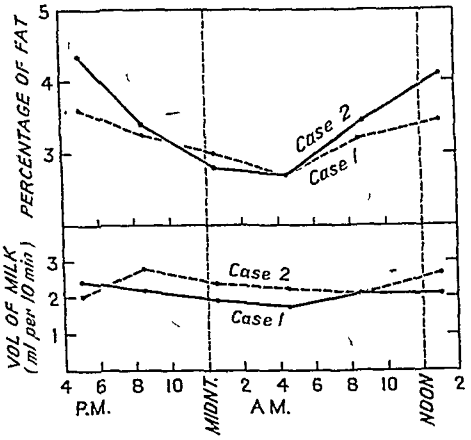
DIURNAL variation in the percentage of fat in cow's has been recognised for more than a century, a similar variation in human milk has also been ribed by Plauchu and Rendu (1911), Denis and ot (1919), Deem (1931), and Nims et al. (1932). e, in milking a mammary gland, the percentage of in the milk expressed rises continuously from first st, the percentage of fat in the whole sample depends part on the extent to which the gland has been ptied. In the ordinary process of milking a cow e total volume obtained is affected by the "letting wn" process, which appears to be a driving forward the alveolar contents brought about by the action posterior pituitary hormone on contractile elements the gland. Variations in the percentage of fat in the hole sample due to less or more hind milk being cluded in it can be greater than the usual range of urnal variation.



1—Percentage of fat and volume of milk obtained 4-hourly roughout 24 hours with injections of pitocin 1 unit (cases 1 and 2).

The secretion of fat in cow's milk has recently been udied by a more exacting technique. An intravenous jection of 'Pitocin' has been given at the end of e ordinary milking and the extra fluid available pressed. By milking in this way at constant intervals roughout the day and night an almost constant rcentage of fat has been obtained in all milkings ter the first (Shaw 1942). The doubt which this ork cast on the reality of diurnal variation in women as increased for two other reasons: (1) in all the reports variation in the percentage of fat in human milk e investigators had allowed a long night interval, hich in itself might have caused the percentage of t to vary; and (2) where the observations were rried on for three days the variation had almost isappeared by the third day (Nims et al. 1932).

The present investigation was made to determine hether the percentage of fat in human milk showed a iurnal variation despite complete and regular emptying the breast—i.e., whether the variation depended on hanges in the formation of the milk—and whether if ere was such a variation, the percentage of fat could be made more constant by feeding the mother by night as well as by day.

DIURNAL VARIATION IN WOMEN RECEIVING NO FOOD SUPPLEMENTS

The variation in percentage of fat during 24 hours was studied with the aid of pitocin injections in two women (cases 1 and 2) on the tenth and eleventh days after delivery. The milk samples were always withdrawn from the same breast at intervals of 4 hours by day and night by the same investigators. The baby took the other breast 4-hourly, five times during the 24 hours, immediately after the emptying of the breast used for sampling. The babies were not fed at midnight. The same technique was used at each milking-time: after the breast had been milked as dry as possible by manual expression, one unit of pitocin was injected intravenously and the breast was milked again by further manual expression. In these two women the dose of pitocin caused a few drops of milk to run from both breasts each time, and a considerable volume of milk, as much as a quarter of that already milked out, was obtained.

The percentage of fat in the entire milk sample was estimated in duplicate by the Gerber method.

Fig. 1 shows the percentages of fat and volumes of milk obtained from the two women. Despite the almost constant degree of emptying, as shown by the approximately level line for volume, there was a definite and regular variation in the percentage of fat in the milk.

DIURNAL VARIATION IN RELATION TO FOOD INTAKE

The influence of food on these diurnal variations was studied in six women (cases 3–8) by sampling the milk 4-hourly for 52 hours and by giving the women, during one of the two nights, food of sufficient calorie value to make the intake about the same throughout the 24 hours. Three women received the supplementary food during the first night of the experiment and three during the second. The supplements consisted of sugar and milk in coffee, and cakes made of flour, sugar, and margarine. All the women were primiparæ except one who had borne two children. The investigation was begun between the eighth and the eleventh day after delivery.

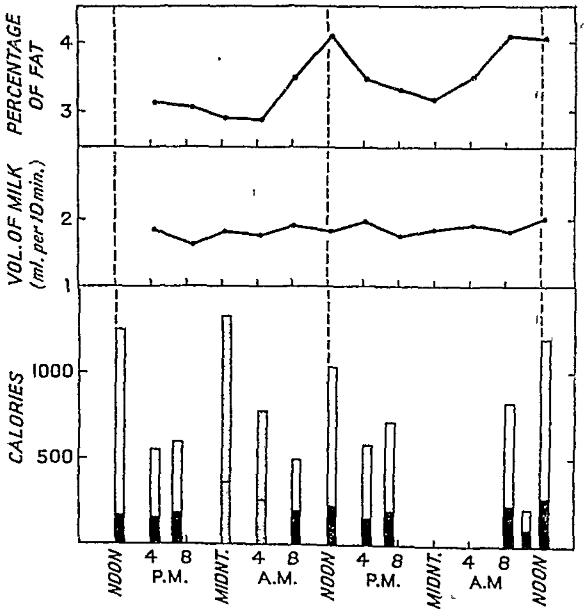


Fig. 2—Percentage of fat and volume of milk in case 3 given pitocin 2 units 4-hourly. Columns represent calories in meals, the darker bases showing the amount taken as fat; stippled columns represent additional food taken at night.

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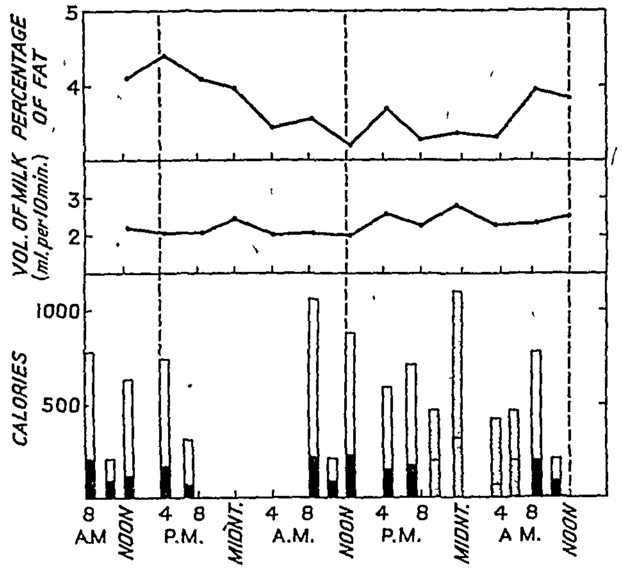

Fig. 3—Percentage of fat and volume of milk in case 4 given pitocin at initial emptying and at taking of first five samples only.

The technique of emptying described above but with doses of two units of pitocin 4-hourly was used throughout the investigation on case 3 (fig. 2). In cases 5–8 (figs. 4–7) the 4-hourly emptying was made without pitocin. In case 5 (fig. 4) pitocin injection was tried repeatedly at the outset; but, though it caused a few drops of milk to exude from the nipple, no extra milk could be expressed. Case 4 (fig. 3) received pitocin at the initial emptying and during the taking of the first five samples; but, since she felt faint after the injection at 4 A.M., the pitocin was discontinued.

Figs. 2–7 show the variation in the percentage of fat in the milk withdrawn 4-hourly from these women during the two days. Since the time taken to withdraw a sample was an appreciable part of the 4 hours of an interval, the recorded moment of sampling was the time when the withdrawal was completed. In some instances this moment was as much as 10 minutes before or after the intended one. To take into account this small variation the volume of milk obtained has been divided by the length of the interval. In figs. 1–7 the volume is given as the number of ml. of milk obtained per 10 minutes. The columns in figs. 2–7 indicate by their height the total calories taken, the darker portion at the base of each representing the calories taken fat. The stippled columns represent supplemen food. In cases 3 and 5 it can be seen that, in spit the constant volumes obtained at each milking, t was a pronounced diurnal variation. Only case 4 s no clear variation, and this may have been due omission of the pitocin injections after the fifth sa

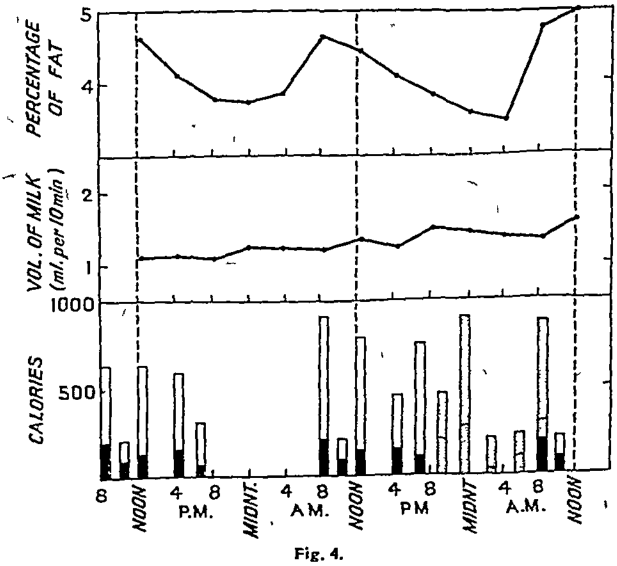

Fig. 4.

The six cases together demonstrate clearly that rise and fall in the percentage of fat in the milk did depend on the time of intake of food or on the am of fat it contained. There was a conspicuous rise in percentage of fat in the milk secreted between 4 and 8 A.M. even when the mother had taken no for 12 hours, except for breakfast eaten immedi before the 8 A.M. sample was withdrawn. Conve the percentage of fat fell during the day, when f was being taken. No evidence was obtained that f might have a delayed effect, for the changes were same whether the mother was given some or no f during the previous night. Activity on the part of mothers also seemed to have no effect; for, though 4–8 A.M. rise in the percentage of fat followed the

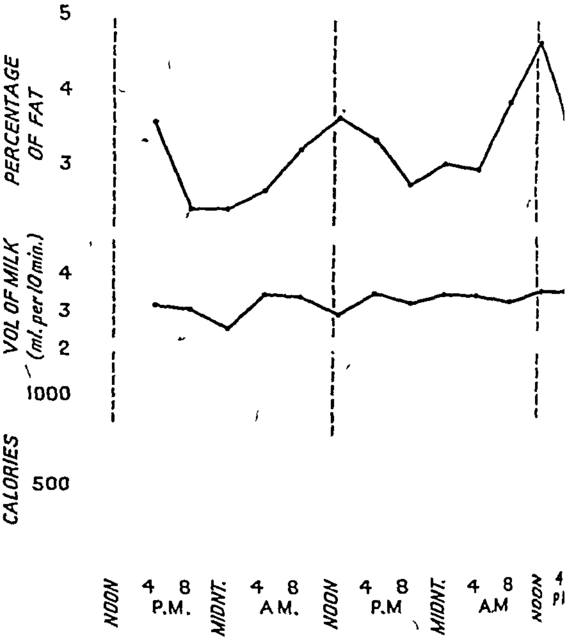

Fig. 5.

morning duties, the mothers merely fed their babies that time, washed themselves, and returned to be They were most active in the late afternoon, 12 ho later, and then the percentage of fat was falling.

DISCUSSION

The diurnal variation in the percentage of fat in milk from women who received pitocin is essenti similar to that reported by Deem (1931) and Nims et (1932) and resembles that of the women who, in present investigation, received no injections. The de of the variation was very little, if any, smaller w the removal of milk was aided by pitocin than whe was not. In the present investigation the richest was secreted in the morning, as it was in those of D and of Nims et al. The nadir seems to vary betw 8 P.M., midnight, and 4 A.M.

In Ružičić's (1936) 10-day study of five wom the percentage of fat in the milk varied according the diet. When the mothers lived on bread alone 3 days the variation in the percentage of fat was v small; when the mothers received a mixed diet percentage of fat was highest in the morning witl

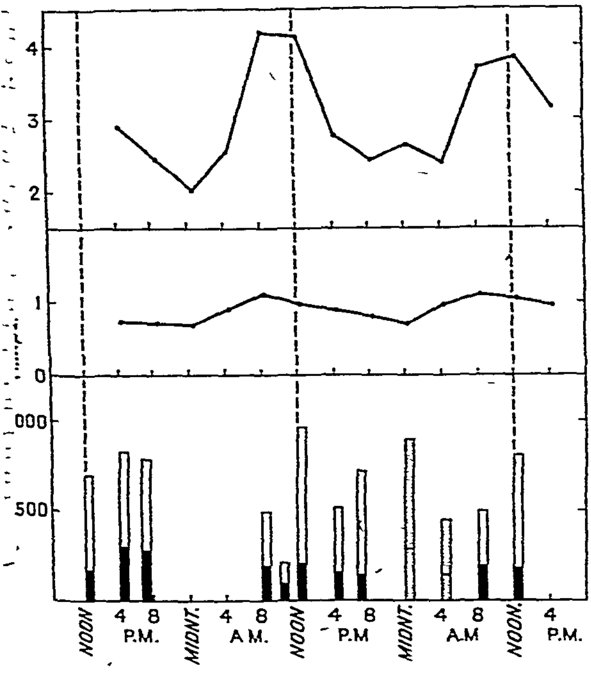

Fig. 6.

ond peak in the evening ; and, when for 3 days the thers ate only bread except for a daily dose of butter 9 g. (about $^1/_2$ lb.) taken all at one time, the richest lk was obtained about 12 hours after the ingestion of fat. Ružičić concluded that the time of day per se not affect the percentage of fat, but that the varians depended on the diet. Our findings do not agree h those of Ružičić.

The mechanism underlying the diurnal variation nains a subject of conjecture and is being further estigated.

If the variation is of benefit to the baby, the reason not immediately apparent. Possibly the poorer milk the early morning enables the baby to take more id and so to replace the night's loss of water. Curiously ough, the customary routine of breast-feeding is likely to add to the disparity in the percentage of fat due to diurnal variation. The long night interval and the 3-hourly or 4-hourly feeding during the day probably provide the baby with milk with a lower percentage of fat on waking, since the breasts are seldom emptied then, and even richer milk at midday by inclusion of the rich residual hind milk from the early morning. The small volume of milk often taken at 2 P.M. is perhaps a physiological response on the baby's part to the richness of the milk at that time.

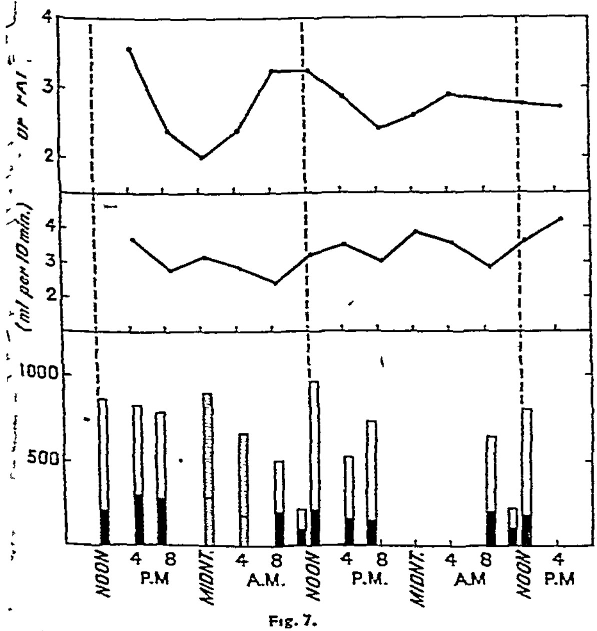

Fig. 7.

gs. 4-7.—Percentage of fat and volume of milk in cases 5-8, not given pitocin.

SUMMARY AND CONCLUSIONS

An investigation was made to discover whether the diurnal variation in the percentage of fat in breast-milk, reported by previous workers, was caused by changes in the secretion of milk within the breast or by varying proportions of hind milk being included in the samples.

A diurnal variation was found even though the breast was emptied at constant intervals and the emptying completed with the aid of intravenous injection of pitocin. This variation is therefore attributed to variations in the composition of the milk being secreted. It was not related to meal-times, and was unaffected by the administration of food during the night.

This investigation forms part of a study of the relation of diet to the composition of breast-milk which has been carried out in the Landesfrauenklinik at Wuppertal. Grateful acknowledgment is made to Prof. K. J. Anselmino, director of the clinic, for hospitality, and to Dr. A. von Finck for assistance. Our warm thanks also go to Prof. R. A. McCance and Dr. E. Widdowson for much help and encouragement.

Both investigators were in receipt of grants from the Medical Research Council.

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SLOUGHS OF THE TRACHEAL MUCOSA

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MUCH has been written about the need for a gas-tight system when a closed-circuit method of anæsthesia is used. Very little has been mentioned about the dangers which may follow the use of the cuffed type of endotracheal tube. This type of tube is often advised to ensure that the circuit is leak-proof, and the cases described below give adequate warning of the dangers inherent in this technique.

Hewer (1946) has drawn attention to tracheitis as a complication of endotracheal anæsthesia, especially in operations on the thyroid gland: and it has been shown that the use of biniodide of mercury for the sterilisation of tracheal tubes has caused the tracheal mucosa to slough (Ransome 1947). Lundy (1944) believes that there are patients whose mucosæ cannot tolerate any trauma: but such patients must be rare.

Hewer (1946) has also indicated a reliable method for ensuring the proper inflation of these cuffs, and this was adopted in cases 1 and 2 described below.

Case 1.—A woman, aged 25, underwent a left lower lobectomy, with removal of the lingular process, for bronchiectasis on May 17, 1948. After operation her condition and progress were satisfactory, but she had a peculiar high-pitched wheezy cough, which seemed to be associated with a moderate degree of obstruction to the expulsive effort, as though the glottis were partially occluded. A slough was removed from the trachea by bronchoscopy on May 19. This gave complete relief from wheezing and obstruction, and the patient made an excellent recovery.

It was thought in this case that the slough might be a bronchial cast, but it was difficult to see how it had escaped removal at the bronchoscopy which was done at the end of the operation.

Case 2.—A woman, aged 27, underwent pneumonectomy *on June 10, 1948,* for total bronchiectasis of the left lung. Her postoperative course was satisfactory, except that she had the high-pitched wheezing type of cough, associated with partial expiratory obstruction, which had been noted in case 1. This cough made us suspect that a slough might be present in the trachea, and on June 13 a slough was seen and partially removed by bronchoscopy. Complete removal was impossible, because a small portion remained adherent to the tracheal mucosa about 1 in. proximal to the carina. There was considerable improvement in the patient's symptoms after this partial removal, but there remained some wheezing, and her coughing was not entirely free from embarrassment. At a second bronchoscopy, on June 17, the remaining portion of the slough was removed. At this time a roughened area of mucosa was seen on the whole circumference of the trachea, extending in a proximal direction for about 1 in. from the place at which the slough had been adherent at the previous bronchoscopy.

This evidence was taken as sufficient to dispel any idea of bronchial casts, and attention was directed to the anæsthetic technique.

In these two cases the endotracheal tubes were no. 9 'Portex' Magill tubes, and a rubber cuff had been slipped on to each one. Inflation was by the method recommended by Hewer. There is no evidence that the plastic tubes were in any way responsible for the damage, and at no time was biniodide of mercury used in the sterilisation of the tubes or cuffs.

The same technique had been used in a large series of thoracic cases, and we had not noted any such catastrophes up to the time of the first case here recorded. There can be no doubt that the sloughs were caused by pressure; in short, the cuffs were too tightly inflated.

There are certain differences in case 3 which make it important to review the technique used.

Case 3.—A boy, aged 11 years, had his left lower lobe removed for bronchiectasis on July 20, 1948. He was uncooperative and had to be urged to cough. On July 23 he had developed the characteristic cough, and bronchoscopy was done at once. A slough was found adherent to the vocal cords, and bits of this were removed. Again on July 24 pieces of the slough were removed, but a portion still adhered to the cords. His progress was satisfactory, apart from the intense trouble we had in making him cough. During the night of July 27 he suddenly became cyanosed and collapsed, and by the time assistance arrived his state was such that bronchoscopy was easily done without an analgesic. A fairly large piece of slough had become wedged between the cords, and its removal immediately relieved the cyanosis. His further convalescence was uneventful, and his final recovery complete.

A no. 6 rubber Magill cuffed tube was used on this child at operation; the cuff was not inflated. The position which we adopt for lobectomy is a slight modification of that described by Brown (1948), and the child's head was sharply turned to the right during the operation. There can be no doubt that the angle at which his head was turned forced the tube hard against the vocal cords and probably the larynx and perhaps the upper centimetre or so of the trachea, with the unfortunate results described.

An adult will probably cough up such a slough without much trouble when it becomes free to move in the trachea; if this were not so, we should probably have heard more of these sloughs since cuffed tubes must often be used in patients undergoing upper abdominal section. In children, however, the glottis is too small to allow the expulsion of a slough such as we have described, and the congestion rapidly produced by anoxia only makes matters worse, while anoxia will of itself abolish the efforts to cough and expel the foreign body.

It is doubtful if these sloughs would have bee had the patients not been treated in a thoracic for the adults would probably have expelled their sl and the child would almost certainly have died a bronchoscope could have been brought. N would have revealed the true state of affairs, bu unlikely that the cause would have been realised isolated case.

I wish to thank Mr. B. Winter, assistant surgeon Leicester Thoracic Unit, for his helpful criticism and timely interventions with the bronchoscope.

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MEGALOBLASTIC ANÆMIA IN CŒLI DISEASE TREATED WITH FOLIC A

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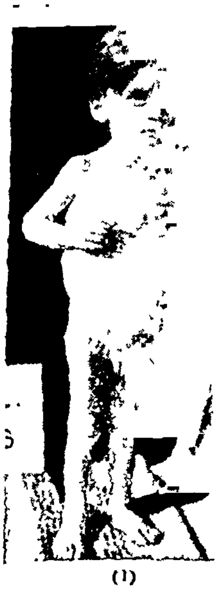
In 1946 we published a brief note on two ca megaloblastic anæmia in cœliac disease (Dalton 1946). These have now been fully investigated as re analysis of fat in the fæces, glucose-tolerance blood-counts, marrow biopsies, radiography of gastro-intestinal tract, Mantoux tests, examinati duodenal juice for trypsin and lipase, and exami of fæces to exclude parasites, &c.

Case 1.—A boy, aged 2 years 2 months, was admi hospital on April 23, 1946, with a history of losing and passing frequent pale bulky offensive stools. At th of 1 year he had had diarrhœa and vomiting. His abd had then been unduly large and his motions offensiv bulky, containing mucus but no blood. He had been t in another hospital for some months.

On admission he was a miserable wasted child with a distended abdomen (fig. 1). No other specific signs found.



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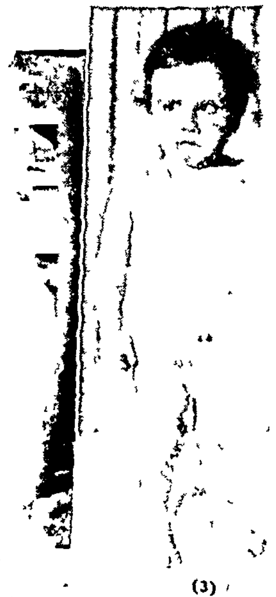

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Fig. 1.—Case 1 on admission.

Fig. 3.—Case 1 after three months' treatment with folic acid.

stigations.—The fæcal fat was estimated on five occa- n eight months. An excess of fat averaging 49·10% d fæces (maximum 56·14%, minimum 35·50%) was ; on the three occasions when the patient was on y diet. The excess of fat was in the free fatty acids occasion and in the combined fatty acids on another. the patient was on a high-protein low-fat diet, the at averaged 18·9% of dried fæces (maximum 20·37%. um 17·46%). Oral glucose-tolerance tests (Hagedorn nsen 1923) done on six occasions in eighteen months onsistently flat curves, the greatest rise in blood-sugar 29 mg. per 100 ml. Duodenal juice contained a normal ty of trypsin (Andersen and Early 1942). No parasites ound in the fæces. Radiography of the gastro-intestinal fter a barium meal showed clumping of the barium in um. A Mantoux test was negative. His red-cell count t. 9, 1946. was 4.500,000 per c.mm., Hb 79%. The lls varied in size and somewhat in shape, and stained . The mean cell diameter was about 8·0 µ (halometer d). Many macrocytes were present (10–12 µ by eye- nicrometer). Sternal marrow (Sept. 26. 1946) showed nucleated cells per c.mm.:

Cells	*Percentage*
Promyelocytes	10·0
Myelocytes	4·0
Metamyelocytes	5·5
Staff cells	7·5
Polymorphs	5·0
Eosinophils	0·5
Basophils	0·5
Lymphocytes	17·0
Normoblasts	34·5
Megaloblasts	11·0
Unclassified cells	0·5
Mitotic cells	0·5
Giant staff cells	0·5
Monocytes	3·0

atment and Progress.—Folic acid 5 mg. daily was begun t. 3, 1946, together with iron and ammonium citrate t.d.s. and ins A, D, C. Con- t clinical ovement ed (fig. 2). ct. 3, the weighed lb. He till miser- and silent, could be aded to only with difficulty. ongue was dsmooth, kin loose abby, and abdomen ded. On 21st he d stand pported talk, and as much cheerful. On the 28th he would call out and play in bed, and he now seemed happy. From Dec. 5 acid 5 mg. was given twice weekly instead of daily. an. 18, 1947, the child weighed 28 lb., was happy, ble to run about the ward. Apart from improved nutrition itality, the steatorrhœa, abdominal distension, and radio- l appearances remained materially unchanged, and the se-tolerance curve remained flat. On Dec. 9 the child very fit, but his abdomen was still distended (fig. 3), æces contained 35·5% of fat, and the oral glucose- nce curve was still flat. The patient was discharged n. 6, 1948, and in September, 1948, his mother wrote his condition was satisfactory.

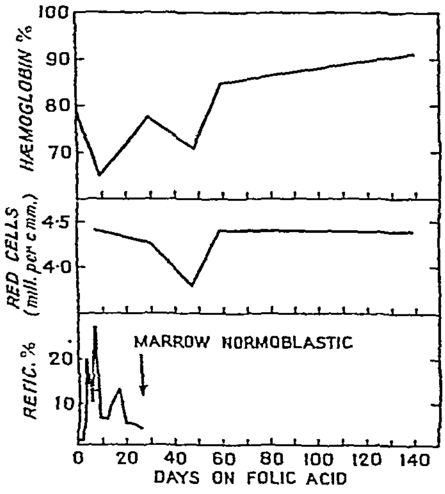

Fig. 2.—Blood response to folic acid (case 1).

se 2.—A boy, aged 1 year 6 months, was admitted to tal on June 25, 1946. He had been well until the age of onths, when he had had diarrhœa and vomiting for three hs. After this he had improved, but the diarrhœa had recurred. His stools had contained mucus but no blood, and his abdomen had enlarged.

On admission he was a miserable wasted child, with a distended abdomen and visible intestinal movements. The stools were yellow, loose, and offensive, but not bulky.

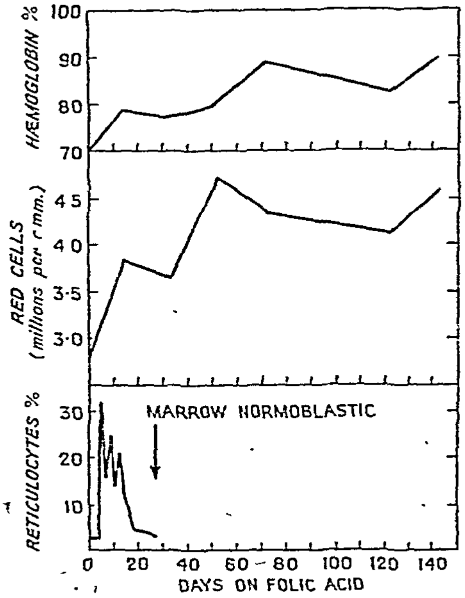

Fig. 4.—Blood response to folic acid (case 2).

Investigations.—The fæcal fat was estimated on five occasions in nine months. Each time an excess in total fat was present, averaging 41·95% of dried fæces (maximum 52·30%, minimum 31·59%), and the neutral fat was normal. The excess of fat was in the combined fatty acids on two occasions, and in the free fatty acids on three. Oral glucose-tolerance tests done on four occasions in five months gave consistently flat curves. Duodenal juice showed a normal quantity of trypsin; lipase was present. No parasites were found in the fæces. Radiography of the gastro-intestinal tract after a barium meal showed clumping of barium in the ileum. A Mantoux test was negative. A fractional test-meal showed complete achlorhydria. The red-cell count on Aug. 9, 1946, was 3,370,000 per c.mm., Hb 83% (Haldane). Anisocytosis was fairly well marked, and a good many macrocytes were present. Most of the cells stained well; a few polychromasic forms were seen. Sternal marrow (Sept. 26, 1946) contained 47,900 nucleated cells per c.mm.:

Cells	*Percentage*
Promyelocytes	2·0
Myelocytes	9·5
Metamyelocytes	13·0
Staff cells	5·5
Polymorphs	4·5
Eosinophils	6·0
Basophils	0·5
Lymphocytes	19·5
Normoblasts	16·0
Megaloblasts	20·0
Unclassified cells	2·5
Mitotic cells	1·0

Treatment and Progress.—Folic acid 5 mg. daily was *given* starting on Oct. 3, 1946, together with iron and ammonium citrate gr. 10 t.d.s. and vitamins A, D, and C. The response is shown in fig. 4. At the start of this treatment he weighed 17 lb. 7 oz., was very miserable, and could not stand without support., His tongue was smooth and red, his gums spongy, and his abdomen not much distended.. There was general wasting, severe pallor and a very poor appetite. On Oct. 25 the child weighed 19 lb. 6 oz. On the 29th he could stand unsupported, but still showed little activity though temperamentally more cheerful. On Nov. 16 he weighed 20 lb. 4 oz. On Nov. 19 there was some deterioration in his general condition but his weight was maintained. On Nov. 22 he developed measles. On Dec. 21 he weighed 21 lb. 3 oz. and was eating well; his general condition had improved. On Jan. 10, 1947, he was discharged from hospital on a maintenance dose of folic acid 5 mg. twice weekly.

On June 22, 1947, the boy was readmitted to hospital. Improvement had been maintained until two weeks before, when he had begun to pass watery stools. He was irritable, unhappy, and moderately dehydrated, with a slightly distended abdomen. He was put on a cœliac diet, vitamins A and D, 'Hepargiandol B' 1 ml. twice weekly, and folic acid 5 mg. weekly. The diarrhœa improved. His red-cell count on July 1 was 4,250,000 per c.mm., Hb 82%. On July 9 fæcal fat was estimated as 39·06% of dried fæces. On July 16 the patient weighed 23 lb. 8 oz., and on Aug. 6 20 lb. 2 oz. On Aug. 9 he was sent home.

On Sept. 12, 1947, the child was again admitted to hospital, having developed generalised œdema two weeks earlier. He was now emaciated, with œdema of the face, limbs, and sacrum, and he weighed 19 lb. 10 oz. His total serum-protein level was 3·30, serum-albumin 1·86, and serum-globulin 1·44 g. per 100 ml.; albumin/globulin ratio 1·29. Blood-urea 45 mg. per 100 ml. The child was given double-strength plasma, followed by 'Casydrol' intravenously and high-protein 'Trufood' by mouth. On Sept. 20 his œdema was less, and on the 23rd the intravenous amino-acids and dextrose were repeated, considerable improvement following the infusion. On Sept. 27 the child developed tetany, which responded to calcium gluconate given intramuscularly. Further treatment with intravenous amino-acids, folic acid, &c., produced no response, and his general condition deteriorated rapidly. The œdema increased and death followed the onset of bilateral otitis media and bronchopneumonia.

Necropsy Findings (Dec. 12, 1947).—Bronchopneumonia, otitis media, and duodenal ulcer were found. The body, examined 10 hours after death, was emaciated, with slight œdema of the ankles, and practically no superficial fat. The middle ears contained thick yellow pus. Gram films showed numerous pus cells and pneumococci; cultures grew moderate numbers of *Staph. pyogenes* and coliform organisms. Both lungs showed œdema and inflammatory consolidation. The right ureter was dilated, but the left healthy. The duodenum had an ulcer measuring 7 x 4 mm. about 1 cm. from the pylorus, its long axis being at right angles to that of the intestine. Many segments of the small intestine were dilated and atonic; these were separated by short more or less normal segments.

Histology.—The lung showed the usual appearances of bronchopneumonia. In the pituitary gland there was a complete absence of acidophil cells. The liver and small intestine appeared to be normal.

COMMENTS

These cases showed the classical signs of cœliac disease. Our hopes that folic acid would prove a cure have not been fulfilled. We cannot say that folic acid achieves any better blood response than might have been obtained with liver.

The incidence of megaloblastic anæmia in cœliac disease is small. We have examined the marrow in 11 cases without finding such another. However, a further case has been reported to us by Dr. M. Egan, and the presence of megaloblastic anæmia was verified by Dr. M. C. G. Israëls. We understand that investigations at the Hospital for Sick Children, Great Ormond Street (I. A. B. Cathie, personal communication), Edinburgh (Innes 1948), Liverpool (Hay 1948), and Sheffield (J. L. Emery, personal communication) have not disclosed any further cases.

SUMMARY

Two cases of megaloblastic anæmia in cœliac disease are described.

After treatment with folic acid both children improved.

In one case the improvement has continued, but in the other it was only temporary and the child subsequently died; the necropsy findings are given.

We are indebted to the late Dr. C. P. Lapage for permission to treat case 2 with folic acid, and to Dr. T. N. Fisher for allowing us to make observations on case 1.

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VOLVULUS OF THE CÆCUM PRESEN AS A STRANGULATED INGUINAL HE

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THE hernial sac is the foremost thought of any s in the examination of the acute abdomen, and w hernia is found it usually explains the symptoms. at times enlargement of the sac is associated though not the cause of, the symptoms—it m filled with pus and an acutely inflamed appendix o food and fluid from a perforated ulcer, or it may c clear fluid from a tuberculous peritonitis, causing t in diagnosis during an exacerbation.

The following case underlines the importance of th beyond the hernia, even when it is irreducible, a thoroughly examining the intra-abdominal portion gut involved, for the hernial sac, containing strang bowel, masked a more serious condition.

A man, aged 76, was admitted to the Bristol Infirmary on the evening of March 23, 1948, with c *abdominal pain and an irreducible hernia which* had painful for six hours. He had vomited several time only stomach contents, and had passed no flatus or since his pain began. The hernia, which had been p for many years, had previously given no trouble and ha readily reducible; there was no history of previous a of abdominal pain, nor of effort, overeating, or dia before the onset of this illness.

The patient did not look ill and did not seem to much pain. His tongue was slightly furred but temperature 98·4°F, pulse-rate 90, and respirations min. There was a rounded, tense, and tender swelli the groin about 3 in. in diameter, which was diagnose strangulated inguinal hernia, with slight general, b localised, distension of the abdomen, and bowel sound heard in all areas. Rectal examination showed on empty rectum. Otherwise no greater abnormality was than would be expected with his years, which he carrie A Ryle's tube was passed into the stomach, but only fluid was drawn off.

Operation was begun, about an hour after adm under local anæsthesia, 75 ml. of 1% procaine being but was continued under general anæsthesia with cyclopr and oxygen, because the patient resented the handli his bowel. The incision was made parallel to the in ligament, and the hernial sac was exposed and opened usual way. It contained cæcum on the right, small and a Meckel's diverticulum on the left, all a mauve c and some bloodstained fluid. The hernia was direct, an opening into the peritoneum large and not constricti bowel. A finger inserted into the peritoneal cavity came on the mesentery of the bowel, which was twisted o

The incision was enlarged laterally by cutting the and the strangulated bowel was delivered. It consis ascending colon and cæcum, on a long mesentery, and 3 ft. of terminal ileum, twisted anticlockwise through The ileum was untwisted, the bowel (which regained its colour) returned to the abdomen, and the wound repai

The patient's condition by this time was not good he had vomited, despite the previous gastric suction. a pint of plasma, given intravenously, there was consid improvement, but next morning he was obviously ill bubbling rhonchi all over his chest. He died 18 hours operation.

Necropsy Findings.—The peritoneal cavity con 100 ml. of foul-smelling brownish fluid; the last $2^1/_2$ small intestine was much congested, with a thin la fibrin on its peritoneal surface; and there was a M diverticulum 2 in. long 2 ft. from the cæcum. The c was congested and grossly œdematous, and the rest large gut was much dilated and congested and cont bloodstained fluid. Both lungs showed gross congestio the right lung early bronchopneumonia in the lower lob

DISCUSSION

Cæcal volvulus without a hernia has often described, but I have been able to find only five publ cases of volvulus of the cæcum associated with h atellani[1] described an example in a woman with a left oral hernia to her knee and symptoms of acute obstruction. sac contained cæcum, ascending colon, and ileum, but wed no obstruction at the neck. Cæcal volvulus was nd post mortem.

ohn's[2] case was in a woman of 65 with a similar condition a very large umbilical hernia. Again there was no obstruc- n at the neck of the sac and the torsion was intra-abdominal, ng a clockwise half-turn (180°). Cohn adds that Billroth l a case with a right inguinal hernia and the bowel twisted ough 360°, and Kaiser one with a right scrotal hernia and bowel rotated through 180°.

Jacobsen[3] reported a case in a man with a very large ht inguinal hernia, who had had recurrent attacks of ere pain for a year before his final illness. The bowel luced itself when the sac was opened at operation, and the vulus was only found post mortem. There was a complete ist (360°) anticlockwise.

These cases illustrate, with the confusing addition of hernia, the types of volvulus usually described:) acute, with symptoms of acute strangulation of the wel; (2) subacute, with a history of some hours or ys, in which the symptoms are moderate only, and in ich distension, which may be localised to the right le together with a visible and palpable swelling, is mmon; and (3) recurrent or chronic, characterised y pain and tenderness in the right side and a varying gree of distension, which is sometimes relieved by the ssage of much flatus.

The present case, apart from its association with a hernia, unusual in that the man was 76 (the usual age being 5–45), in the paucity of symptoms and signs, and in e lack of any predisposing cause such as overeating, xcessive effort, &c.

It is of interest that, as in the previously reported cases, ere was no obstruction at the neck of the hernial sac.

I wish to thank Mr. R. V. Cooke, F.R.C.S., for permission publish this case.

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FATAL CORONARY OCCLUSION IN A GIRL AGED 16

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SINCE coronary occlusion in children is exceedingly are, the following example is of interest.

In February, 1948, a female shop assistant, aged 16, was dmitted to Edinburgh Royal Infirmary under the care of Dr. W. D. D. Small. She had been well until fourteen days reviously, when on hurrying home from work she suddenly eveloped shortness of breath associated with a gripping pain xtending widely across the front of the lower chest and upper bdomen. She was compelled to proceed more slowly, and n resting at home both pain and breathlessness were relieved. Thereafter these symptoms recurred daily whenever she urried, and relief was always obtained with rest. On the enth day after the onset she consulted her doctor but did not ccept his advice to rest at home in bed. That evening she was rather more breathless than usual but obtained complete elief when she went to bed. In the early hours of the following norning she woke up with gross dyspnœa and severe pain n the middle of the sternum. These symptoms continued luring the following thirty-six hours, during which she also ad bouts of vomiting. She was then admitted to the ward.

Previous History.—In September, 1947, she had had an attack of pain in the right iliac fossa associated with vomiting and albuminuria. There was no history of rheumatism, chorea, diphtheria, or scarlet fever.

On examination she was a bright well-nourished girl of average body build, dyspnœic, and cyanosed. The apex-beat was in the sixth intercostal space in the anterior axillary line, heart-rate 130 per min., rhythm regular, and pulsation forcible. A gallop rhythm was audible in all areas, being best heard in the fourth left intercostal space close to the midline. The blood-pressure was 78/54 mm. Hg. Medium crepitations were heard at both lung bases. The liver was not enlarged. Specific gravity of the urine was 1·030, and a trace of albumin was present. Peripheral vessels and ocular fundi were normal. Electrocardiography was not done. Radiography showed much cardiac enlargement and congestive changes at both lung bases, with possibly a small effusion at the right base. There was no peripheral œdema.

Course.—The patient's condition rapidly deteriorated, and she died twenty-four hours after admission.

Necropsy Findings.—The heart weighed 400 g. All its chambers were much dilated, and there was evidence of previous hypertrophy in that the trabecular muscles were thickened, especially on the left side. The heart muscle was pale, soft, and very thin. A large infarct ten to fourteen days old involved the lower part of the interventricular septum, the anterior part of the apices of the left and right ventricles, and the posterior part of the left ventricle. In the upper part of the posterior wall of the left ventricle, towards the base, an extensive area of fibrosis indicated a previous myocardial infarction. At the apices of both ventricles small ante-mortem thrombi were attached to the ventricular wall. The mitral valve admitted three fingers, and no abnormality was present in valve cusps or chordæ tendineæ. In the area of infarction one of the posterior branches of the left coronary artery contained a thrombus. The descending branch of the left coronary artery was carefully dissected, but no area of occlusion, either partial or complete, was found. The lungs were bulky, firm, and very œdematous. There were many small subpleural hæmorrhages in both lungs and one larger hæmorrhagic area in the left lung. In the lung tissue under this large hæmorrhage was a moderate-sized infarct probably two or three days old. On tracing the pulmonary artery to this part of the lung a small ante-mortem thrombus was found. The liver showed chronic venous congestion and many small yellowish areas resembling focal necrosis. No anatomical or pathological abnormalities were found in other organs.

Microscopy of many sections of heart muscle showed areas of infarction of different ages—some less than two hours old, others seven to ten days and one small area of organised infarct more than three months old. Various vessels contained thrombi, and a small section of one of these vessels supplying the area of recent infarction showed a localised acidophil necrotic appearance, with polymorph infiltration. In one of the lung sections recent thrombi were seen in the pulmonary vessels, but the vessel wall showed no sign of necrotic or degenerative change. In the kidneys, intestines, lymph-nodes, liver, spleen, and bone-marrow there was no evidence of primary arterial disease.

DISCUSSION

Evans and Graybiel (1948) discuss a fatal case of coronary occlusion in a girl, aged 18 years 11 months, in which there was hypertensive heart disease and gross arteriosclerosis. Shivelhood (1948) describes infarction in a boy, aged 12 years, who was diabetic from the age of 2 years. The youngest patient in Cassidy's (1946) series of 1000 cases of coronary disease was aged 26, and of Newman's (1946) 50 Service patients with coronary thrombosis the youngest was aged 20.

In the present case the earlier infarct situated towards the base of the heart appears to have developed without the production of classical symptoms; nor did its presence have any adverse effect on physical activity before the onset of the terminal illness. The small area of arterial necrosis, which was considered too pronounced to be purely a response to the thrombosis, was probably a true arteritis and responsible for initiating the thrombosis. In Newman's cases 37 of 39 showed the usual degenerative changes, and in 29 of these there was no thrombosis. Leary (1941), on the other hand, believed that the pathological lesion in the younger group was a subendothelial fibrosis, with necrosis of the intima leading to thrombosis. The present case confirms this view.

I wish to thank Dr. W. D. D. Small for permission to publish, and Dr. A. Cunningham for the pathological report.

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THE LANCET

LONDON: SATURDAY, AUGUST 6, 1949

Splenectomy and the Hæmatologist

INTEREST in splenectomy does not diminish. The chnique of the operation is well enough settled : the bjects for discussion are which patients will benefit om splenectomy, how can they best be chosen, and what cases should removal of an enlarged spleen be fused. In some conditions there is no argument—us for congenital hæmolytic icterus in the young atient splenectomy is the only sensible treatment nd success can be promised with confidence ; and n the other hand no-one nowadays would consider moving a spleen, however large, in chronic myeloid ukæmia. Between these extremes is a debatable eld that is getting larger. BODLEY SCOTT[1] has tely discussed the question from the physician's oint of view. For the surgeons, two series of cases ublished in America well illustrate this expanding eld. LAHEY and NORCROSS,[2] from Boston, Mass., st 83 splenectomies with only 2 deaths—a remarkable chievement, and even these 2, both patients with anti's disease, would not, they think, now be selected or splenectomy. Of their patients, 20 had congenital æmolytic icterus, 4 had splenic cysts, and 4 are lassed as “miscellaneous.” In 25 patients splenecomy was done for congestive splenomegaly and the esults are classed as “good” in no less than 17 of hem : idiopathic thrombocytopenic purpura was the ndication for 17, with 13 good results. Splenectomy as tried in 6 patients with acquired hæmolytic næmia, but in only one was the result satisfactory : was also tried in 7 patients with “panhæmoytopenia” and 5 responded reasonably well. The econd series is reported by COLE and others[3] from hicago. They list 87 cases with 7 operative deaths. of them in cases of Banti's disease, 1 in a patient ith acquired hæmolytic anæmia, and 1 classed as atypical aplastic anæmia.” They also have a large umber of cases of hæmolytic icterus and of thromboytopenic purpura, mostly with good results. In anti's disease, splenectomy was done for 13 cases, ut they have only 2 “good” results. The operation as done in 5 patients with Felty's syndrome (splenoegaly, panhæmocytopenia, and arthritis) ; in 4 he blood picture improved but the arthritis was naffected, while the fifth patient died a year later ith a malignant thymic tumour. They tried plenectomy for other odd cases with somewhat poor esults.

This willingness of surgeons to tackle cases that ot very long ago were thought unsuitable for splenecomy is based on changing views about the function f the spleen. The theory of “hypersplenism” has been much discussed in America, especially by DOAN, DAMESHEK, and their co-workers. This theory suggests that overactivity of the spleen may have a direct effect by an excessive destruction of blood-cells—erythrocytes, granulocytes, or platelets—in the blood passing through the organ ; or it may act remotely by inhibiting the output of these blood-cells from the bone-marrow or by inhibiting their maturation. In either case, hyperplasia of the bone-narrow will result, and, if maturation is disturbed, an undue proportion of early types of cells may be expected. It is here that the hæmatologist plays a part because interpretation and accurate assessment of the bone-marrow picture is needed. Difficulty arises particularly in the purpuras and in so-called splenic neutropenia and splenic panhæmocytopenia. These conditions may be both primary and secondary. Before splenectomy is recommended for them the primary nature of the case should be established, and the bone-marrow must be shown to be hyperplastic. Maturation changes are more debatable—for instance, as we noted in these columns last week (p. 202), most cases of thrombocytopenic purpura show only such changes as might be expected to accompany the hyperplasia. The secondary conditions include Hodgkin's disease, lymphoblastoma, tuberculosis, or Gaucher's disease, or the effects of drugs. LAHEY and NORCROSS have tried splenectomy for some of these, on the view that removal of the overactive spleen will relieve the anæmia and possibly the thrombocytopenia, and have noted at least temporary benefit. The disease variously known as “agnogenic myeloid metaplasia” or myelosclerosis must be excluded—often a difficult job—since in this the spleen takes over blood formation to compensate in part for a failing bone-narrow ; splenectomy, as COLE and others found, is soon fatal. In congestive splenomegaly, opinion for and against splenectomy has varied widely. LAHEY's[4] most recent opinion is that “we may have been too hasty in the past in condemning splenectomy entirely . . . in the early stages we believe that splenectomy still has a real value, unless one feels that an immediate shunt should be done.” COLE and others say that “careful evaluation of the patient . . . is essential and the decision for or against splenectomy is often difficult to make,” but they recommend the operation for any patient fit to stand the strain. BLAKEMORE,[5] however, would restrict splenectomy to cases with obstruction in the splenic vein ; all others should have a porto-caval anastomosis of some kind. These anastomosis operations are not easy, as speakers at the Royal Society of Medicine in January made clear,[6] but more surgeons in this country are learning and applying the technique. Finally, LAHEY and NORCROSS would extend the indications for splenectomy to include any patient who is known to have has an enlarged spleen for six months, has been exhaustively studied by a competent hæmatologist without the cause of the splenomegaly being found, and has no definite contra-indications. Study of these spleens, they rightly say, would do much to increase our knowledge of splenic pathology ; though that, by itself, would of course not justify a major operation in an otherwise fit person.

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How do surgeons find their way through this jungle of difficult diagnosis and still have results like those quoted? The answer is that, if they are wise, they do not try. Lahey is frank about it. "The mortality of splenic diseases for which splenectomy is done," he says,[4] "will be controlled much more largely by the hæmatologist than by the surgeon." Mortality will depend on how well cases are selected by the hæmatologist, who must take the responsibility for determining whether the lesion is primary, or secondary to some condition for which operation would not be helpful. Cole and his colleagues say much the same. The hæmatologist, on whom these surgeons rely, is not a clinical pathologist: he is a physician, a clinician who is capable of making his own assessment and if necessary a personal interpretation of the hæmatological data and material—blood and marrow preparations and so on—in the light of the clinical picture as a whole. In this country hæmatology is often a subdivision of clinical pathology, and, as Piney[7] lately pointed out, we have too few hæmatological physicians and far too few beds are allotted to this specialty. Nevertheless the surgeon can obtain the necessary advice, if he knows where to look for it, possibly in his nearest teaching centre; and the number of splenectomies done in the dark, without benefit of hæmatologist, should steadily diminish.

Hearing-aids

The undertaking to supply a well-made, serviceable hearing-aid to every man, woman, or child in the country who needs it illustrates the new effort to ensure that the benefits of medicine are accessible to all. If there are objections to the instrument offered —the 'Medresco' hearing-aid—they cannot be stated too soon. On the other hand, they will never come too late; for the medresco is not an immutable structure and it is in process of development: mark II, now being manufactured, already shows improvements on the original design. Meanwhile it is interesting to know that both the research unit at Harvard University and the Medical Research Council's committee on electro-acoustics conclude that it is possible to produce a standard aid which will suit the very large majority of deaf people as well as any commercial aids on the market.

Steps have already been taken to meet some of the complaints about the medresco aid which have lately been published in a leaflet addressed to Members of Parliament by the British Association for the Hard of Hearing (B.A.H.H.). The leaflet asks why the aids were fitted with the "plug-in" type of earpiece, from which the rubber nipple is apt to detach itself and remain stuck in the meatus; but arrangements have now been made to overcome this difficulty by fitting individual inserts. It seems that many of the aids sent out until recently had loose switches, and made a grating noise when the volume control was used; but we are told that these defects, too, have been overcome in the mark II instruments. The B.A.H.H. further suggest that a test at the factory by an experienced user of aids would have saved many people from having to return their instruments—sometimes two or three times—for correction. Some clinics are now undertaking minor repairs and saving users this awkward necessity. But in case a test by a user of aids would not safeguar deaf from flaws in the instrument. Such tests sl be objective not subjective, depending on mea ment not opinion. A scientific test is of c carried out before the instrument leaves factory.

Users have from the start complained of the w of the batteries, packed in their solid leather case. case must be costly, and is felt to be unneces for, if the wire between the batteries were lo men could distribute them in their pockets, women in a suitable waist-belt.) Large bat were chosen, as was explained at the outset, so users need only renew them at long intervals; this advantage may well be offset by the w The B.A.H.H. also claim that medresco aids are issued to patients with nerve deafness who harmed by the use of an electrical hearing-aid. latter point is more controversial, and the evi does not seem to be clear. Children with deafness are not made worse by an electrical on the contrary, their hearing improves because aid enables them to learn *how* to hear. Adults no exact measure of hearing in their heads: they put on an aid they are astonished to find it is like to hear properly: they have forgotten sensation. When they remove the aid they equally astonished to find how badly they hear. is hard to make a critical judgment in such cir stances and they are apt to believe that their hea is worse than it was before they used the aid. thus natural to blame the aid for a supposed deter tion of hearing. On the other hand, a damaged n may conceivably tire more readily than a no one, and the hearing-aid might thus be floggi tired horse, even to the point of injury. The ques could be answered by appropriate investigation, until there is objective evidence of damage it sh not be pressed as an objection to the aid.

More serious, perhaps, is the allegation that aids are relatively scarce. Up to this July 27 had been issued by the Ministry,[1] but the B.A. estimate that some 150,000 are needed. At pre the clinics are crowded, and waiting-lists have mounting steadily. We have heard of one where it has been necessary to close the waiting for the time being, and there is no prospect reopening it for nine months. This situation m however, be seen in perspective. It is a wast time and money to give people aids without at same time giving them proper training in their The present crisis is transient: in time ever will be fitted, and the pressure on the clinics subside. There are not enough trained people t aids faster than is being done at present; bu would hardly be worth training large number meet the present strain on the clinics, since t services would soon become redundant. The who have waited so long for this piece of service, be patient a year or so if the situation is expla to them.

The B.A.H.H. express a fear that the produc of hearing-aids may become a Government monop

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7. Piney, A. *Lancet*, 1949, i, 1023.

1. See *Lancet*, July 16, p. 137.

t it has already been responsibly stated that the vernment do not intend to take over the industry. d this will go some way to safeguard existing users commercial hearing-aids. who will still be able to adjustments and repairs done by the makers. It ms that. before the National Health Service was mched. any person who was hard of hearing could adily get an appointment at a hospital clinic where would be examined by a consultant: if his case emed likely to benefit by an aid he would then try rious kinds. decide which he preferred. and be ven a note from the hospital to have one like it a week's trial. If he bought it, he was given 25% scount. The association hoped this service would continued alongside the issue of the medresco aid. it there are obvious objections to such an arrangement. The medresco is a sound workmanlike job. out the most powerful instrument for its size at esent manufactured; but it is designed to suit the r. not to attract the eye. Commercial aids often ok neater. and some of the 90% or so of patients ho would be suited by a medresco might think nother model preferable on grounds of appearance ly. The deaf have sometimes been treated very fairly in the past. and an important aim of the edresco aid is to protect users against exploitation. or would it be justifiable just now to use the limited ained staff in the clinics to fit commercial aids. s we have said already. careful training of the user s essential with any kind of aid, and it is important hat it should be begun in the right atmosphere: for hough it is simple to measure the effect of an aid n the patient's hearing. it may be difficult to make im realise its full value. Hearing. like other sensations. can only be appreciated subjectively. and motional factors inevitably influence a patient's pinion of his hearing-aid: none so deaf as he who hinks his aid a failure in advance.

Experiments on Animals

MOST people in Great Britain regard laboratory xperiments on animals as an unpleasant necessity. hey accept the practice because so much good has ome of it: but they have ensured by legislation that shall be used as sparingly as possible, kept in the ands of those believed to be humane and responsible. nd safeguarded by legal restrictions from abuse. his position has not been reached by following any principle to its logical conclusion. Indeed, principles arried to that extreme. and then used as rules of onduct, often prove cruel or silly or both. Clearly t is as wrong to let a child die unnecessarily of diphheria as it is to regard all animals as a lower creation lesigned to suffer for the benefit of man. Though oth attitudes can be justified on principle. both offend our humanity. We are thus compelled to reat this like other moral dilemmas. and pick our way uneasily along a middle course. never wholly at peace with our consciences. but at least sparing them the final outrage of one gross evil or the other.

Certainly the compromise owes nothing to callousness. As long ago as 1871 the British Association for the Advancement of Science resolved that no experiment which can be done under an anæsthetic should be done without it: that no painful experiment is justifiable for the mere purpose of illustrating a law or fact already demonstrated (i.e.. such experiments should not be used in teaching); and that when, to obtain a new fact. it is necessary to undertake a painful experiment. every effort should be made to ensure success. so that pain is not inflicted uselessly. The Cruelty to Animals Act of 1876 was founded on this outline: it obliges those who wish to conduct painful experiments. or " any procedure calculated to interfere with the normal health and comfort of an animal," to obtain a licence from the Home Secretary; and it further requires that an animal suffering from severe pain which is likely to endure should forthwith be painlessly killed. whether the main object of the experiment has been attained or not. Moreover, there is now a well-grown opinion among scientists that animals should not be used in large numbers for painful experiments if the facts can be established equally well by the use of a few. Within this frame of regulations and customs it is possible to limit painful experiments to a very small proportion of experiments as a whole. and to ensure that the suffering experienced is not severe or prolonged.

In other Western European countries. and in America. though most scientists doubtless impose on themselves the same humane scale of values. there are not the same stringent legal safeguards. It will always happen that the tough-minded and the tender-minded will differ over what constitutes suffering for others. whether humans or animals. and there will thus always be a scatter round the mean of ordinary practice in the conduct of experiments. But there may also be examples at which the average laboratory worker and the ordinary citizen alike revolt, as is shown in our correspondence columns this week. CHARLES DARWIN held that to inflict any pain which is not absolutely necessary deserves " detestation and abhorrence." and all research-workers of integrity subscribe to this judgment. They know that to apply the criterion of necessity calls for unremitting care and attention: but they also know that it can and must be done. Since the pursuit of a new fact can sometimes engross the mind almost completely, they recognise that they must always be on guard: and that wherever their keenness may have impaired their sense of proportion they should seek the help and criticism of colleagues. In the cases cited by our correspondents the essential criterion was not applied.

The Membership

Two years ago an article on Satisfying the Examiner advised M.R.C.P. candidates to:

> Read up to date reviews of medicine and allied subjects. Get the latest copies of *Physiological Reviews*, *Medicine* (Baltimore), the *Quarterly Journal of Medicine*, and other quarterly journals in special subjects. Read *Abstracts of World Medicine*, annotations in *The Lancet*, and the lectures delivered at the college right up to the date of the examination.

So long as examiners felt that they were testing the candidate's fitness to practise immediately as a consultant, quite abstruse questions could be legitimate. But the Royal College of Physicians last week accepted a report (published on p. 252) which states that " membership of the college should signify a knowledge of general medicine that justifies further training as a consultant " and that the examination is best taken early in training. Without proposing radical changes, the report makes valuable recommendations for the conduct of the examination and entry to it. There is no question of lowering its standard; but the clearer definition of its scope. and the other new arrangements. will enable the sound candidate to approach it with more confidence.

Annotations

NEGOTIATION AT LAST

AT the beginning of March the medical journals ceased to accept advertisements from local authorities for public-health appointments. As we explained at the time,[1] this action was taken because the local-authority associations were showing no disposition to enter a Medical Whitley Council and discuss new scales of remuneration for doctors in the public-health service. In the light of the two medical Spens reports, the Society of Medical Officers of Health and the British Medical Association had decided that the revised Askwith scales, as modified in January, 1948, were no longer appropriate; and since the Askwith agreement had thus in effect been terminated we took the view that advertisements could not usefully appear in our columns until negotiations for a new agreement were opened.

For reasons which we mentioned, the local-authority organisations had misgivings about taking any active part in a Medical Whitley Council; and most of them would still prefer the establishment of separate councils. After a meeting last week, however, they told the Ministry of Health that (except for the Scottish associations, whose representatives could do no more than recommend) all of them were

> "prepared to participate in the proposed Medical Functional Council provided that its constitution is so drawn and agreed as to provide for the remuneration and conditions of service of medical practitioners employed by or in contract with local authorities being decided finally by a separate committee without need for confirmation by, but subject to report to, the Functional Council."

This means that the local-authority associations are now willing to enter into negotiations under Whitley arrangements: and, with the rest of the medical press, we are happy to resume publication of local-authority advertisements this week. It is assumed that, as before, the remuneration offered will conform to the revised Askwith scale as modified in January, 1948, and that no distinction will be made between the payment of men and women doctors.

The British Medical Association's draft scales, which will now presumably be brought forward for discussion, were summarised in our issue of Jan. 29.

ELECTRICAL ANÆSTHESIA

THE production of surgical anæsthesia by electrical means has long been an intriguing possibility. It was d'Arsonval in 1890 who first noticed that high-frequency currents could produce anæsthesia, and a great deal of experimental work has since been published on the subject. Longley,[2] of the Burden Neurological Institute at Bristol, has welded this mass of writings together, adding the results of his own experiments. Four well-defined types of anæsthesia can be produced electrically—local, spinal, spinal plus general, and general. Robinovitch[3] was the pioneer of the first; direct current interrupted 100 times a second, with a duration of pulse of 1/1000 sec. is used, both anode and cathode being applied to the nerve-trunks. For spinal anæsthesia either direct or interrupted direct current is applied between the spine and some other part of the body, usually the neck. In animals tonic immobility is produced, but the method did not show great promise in animal experiments and has not been used in man. Spinal plus general anæsthesia is the type produced by Leduc's[4] technique. An interrupted direct current is applied between the loins and the head; animals become motionless and apparently deeply asl
Leduc was so enthusiastic that he submitted him
to such a procedure and recorded his observations.
reported that he became completely paralysed
insensitive to pain, though consciousness was o
dimmed. His colleagues, however, did not carry
experiment to the limits he had intended, and Le
maintained that had they done so complete unc
sciousness would have resulted. General anæsth
is produced by passing a current through the h
and under the name of "electric stunning" this t
nique is commonly used in abattoirs before slaught
the principle is the same as in the electronarcosis t
ment of mental diseases.[5] There is still doubt whe
true general anæsthesia—a reversible and controlla
immobility with loss of consciousness—can in fact
produced electrically. Many workers contend that o
a generalised immobility akin to that of curarisation
obtained, and such criticism is difficult to refute si
relatively few experiments have been conducted
man. It seems likely however that, with the present-d
elaboration and extension of electronic methods, advan
will yet take place in this field.

CONSERVATIVE TREATMENT OF INTUSSUSCEPTION

REDUCTION of an intussusception by pressure of fl
introduced through the rectum has been practis
notably in Australia and Scandinavia, for many yea
It has an obvious appeal, but the fear of rupturing t
damaged gut has discouraged most British surge
from adopting the method. Two recent papers emphas
its relative safety. Nelson,[6] of Sydney, N.S.W., u
the technique elaborated in Australia by Hipsle
In an ill patient the procedure is liable to cause sho
and Nelson advises that it should be carried out und
anæsthesia deep enough to give complete abdomi
relaxation. He also does the reduction in a room ne
the theatre, so that if operation is necessary there w
be no delay. Saline is run into the rectum through
no. 15 catheter passed about 3 in. into the bowel a
retained by a firm grip of the buttocks. The height
the fluid reservoir is 3 ft. As the fluid is introduced
runs at first rapidly and then more slowly. The press
is maintained for 2–3 minutes and the fluid is th
allowed to return. The procedure can be repeated t
or three times. Successful reduction is diagnos
clinically and if there is any doubt it must be confirm
by an exploratory incision at McBurney's point. Wi
this fixed degree of hydrostatic pressure there is said t
be no danger of rupturing the bowel; but Nelson doe
not recommend the method in cases admitted to hospit
more than 24 hours after the onset. In complete
successful cases, the fluid passes the ileocæcal val
and flows into the small intestine. The uniform d
tension of the abdominal cavity which results is the mo
definite sign of reduction. If the fluid is held up
contraction of the ileocæcal sphincter an indefinite swe
ing may be felt in the right iliac fossa, and explorati
through a small incision may be necessary to confi
or complete the reduction. In 102 patients, all und
2 years of age, hydrostatic pressure was used in t
majority as a substitute for or preliminary to operati
In 20 cases the intussusception was reduced witho
operation, and in a further 23 cases it was found reduc
at operation. Of the 10 patients who died, only 4 we
treated within 24 hours of onset; the remainder we
not admitted to hospital until 32 hours to 3 days af
onset.

Lindberg and Morales,[8] of Norrköping, Swed
describe afresh the Scandinavian method in whi

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[1] *Lancet*, 1949, i, 402.
[2] Longley, E. O. *J. ment. Sci.* 1949, 95, 51.
[3] Robinovitch, L. S. See Anesthesia, by J. T. Gwathmey. New York, 1914; chap. 14.
[4] Leduc, S. *Arch. Elect. méd.* 1902, 10, 769.
[5] Paterson, A. S., Milligan, W. L. *Lancet*, 1947, ii, 198.
[6] Nelson, T. Y. *Med. J. Aust.* 1949, i, 825.
[7] Hipsley, P. L. *Ibid*, 1926, ii, 201.
[8] Lindberg, G., Morales, O. *Amer. J. Dis. Child.* 1949, 77, 30

dio-opaque enema is given and the intussusception duced under direct vision on the fluorescent screen. examiner controls the flow of the medium by means clip on the rubber tubing and the height of the rvoir is about 5 ft. They have used 'Pharmabaryt' % barium sulphate and 2% indifferent colloids) an opaque medium. The immediate effect of the l is to stimulate the colon to contract and push back enema. The flow is stopped until the bowel relaxes is then renewed. Reduction is judged complete only n the fluid is seen to flow freely into the small intestine. far as possible manual reduction is avoided; but if, often happens, a lump the size of a walnut can still be in the cæcal region, the cæcum is held in one hand and sage performed upwards with the other. In 3 of the consecutive cases reported reduction was still incom- e, and the procedure was repeated under general esthesia, but all 18 were successfully reduced in the . In other cases operation has occasionally been orted to, and no complication from the enema treat- nt has ever been found on opening the abdomen. dberg and Morales attribute their success largely to early stage and good condition in which the patients re referred to hospital. Their patients were all under years of age, and they believe that reduction by ma is easier in very young children.

Considering the good results obtained by early opera- n in intussusception, it is understandable that surgeons itate to adopt any method of treatment that will nd between the patient and immediate laparotomy. t if preparations for operation are made before- nd and the procedure is carried out in or near the eatre, a trial enema will scarcely delay operation at all, d under these circumstances Hamilton Bailey[9] recom- nds its wider use. The opaque enema seems more isonable than the blind introduction of saline.

THE LOCK HOSPITAL

THE controversy over the closure of the Lock Hospital ludes two separate issues, tactical and strategic. n the tactical level the question is simply whether the edical interests of the inhabitants of London are best rved by maintaining a hospital in Soho for the treat- ent of venereal diseases, or by using its premises for urological cases for which there is a shortage of beds. is is exactly the sort of problem that the regional spital boards were set up to solve, so that our hospitals all be used to full advantage; and they must not be evented from doing their duty by the fact that all such cisions are bound to cause pain to doctors who have orked for "redundant" hospitals and patients who ve been in the habit of attending them. We cannot lp thinking, however, that the North-Western Regional ospital Board, in making and reaffirming its decision, is been influenced by the strategic argument that nereology is, or is rapidly becoming, an obsolete ecialty, and that special hospitals for venereal diseases e outmoded. How far is this argument sound? There is always been something odd about linking two such verse diseases as syphilis and gonorrhœa merely because ey are spread by the same means: the one seemed to long to urology and the other to internal medicine; d now that both are so vulnerable to chemotherapy any believe that the time has come to stop segregating em and the doctors who treat them. This view is rongly contested, however, by venereologists, who elieve that venereal diseases, presenting special psycho- gical and epidemiological problems are well treated only by eople who study them intensively: they say, with good eason, that treatment with antibiotics is at a stage when uch knowledge and good judgment are required,[10] nd they very rightly point out that venereal diseases are still doing enormous damage at home and abroad. It is for these reasons that thirteen teachers of venereology, writing in the *Times* of July 27, plead that London should have a centre for postgraduate teaching and research to provide the trained men and women still needed in this specialty, especially in Colonial territories: and they urge that the Lock Hospital should be used for this purpose. On this strategic level it is by no means easy to accept the decision of a regional board as final, unless at least it is known to have the concurrence of the authorities concerned with postgraduate education and the needs of the medical services overseas.

DOMICILIARY CARE IN OXFORDSHIRE

THE idea of bringing hospital care into the home has much to recommend it. Many old people and chronic sick, who when they are admitted to hospital are likely to occupy beds for long periods, are particularly well suited for home care. A scheme for providing such care was lately started by Addenbrooke's Hospital,[1] Cambridge; and St. Helier Hospital, Carshalton, has a scheme for the home care of old people. Now the Oxford regional hospital board hopes to launch at Swindon a more extensive experiment. Dr. John Lowe, chairman of the chronic-sick subcommittee of the board, is to make a pilot survey of institutions in the region and has already analysed the cases in St. Margaret's Hospital and Welfare Home at Stratton, of which he is medical superintendent.

The hospital and home are joint users of premises which were originally a public-assistance institution, part of which has been taken over by the public-health department. The hospital has 236 beds, 108 of them for chronic cases; and the welfare home takes 150 residents. The hospital is under the Swindon and district hospital management committee, while the home is under the Wiltshire county welfare committee, who, it is hoped will help to operate a joint scheme. One part of the plan is to increase the number of beds for the chronic sick by exchanging the welfare home with the isolation hospital. The 80 beds in the isolation hospital are seldom used, and it is felt that these would suffice for a residential home, provided a scheme of domiciliary care was arranged at the same time. The 150 beds in the present country home would better serve the needs of patients who must have active medical or nursing care.

The crux of the whole plan of course is the domiciliary scheme. This, the board point out, must integrate the arrangements for the chronic sick under the various parts of the Act. Chronic sick in hospital come under the regional hospital board; those in house, residential home, or hostel, under the local authorities, who are also responsible for health visiting, home nursing, care and aftercare in illness, and domestic help; while general-practitioner service to the patient at home comes under the executive council. The board suggest that all these services might be integrated under a new officer, a senior clinician, who would work in close touch with the medical officers of health, the general practitioners, the "four aitches" (home, hospital, residential home, and hostel), and the various voluntary organisations. He would be on the staff of the general hospital and responsible for inpatient treatment. Under such a system appropriate cases could be given priority on medical and social grounds; and when a patient was discharged from hospital continuous care could be arranged for him, whether he went to his own home or into a residential home or hostel. Complete responsibility for the chronic sick would thus come under a single organisation, and the care given would include the services of the almoner, health visitor, district nurse, and home help: the loan of hospital equipment when necessary; and special arrangements for catering, laundry, and transport. The board also hope to set up special clinics for old people, for the diagnosis and early treatment of degenerative conditions. Dr. Lowe's analysis of the 138 patients now in the welfare home shows that they are there largely for social reasons—because they are widowed, or have lost their homes, or are awaiting a council house. Of the 36 women and 71 men in St. Margaret's Hospital nearly all need treatment, and there is a long waiting-list. The new scheme should ensure better care for far larger numbers. We wish it every success.

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[9] Bailey, H. Emergency Surgery. Bristol, 1944; p. 293.

[10] See *Lancet*, 1949, i, 1009.

[1] See *Lancet*, 1949, i, 618.

PITUITARY EXTRACT IN RADIOLOGY

Intestinal shadows militate against good X-ray pictures of the gall-bladder and kidney. In 1936 Collins and Root[1] recommended the use of 'Pitressin,' the pressor principle of the posterior pituitary, to stimulate bowel activity and hence aid in the elimination of gas. Since then pitressin has been widely used by radiologists to prepare patients for cholecystography and pyelography. In some countries this is apparently done as a routine, but here the procedure is normally reserved for cases where gas shadows have actually obscured the diagnosis in preliminary films. Mills and others[2] have lately reported two instances of prolonged myocardial ischæmia and two sudden deaths that have occurred at the Mayo Clinic after the use of pitressin for this purpose. They consider that there was a causal relationship between the administration of the drug and the untoward incidents and recommend that it should only be employed with the utmost discretion. Minor unpleasant reactions to pitressin are familiar and have been reviewed by Kirklin and Seedorf.[3] These include nausea, faintness, and abdominal cramps; but in spite of its wide and varied use over many years there has been only one previous account of a serious reaction, and this followed a water-pitressin test for epilepsy.[4] It is well known that pitressin is a powerful vasoconstrictor of the coronary arteries,[5] and in patients with coronary disease changes in the electrocardiogram similar to those of anoxia have been produced.[6] In view of these changes Ruskin[7] suggested the injection of pitressin as a test for latent coronary insufficiency and in particular to differentiate angina pectoris from other chest pains. He found a close parallelism with the exercise-tolerance test but did not advise the general adoption of his pitressin test because of possible side-effects. In his patients the only reactions were gagging, occasional slight vomiting, slight abdominal cramps, or an uncontrollable desire to pass urine or fæces.

Before condemning the pitressin technique of gas-removal, which has a definite if limited place in radiology, it would be well to examine the evidence in detail. Pitressin has been used in tens of thousands of cases and this is the first warning which has appeared. The Mayo Clinic cases are not altogether convincing, and the writers of the report themselves studied the E.C.G. changes after pitressin in 100 consecutive patients without finding any reaction or significant abnormality. Of their four possible examples of severe reactions, the first patient experienced substernal pain of ischæmic type $1^{1}/_{2}$ hours after the injection of 1 ml. (10 pressor units) of pitressin. The pain recurred on and off during the next 8 days and was followed by a severe attack on the 11th day with E.C.G. changes of infarction. He quently recovered. The second patient died at hours after the injection, and necropsy showed coronary sclerosis with evidence of old occlusion recent infarction. The third patient was found 20 minutes after his injection, but there was no mortem examination. An E.C.G. taken 2 days befo shown multiple ventricular extra-systoles but no abnormality. The fourth patient had previously s from angina and collapsed 4 hours after his inj The E.C.G. taken subsequently did not reveal any c teristic pattern of infarction, but he died on the 8t during an attack of pain, and terminal vent fibrillation was recorded. Necropsy showed evide old but not recent infarction. Reactions to pit usually occur within a few minutes of the injectio Ruskin noted that E.C.G. changes produced by pit as a test for coronary insufficiency occurred within minutes and reverted to normal within 10–15 mi It may therefore be doubted whether the reactio the Mayo Clinic cases were necessarily due to the tion, though the possibility cannot be ignored. Pe the wise conclusion is that pitressin should not be as a routine but only when specifically indicated, an in patients known to have had ischæmic pain or evi of coronary disease. There are other simple metho dealing with gas.

GIFT FOR ORTHOPÆDICS AT OXFORD

Lord Nuffield has given £50,000 to the Nuffield O pædic Centre at Oxford. The centre has two responsibilities—first, the treatment of its patien the Wingfield-Morris Orthopædic Hospital; and seco postgraduate training. The gift is to be put at disposal of trustees for the use of the centre. fund will not relieve the regional hospital board an university of their obligations to the hospital and department; but it will enable the centre to offer sp facilities to the orthopædic surgeons and postgrad students who come from all parts of the Commonwe

COMMITTEE ON HOSPITAL ADMINISTRATI

The Central Health Services Council has appoi a committee:

(1) To review the organisation of the hospital ser under the National Health Service Act, 1946, but not ma concerning the administration of individual hospitals, an make recommendations;

(2) To frame detailed terms of reference for a commi on the administration of individual hospitals.

The members are: Mr. F. Messer, M.P., chairman the council (chairman); Sir Harold Wernher (v chairman); Mr. E. C. F. Bird; Alderman Bradb Mr. F. J. Cable, F.H.A.; Sir Allen Daley, F.R.C Mr. S. C. Fryers, F.H.A.; the Hon. A. J. P. Hov M.P.; Mr. R. A. Mickelwright, F.H.A.; Sir Owen M head; and Dr. W. G. Patterson. The joint secretaries Mr. E. J. S. Clarke and Mr. E. W. Bryant of the Mini of Health.

Dr. T. Stacey Wilson, consulting physician Birmingham United Hospitals, died on July 30, at age of 80.

Dr. J. M. Mackintosh has resigned his appointn as dean of the London School of Hygiene and Trop Medicine as from the end of this year. He will conti to occupy the chair of public health at the school.

We understand that a committee formed jointly the Institute of Professional Civil Servants, the Mini of Health Medical Staff Association, and the Bri Medical Association has submitted to the Treas proposals for revision of the scales of salary of med men and women in the Civil Service.

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Points of View

THE DOCTOR'S PROFESSION*

1. The Doctor as Technician

many doctors—and their number includes some might claim to be Christians—the profession edicine is essentially the practice of a technique or , operating along well-recognised lines. In so far as moral considerations arise in it, they are concerned with the doctor's faithfulness to the laws of his nique, of which he is the best judge. Why trouble member of an already overworked profession with ters which are both extremely complicated and emely controversial in themselves and make no rence anyway to 99 out of 100 decisions which the age doctor has to make ?

his attitude needs careful examination, even though ay be held very confusedly by some of its exponents. use up to a point there is obviously a great deal of h in it. It is clear that a large amount of medical tice is a matter of the application of a technique ch can be learnt in fundamentally the same way as t of, say, an engineer. Doctors are practical men, have learnt a method of treating disease based on ory-taking and the eliciting of physical signs, and en the results of this examination) who possess a ly distinct system of actions appropriate to the result the examination. It is not too much to call this a chnique," as indeed anything which is the object of ctice and experience is bound to become. To expect octor, every time he is faced with a case of coronary ombosis, to recapitulate in his thinking the whole elopment of the profession's views about the disease, idiculous ; he is bound to put into practice for the st part the rules of treatment which he learnt as a dent and which he has modified in his own experience. en the "bedside manner" in its best form must be nitted to be largely a "technique": few doctors uld care to maintain that their thoughts about their tients are perfectly represented by their manner! is is not to say that this is wrong—on the contrary it obviously a great advantage if a doctor can economise energies by diverting as much of his activities along ple routine lines as possible. All we are concerned to intain for the moment is that the doctor can be arded as practising a technique, and, in that sense ly, can be regarded as a "technician."

MORE THAN A TECHNICIAN ?

Thus far there is little cause for disagreement. The vergence appears, of course, when it is asserted that e doctor need not consider himself as being anything re than a technician. Here, not only the Christian t, as we shall see, the classic tradition of medical actice itself, must take issue with the doctor-technician.

There is some difficulty in defining this attitude. though it has obvious affinities with philosophical turalism, it is not so precise as that and has had no herent exposition in the history of medicine. For that atter, there have been very few philosophers of medicine any kind since Sir Thomas Browne. But even if it generally undefined and implicit, this is nevertheless a idespread and formidable attitude in the profession today. It is that of the doctor who prides himself on his practicality and on being more interested in what he can do now on the strictly medical level than in what he would describe as vague and often irrelevant issues. It also makes such a doctor assume, whether consistently or not, that, while genetic and social and psychological and economic factors may have a right to be considered in medical practice and education, moral and spiritual factors can safely be ruled out and that they need be no concern of his. Indeed, he often suggests that it is an unwarrantable interference with the autonomy of the profession to suggest that they have, especially if the suggestion comes from the clergy.

It is worth examining this attitude closely, even if it is undefined, because, as in a practical working philosophy, it appears to be the only serious rival to the one maintained in these essays. (Socialist medical thought, which might be considered from some points of view to offer itself as yet another influential medical philosophy, can hardly claim to be that, as so far it has concerned itself simply with suggesting specific ways in which the organisation of medical research and practice might be improved.) It is important also that full justice should be done to this attitude, and that for two reasons. The first is that those who hold it strongly suspect Christians of special pleading in relation to it and of being more concerned to prove the relevance of their peculiar beliefs to medicine than to deal faithfully with all the facts. The second reason is that, as we have already recognised, up to a point there is a great deal of justice in the view that the doctor is primarily a technician, and it is important for their own understanding of the medical vocation that Christians should make full allowance for it.

First, then, let it be freely recognised that no-one wishes to assert that medical technique is anything but a highly complicated one. No-one would want to assert that the doctor's work is on a level with that of a garage-hand or that the human constitution can be as easily handled as a motor-car. All that is claimed is that, although the responsibility of the doctor to the patient may be infinitely greater in degree than that of the garage-hand to the car, it is not ultimately radically different in kind. That there is a substantial element of truth in the claim is obvious.

Secondly, it does not follow that the doctor who maintains that he is no more than a technician necessarily holds his profession in low esteem or is prompted only by motives of personal advancement. The reverse is often the case. It is true that it is possible to attain to considerable wealth and prestige through the practice of medicine, but it is far from being the easiest of roads open to those whose primary goal is to get rich and famous quick. Every doctor has to undergo a long and exacting training, and the outstandingly successful doctor is rarely able to achieve his eminence by any other means than those of exceptional ability and disciplined application under the constant eye of intensely critical colleagues. Even the laziest and most indifferent person who strays into medicine cannot escape performing a considerable amount of skilled and useful work and accepting heavy responsibilities under conditions of frequent inconvenience and unpleasantness. Any criticisms made of the attitude of some doctors towards their profession must be tempered, therefore, by a generous recognition that even if they do regard themselves only as technicians they are technicians of a very high order, bearing peculiarly arduous technical responsibilities.

Nor, thirdly, need it be maintained that the doctor who regards himself primarily as a technician is a philistine. He may see himself as a humble partner in a great enterprise of coöperative research and practice, grateful for the inspiring privilege of belonging to a profession which has produced so many great men and

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Four essays arising from discussions held under the auspices of The Christian Frontier Council (8, The Cloisters, Windsor Castle). For permission to print them we are indebted to the Student Christian Movement Press Ltd. (58, Bloomsbury Street, W.C.1) which is shortly publishing them in full, with others, under the title *The Doctor's Profession*. This book is likely to appear in October, and the probable price is 4*s*. 6*d*.

so many beneficent discoveries and which has achieved such a high degree of skill in the fulfilment of its technique. There is not necessarily any lack of very high professional standards along certain lines among those who take this attitude. This becomes the more clear when it is borne in mind that most medical advance has been made largely under the impetus of the development of the profession itself rather than through any outside agency. It is incorrect to assert, as some unsympathetic partisans do, that medical advances have been made only in the teeth of ecclesiastical obscurantism, but it can hardly be claimed, on the other hand, that many of them are the direct result of Christian inspiration. A very good case can be made out, as Prof. A. N. Whitehead has shown in *Science and the Modern World*, for the claim that modern science itself could only have arisen out of a Christian attitude towards life which believed in the rationality of the universe; but it has to be allowed that that is not a truth which is immediately obvious to a busy technician who has little knowledge of cultural history and who takes things as he finds them today.

Fourthly, the doctor-technician will argue that in medicine knowledge is more important than good intentions. This has always been so and it becomes increasingly true as medical science advances and as a cure comes to depend more and more upon an accurate diagnosis rather than upon incalculable fortune. Surely, therefore, it is more important that the limited mental energy of the doctor should be spent on acquiring this ever-expanding body of knowledge than on pursuits of dubious usefulness which are extraneous to his work. The man who reads theology and exercises himself over religious matters is likely to be diverted from giving his full energy to reading medicine and concerning himself with his patients. The frequency with which the advice is given to the young doctor to concentrate on his work and marry late indicates how difficult it is for the man of average ability to do anything apart from his work with any degree of serious application. Why jeopardise one's professional chances and possibly damage one's technical competence by introducing powerful and distracting non-professional influences like religion into one's work? This may seem to the Christian to beg the question both of the real nature of knowledge and the precise character of religion (is it primarily a matter of good intentions?) but it is certainly a widely held point of view, which demands to be met.

LIMITING RESPONSIBILITIES

On a deeper level, it may be contended that so far as any ethical decisions are required in actual practice, they are the patient's own concern, and it is an intolerable burden that they should be wished on to the doctor. To do so is likely to place the doctor in complicated situations he would do well to avoid. Besides, ethical decisions taken by the doctor must frequently involve not merely a refusal to take a certain line of action but a decision to take a definite line of action and to persuade the patient to take it also. Thus the doctor changes from disinterested servant to active propagandist, with obvious dangers to the confidence with which he can be regarded by the patient. This is undoubtedly a consideration of great weight. The doctor can very easily persuade himself that he knows what is good for the patient in all branches of his life and assume that he, the great healer, has dictatorial powers over the patient. The reverence in which the doctor is held by some patients and their readiness to depend upon him makes this all the more dangerous.

Nevertheless, the way to overcome this danger is not simply to pretend that the personal factor, with all its moral and spiritual implications, does not exist in medicine. The doctor-technician can hardly cons *maintain that the personal factor is of no* acco he has a constant interest in minimising its impo And because he refuses to admit that he need ha clearly defined principles to guide him in this rea deals with any moral and spiritual issue either uncritical acceptance of conventional standards doing what is most convenient and least troubleso himself. Thus he is able to persuade himself tha is no relationship which is likely to arise in his w which he will not be able to work out a technique will allow him to negotiate it without undu commitment. His ideal, even though he ma prepared to admit that in an imperfect world h not always be able to reach it, is to achieve a mec simplicity and objectivity in dealing with his pati

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> I swear by Apollo, the physician, and Æsculapiu Health, and All-heal, and all the gods and goddesses according to my ability and judgment, I will keep thi and this stipulation—to reckon him who taught m Art equally dear to me as my parents, to share my su with him, and relieve his necessities if required; t upon his offspring in the same footing as my own br and to teach them this art, if they shall wish to le without fee or stipulation; and that by precept, l and every other mode of instruction, I will impart a kno of the Art to my own sons, and those of my teacher to disciples bound by a stipulation and oath accord the law of medicine, but to none others.
>
> I will follow that system of regimen which, accord my ability and judgment, I consider for the benefit patients, and abstain from whatever is deleteriou mischievous.
>
> I will give no deadly medicine to any one if aske suggest any such counsel; and in like manner I wi give to a woman a pessary to produce abortion.
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> I will not cut persons labouring under the stone, bu leave this to be done by men who are practitioners o work.
>
> Into whatever houses I enter, I will go into them f benefit of the sick, and will abstain from every volu act of mischief and corruption; and, further, fro seduction of females or males, of freemen and slaves.
>
> Whatever, in connexion with my professional prac not in connexion with it, I see or hear, in the life o which ought not to be spoken of abroad, I will not di as reckoning that all such should be kept secret.
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Most of the first sentence and the fifth are, of co profoundly different in their application now. Bu regarding these, what of the remainder is left, medicine has no sanction outside itself, when thera abortion and terminal narcosis are permissible, "pure" and "holy" are epithets far less esteem the profession than "courageous," "distinguished "prosperous"? The indenture of the doctor-techn runs, one might say:

> I will practise medicine according to my ability judgment. I will produce abortion, expedite death, kill the newly born when it is medically desirable. respect the confidence of my patients, and will adhe society's conventions in my relations with them. *If I su* in these undertakings I expect to be prosperous and respe if not, to be a failure and struck off the register.

is is something of a caricature ; yet the contrast is ient to illustrate the point we wish to make—that cine on these terms is inadequate medicine.

THE CHRISTIAN ATTITUDE

this matter, as may be expected, the Christian take his stand on the classic tradition of medicine condemn the inadequacy of the doctor-technician's oach. At the same time, it is unfortunate that there little that, as yet, can be said from a Christian point iew which speaks directly to the attitude of the or-technician. It is true that he is often aggressively udiced in his consideration of the contribution of the stian faith to medicine. In particular, to claim, as requently does, that the Church has retarded the nce of medical science is very hard to justify. The ch has said very little in any official way about nce in medical science, except on certain subjects re the extent to which new developments in medical tice, such as the use of abortion and sterilisation, be allowed to be at least problematical. If occa- ally clerics have in the past attacked any new develop- ts, such as the use of anaesthetics, they have not more vocal than conservative groups in the profes- itself at the time. The irritation of hostile doctors be due, however, to the fact that they are either oyed by the superior attitude taken up by Christians hat they are disappointed that Christians have not n them very much help in an enterprise where they eve they may reasonably expect help. Too often, istian comment on medical issues is either so general- as to be vague and unconvincing or else so closely ted to a specific issue that those who do not approach ith Christian preconceptions cannot see why such a is made about it.

ore serious, however, is the complaint that Christian ment has been too often negative. The Christian ics of the doctor-technician fasten on his active ngdoing rather than upon his sins of omission. It is, ourse, easier to criticise in the light of preconceived ndards than to indicate where the profession might more good were its function not so narrowly con- ed. Yet it is precisely here that the most devastating istian criticism of the notion of the doctor-technician be found.

hus, it is surely becoming increasingly clear that the tor-technician, in trying to contract out of the moral onsibilities which medical practice necessarily entails, ying in the face of the plain facts. The experience of scientific technicians in relation to the discovery of mic power is a lesson to all who work in the same l. There is no greater illusion than that which umes that men can safely be content to produce their ults without a thought for their consequences in the of the world where we all, including the technician self, live and seek well-being. Medicine has not yet its atomic bomb, although the doctor has long been iliar with how great a power of life and death rests h him. When the doctor contemplates the develop- nt of his own research along the lines of bacteriological rfare, radioactive gases, and genetic control, can he iously believe that either the profession itself or iety in general will allow him to pursue his way dless of any responsibility for his actions ?

AVOIDING MORAL ISSUES

The doctor-technician, in fact, makes the naïve umption that the development of scientific knowledge always good in itself, and that, if left to take its own y, it will always necessarily lead to good ends. But entific technique, although it is the product of a inite moral attitude and encourages in those who ploy it certain moral attitudes, is itself morally utral and can be employed for good or bad ends. The fact that, in the history of medicine, it has been used for quite conspicuously beneficial ends, is no guarantee that it always will be so used. The Christian understanding of human corruption prompts men to realise that they dare not take the moral foundations of their profession for granted and that the fact that something is now in reputable hands does not mean that it always will be. Almost anything that the human mind has ever envisaged as possible, no matter how devilish, has been attempted.

The doctor-technician fails also to realise how radically he is conditioned by his environment in trying to contract in the way he does out of the realm of moral decision. All he does, in fact, is to make himself "the sport of every wind of false teaching" and the perfect instrument for the meek fulfilment of the wills of strong men who are the enemies of humanity. What precise arguments would the doctor-technician use against an order from Adolf Hitler to exterminate the Jews and to make prisoners-of-war endure torture to make an interesting experiment ? Will the tacit acceptance on the doctor's part of standards of morality and integrity current in society around him be sufficient to give him standing-ground to resist attempts to force him to take action which makes far sharper attacks on his scientific disinterestedness than anything which over-zealous moralists might ever suggest ? Knowledge is power, it is true, but as Karl Jaspers pointed out in a striking rectorial address on the reopening of the medical faculty of Heidelberg University in 1945,[1] it is not necessarily power to those who discover it. As the atomic scientists have found out, powerful knowledge is a dangerous secret to carry around with you when there are desperate characters who also possess political power about, and the one who possesses such a secret needs to know very clearly what his own standards are if he is to prevent its exploitation for ends he would deplore.

TECHNIQUE OF A SPECIAL ORDER

At the same time, the Christian should do full justice to the delicacy of this issue as it confronts the doctor. As has already been sufficiently emphasised, there is a sense in which the doctor is a technician, who can be satisfied simply with providing those who call upon him with efficient technical service and leaving it at that. A due realisation of his place as a technician on the doctor's part may frequently act as a protection to the patient against unwarrantable inroads on his privacy and liberty by the doctor. It would be tiresome indeed if all doctors used visits by busy patients for treatment for sprained ankles as occasions for searching probes into the state of their souls. Likewise, the Christian needs to insist on the importance of technical competence on the strictly scientific level. No amount of personal devotion or theological learning can make up for medical ignorance on the doctor's part.

The doctor is a technician ; but because he deals, not with machines, but with human beings, his technique is of a different order from that of the usual scientific technician. Here the Christian teaching about the uniqueness of each individual comes into play. Any method of handling patients can lose its spontaneity and individual insight and become no more than a technique, and it can happen with busy Christian doctors as easily as with anyone else. But what the Christian sees with exceptional clarity is that the technical considerations which must and should enter into his relation with his patient never finally exhaust that relationship. The patient's physiology, psychological make-up, and social and economic environment all have their part in helping the doctor to understand him, but ultimately it is the individual in his mysterious personal uniqueness with whom the doctor has to deal.

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[1] *Christian News Letter*, No. 247, Nov. 14, 1945.

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esides demanding hospital experience, the college go further and refuse to recognise particular posts ining purposes unless they satisfied certain criteria, d exert strong influence to improve the educational of such posts. On the other hand, criteria of this ould not be applied consistently to hospitals in the ions and Colonies and in foreign countries; and y, 1948, no fewer than 128 entries were from as.

things now stand, though candidates have not spent a year as resident in a major hospital, ave usually had considerable experience. Of the 596 lates last July [1948], only 16 were under twenty- ears of age. Of the 314 ex-Service candidates, t least two years' military service, all but 14 had hospital post before joining up; and of the ing 282 candidates, 212 had done more than two postgraduate work in hospital.

balance, the committee feel that, for the present, ollege should not specify any particular kind of ence as a condition of entry to the examination. is conclusion their lesser reason is that the claims Services make it hard for many to follow a fixed mme; their greater, that restrictions ought to be ed unless patently necessary. Especially would esitate to place any new obstacle in the way of the ble minority who approach consultant status by unconventional path; the physiologist and the al practitioner, for example, should not be denied, gulation, the chance to show their fitness to become al registrars. Also the committee reject the tion that the candidate should be allowed to testimonials to his merits: for this would expose amination to suspicion of prejudice. They believe, ver, that in doubtful cases it would be useful for xaminers to have full information of past employ- . On entry, candidates should be asked to give ls of the appointments they have held, and also to nate a referee who (on request) could say exactly work these appointments have involved.

PRIMARY EXAMINATION

e committee were not persuaded that it would be to precede the membership examination by a ary examination in anatomy and physiology, or her subjects. If this were taken before the student ed the wards, its relevance to the final examination d be small; and if it were taken at a time when the idate is mainly concerned with clinical problems ould probably promote cramming rather than the ed broadening of fundamental knowledge. No ber of the committee wished to set another examina- l hurdle across the course of the consultant's training.

CONDUCT OF THE EXAMINATION

ten Papers

ere are two papers, of three hours each. The first medical anatomy and the principles of medicine; econd is on the practice of medicine, the principles ublic health, and psychological medicine. The mittee think that the papers as nowadays set are fitted to test the knowledge of candidates of registrar s, but they would like to see more questions asked pplied physiology and applied pharmacology. It suggested that candidates should be offered a choice uestions, but the committee deemed this inappro- te in an examination designed to test basic rather specialised knowledge. However, if all questions to be answered, it follows that examiners must be tantly careful to keep them within the general range. n objection to an examination of the basic type is the man with exceptional competence in some icular branch of medicine has little chance to display The committee were attracted by a proposal that, des answering the obligatory questions, the candidate ld have to write an essay, which would show what he could do with a congenial topic. (This introduction of an essay would incidentally be a symbol of the college's belief that doctors should be capable of expressing themselves in cultivated English.) But the practical difficulties of the proposal are very real. If the candidate chose any subject he liked, or if the choice offered were large, it might become usual to prepare an essay in advance. If, on the contrary, the choice were small, the candidate might find no subject to his taste. Foreigners would generally be placed at a disadvantage, which would have to be taken into account; it would be hard to lay down criteria on which the essays should be marked; and the existence of a special essay paper might deter the censors from setting questions that need an answer in essay form, as has lately been their practice. For these diverse reasons, the suggestion was abandoned.

It was agreed that translations from French and German should be retained in the examination, though no additional time should be assigned them. Besides providing evidence of general education, they enable examiners to give credit to candidates who will be able to expand their knowledge of medicine by reading in these languages.

Clinical

By common consent the clinical part of the examination is the most important; and it is here that criticism is strongest. In brief, it is said that too little time is allowed for examining the patients; that success depends too often on being fortunate in one's cases and one's examiner; that the results are correspondingly less predictable than those of other examinations; and that, on the whole, young candidates full of facts do better than the more mature.

Even if held by archangels, an examination rejecting so high a proportion of candidates would certainly be attacked by some of the hundreds disappointed each time, and by some of their teachers. The critics do not always endorse each other's criticisms, and many good judges seem to be satisfied with the present examination as a searching test of competence. All examinations include an element of luck, and on the evidence before them the committee are not convinced that the results of this one have been more than ordinarily unpredictable. Nevertheless, they recognise that it has latterly been conducted under great difficulties, and they feel that the grounds for criticism can and should be diminished.

At present candidates have forty minutes in which to examine a "long case," and are then questioned on it for fifteen minutes by one censor: after which they spend fifteen minutes with another censor who questions them on "short cases." The maximum of marks obtainable is 80 for the long case and 40 for the short ones, and a minimum of 70 marks must be obtained. Obviously, failure in the single long case usually spells failure to obtain the membership, and some of the committee felt that it would be easier to assess the candidate's performance if he examined two long cases of different kinds and if he could make his investigations without the sense of haste imposed by a time-limit of forty minutes. They were impressed, however, not only by the practical difficulties of doubling the number of long cases, but also by the argument that a good examiner needs no more than one case, of any kind, to tell him how the candidate sets about his work. The examination is meant to test method at least as much as knowledge; and, if it puts a premium on readiness of judgment, that is defensible because this quality is useful to consultants. A former censor has declared that "in the routine and method of examining a patient, and in the recognition and evaluation of obvious physical signs, the candidate must be right first time."

The committee cannot escape the conclusion that, whatever arrangements they may suggest, the status and efficacy of the examination will still depend chiefly

What Jacques Maritain has said of the educationist is true also to some extent for the doctor: "What is of most importance to the educator is a respect for the soul as well as the body of the child, the sense of his inmost essence and internal resources, and a sort of sacred and loving attention to his mysterious identity, which is a hidden thing no technique can reach."[2] Doctors who have learnt to look at patients in this way are able to testify how much this aspect of the matter has counted for in their dealings with them.

Because of this, the Christian doctor believes that he is within his rights when he insists that moral issues must be faced. There is a Christian attitude to life and death which it is necessary to have clear and to come to terms with if familiar issues confronting the doctor in relation to the use of contraceptives, abortion, and artificial insemination, venereal-disease control, euthanasia, sterilisation, and prefrontal leucotomy, as well as more remote questions like human experiment and b experiments, are to be responsibly dealt with. Christian has an attitude to health which makes hi it in more complicated terms than that of 100% globin and saturation with vitamin C and which e him to appreciate the value of people who may b from healthy by normal medical standards political, moral, and social context in which the d operates cannot be lightly taken for granted, as were of no account; for it influences the doc decisions and procedure on innumerable points. education of the doctor is not a matter of indiffe Its narrow specialisation and its system of cra may itself have been largely instrumental in m the rise of the doctor-technician inevitable rather any attempt on the part of members of the prof to reason out the matter. These are issues which to be taken seriously by every doctor concerned the efficient discharge of his professional duties, though he will not always agree with our point of in relation to them.

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[2] Education at the Cross Roads. New Haven and London, 1943.

Special Articles

THE MEMBERSHIP EXAMINATION

FUNCTIONS AND CONDUCT

IN comitia last week the Royal College of Physicians of London accepted the following report from a committee[1] appointed last year "to consider whether the examination for the M.R.C.P. as regulated and conducted in the past can meet the needs of the future, and to make recommendations."

The Committee's Report

Since the war the membership examination has been variously criticised by fellows, members, and candidates. In reviewing its functions and conduct the committee have kept in mind especially the following opinions:

1. That neither this examination nor any other suffices to test competence as a physician.
2. That the need to obtain membership overshadows the years after qualification and stops young men from making investigations, or gaining experience abroad, which would profit them more.
3. That success or failure in this examination is governed too much by chance; compared with those of other examinations, its results are less predictable.
4. That it imposes undue strain on candidates, on examiners, and on hospitals.

FUNCTIONS OF THE EXAMINATION

The committee agree that recognition as a trained specialist should not depend wholly on the result of an examination; indeed, more emphasis should rest on training received and on work well done. Ability to pass examinations does not imply corresponding ability to practise medicine, and people who concentrate on the technique of satisfying the examiners are liable to miss their best opportunities of education. At the same time, the decision whether a man is to advance in the profession should not be left entirely to his own teachers, whose estimate of capacity can never be unaffected by personal likes or dislikes. The committee therefore believe that in the selection of future physicians there is still need of an examination, conducted outside the medical schools, at which all comers may prove their worth.

At what stage of training should this be taken?

Many of the criticisms of the present examination, and some of its shortcomings, arise from difference of opinion about its purpose. On the one hand, membership o college is widely regarded as the hallmark of the spec and the examination is looked on as a final test; in case it should presumably be taken at the end of five years' postgraduate training now accepted as minimum preparation for specialist status. On the o hand, teaching hospitals more and more de membership as a qualification for the post of re or chief assistant; and candidates are thus encourage take it early. No examination can fulfil two such diffe functions, and a choice must be made between them

Postponement until five years after qualification w have several serious drawbacks. The prospect of examination so long ahead would hinder develop along lines of personal aptitude or interest, and for t who want to specialise it would mean interference their chosen career. This objection could be partly by letting the candidate take the examination i specialty, such as dermatology or psychiatry; but committee do not favour this big change. They t it better that the examination should generally pre specialisation.

In the committee's opinion, membership of the co should signify a knowledge of general medicine justifies further training as a consultant, and the exam tion should therefore be a test in general medicine. a level higher than that required for qualification. should be taken early in training, normally about t years after qualification, when most candidates will ha completed their term as junior registrar.

CONDITIONS OF ENTRY

The committee see no need to alter By-law C. which states that candidates must be at least 23 y of age; but they recommend that no candidate sh be admitted to the examination until he has been quali for eighteen months.

They carefully considered whether the college sh require the candidate to have held house-appointm for a given period, and whether he should pro evidence of hospital work performed to the satisfac of his chiefs. Clearly, if the examination is taken years after qualification, the successful candidate have to prove himself by his work during several y further training; and there is therefore less reason he should do so before he becomes a member. Aga this is the fact that many of those attaining the mem ship turn at once to specialties, such as psychia and, unless the college insists on their having ho experience of general medicine before the examinat some members may become specialists without ha had it at all.

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[1] The members of the committee were LORD MORAN (president), Dr. GEORGE GRAHAM, Dr. WILLIAM JOHNSON (d. March 15), Dr. DONALD HUNTER, SIR LIONEL Prof. A. W. M. ELLIS, Dr. DONALD HUNTER, Prof. A. J. LEWIS, Prof. W. G. WHITBY, Prof. E. J. WAYNE, Prof. R. V. CHRISTIE, Dr. F. AVERY JONES, Prof. BARNARD, Prof. R. V. CHRISTIE, Dr. T. F. FOX, and Dr. H. E. A. BOLDERO, J. McMICHAEL, Dr. T. F. FOX, and Dr. H. E. A. BOLDERO, (registrar).

eless, the committee would admit that no ordinary e can feel wholly confident so long as he thinks examiners are entitled to condemn him for econdite information. A clear definition of the purpose of the membership examination should be helpful. The committee believe, indeed. art from reducing the frequency of entry—the an do most to relieve the strain on candidates by that they are always examined in general . The presence of a colleague throughout all vs should restrain any tendency for examiners ler too far into their own fields, and should much to suppress hopes or fears founded on the n of chance.

miners

ree that the burden on the examiners must be d, and the committee recommend that the of the clinical examination should be reduced days—or four at most. If, as proposed above. e spent with each candidate is lengthened from o forty minutes, and the examiners examine in e number of examiners needed will be consider- ger. Hitherto the Censors' Board have sought ors only among fellows who have previously s censors; but if the committee's recommenda- pproved, the number of former censors available longer suffice. Under the by-laws of the college, censors bear entire responsibility for the results examination and they should therefore continue uct, alone, the final viva. The committee advise, r, that the censors should in future be assisted by ers appointed by the comitia on the nomination council. These examiners need not have served ors, and should, in fact, be younger than most rs of the Censors' Board.

spitals

al examination on the recent scale have likewise he endurance of the London teaching hospitals. ave had to provide suitable patients and accom- the candidates in the wards. Heavy work falls registrars responsible for the local arrangements. e committee think that the honoraria payable se services to the college might properly be dered.

s been usual, and remains desirable, for the clinical ation to be held in hospitals where one of the ers is on the staff. The appointment of a larger of examiners should mean a larger choice of ls fulfilling this condition.

her possible means of taking the load off the ls would be to transfer the clinical examination examination hall at Queen Square. Having red this solution in some detail, the committee nvinced that it would injure the character of the ation and would create formidable difficulties tice. They hope that it need never be attempted. committee recommend that in the clinical exami- some of the candidates should, if convenient, be ed at regional board hospitals in the London area. e present, at least, they do not think it necessary isable that the examination should be carried to cial centres.

PUBLISHED WORK

committee agree that membership of the college be kept open to candidates of special accomplish- who can suitably be excused the ordinary examina- They do not, however, recommend any change in levant regulation which requires submission of ed work to the Censors' Board.

CONCLUSIONS

committee's main conclusions can be recapitulated ows.

1. Membership of the college should signify a knowledge of general medicine that justifies further training as a consultant. The examination should, therefore be a test in general medicine, on a level higher than that required for qualification.
2. The examination should be taken early in training, normally about two years after qualification.
3. No candidate should be admitted to the examination until he has been qualified for eighteen months.
4. On entry, candidates should be asked to give details of the appointments they have held, and also to nominate a referee who (on request) could say exactly what work these appointments have involved.
5. Throughout the clinical examination, examiners should examine in pairs.
6. The candidate should have forty minutes in which to examine his long case and should be questioned on it for twenty minutes, a short case being used in addition if the long one proves inadequate. Twenty minutes should be allotted to the short cases, which should be two or three in number, and during this time the candidate will be accompanied and questioned by the examiners. The maximum marks for the long case and for the short cases should be 70 and 50 respectively.
7. In the pathological viva candidates should no longer be asked to identify histological specimens, and little importance should be attached to diagnosis from preserved pathological specimens. The two examiners should sit together.
8. The final viva should be used only for reviewing the merits of candidates who have not yet fully satisfied the examiners.
9. Save in exceptional circumstances, candidates should not be allowed to sit the examination more than twice in twelve months.
10. The duration of the clinical examination should be reduced to three days—or at most four.
11. The censors should in future be assisted by examiners appointed by the comitia on the nomination of the council. These examiners need not have served as censors, and should in fact be younger than most members of the Censors' Board.
12. In the clinical examination, some of the candidates should, if convenient, be examined at non-teaching hospitals in the London area.

The committee recognise that their proposals are for functional rather than structural change; but they believe that the total effect of these proposals, and especially of numbers 1, 5, and 9, would be to remedy the defects, or remove the grievances, to which their attention has been drawn. If, after a trial period, further action is seen to be necessary, it should be taken. The committee's final recommendation therefore is that within two years the membership examination should again be reviewed.

INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY

SESSIONS IN OXFORD, CAMBRIDGE, AND EDINBURGH

AFTER the main business of the congress, in London from July 18 to 23, members were offered a choice of visits to three other centres, where meetings were held on Monday and Tuesday, the 25th and 26th.

OXFORD

The large number of members who visited Oxford were warmly welcomed, and here, as in London, the arrangements made for their accommodation and entertainment were distinguished by efficiency and forethought. The reception by the British Council at Magdalen, the tours of the colleges, and the motor-coach trips to the Shakespeare Memorial Theatre at Stratford were well attended.

The academic programme opened with a discussion on *Intracranial Infections* in the Taylorian Institute on Monday morning, with Mr. R. G. Macbeth in the chair.

Sir HUGH CAIRNS emphasised the importance of the subdural space and pointed out what scanty attention on the examiners. Even working under present conditions, the ideal examiner can make full allowance for the fact that one candidate has merely had to collect supporting evidence for a diagnosis apparent from the door, whereas another has been faced with an uncoöperative, deaf, or aphasic patient whose condition required days or weeks of hospital study before it was elucidated. The ideal examiner discounts spot diagnosis, rates the catalogue mind at its true worth, sees no disproportionate significance in ignorance of his own specialty, and is not antagonised by doctrine that he does not accept. But under present conditions, even the ideal examiner must sometimes be fatigued, and something less than ideal; and it ought to be impossible for any candidate to attribute his rejection to the prejudice, antipathy, or impatience of one examiner questioning him alone. The committee therefore recommend that examiners should *examine in pairs throughout the clinical examination.*

The time allowed for questioning should be long enough to obviate any impression of hurry, and the committee recommend that it should be extended by ten minutes. The candidate should have forty minutes in which to examine his long case and should be questioned on it for twenty minutes, a short case being used in addition if the long one proves inadequate. Twenty minutes should be allotted to the short cases, which should be two or three in number, and during this time the candidate will be accompanied and questioned by the examiners. The maximum marks for the long case and for the short cases should be 70 and 50 respectively. The examination should be so organised that the time needed by examiners for discussing the candidate's merits will not be deducted from the time allowed for questioning.

Pathological Viva

An examination in pathology should be conducted by pathologists. The committee wish it to be clear that the membership viva, conducted by physicians, is intended not so much to test the candidate's knowledge of pathology as to ascertain whether he can apply that knowledge to clinical medicine. At present he spends ten minutes in examining histological slides, after which two examiners, sitting separately, question him for ten minutes each: they confront him with pathological specimens, X-ray photographs, electrocardiograms, or laboratory reports, which serve as subjects of discussion. The committee recommend that candidates should no longer be asked to identify histological preparations, and little importance should be attached to diagnosis from preserved pathological specimens. The two examiners should sit together.

Final Viva

The committee debated whether the final viva should be abolished. They favour its retention, but hold that it should be used only for reviewing the merits of candidates who have not yet fully satisfied the examiners.

NUMBER OF CANDIDATES

Last July there were 596 candidates, compared with 161 in July, 1938. In the past year the entries have declined; but they remain—and unless action is taken, are likely to remain—at a level that makes it hard to arrange and conduct a satisfactory clinical examination. Believing that the numbers should be substantially reduced, the committee considered means to this end.

A primary examination, taken a year or two before the final, would eliminate some of the less promising candidates; but the committee had already rejected this proposal on other grounds. Alternatively, it would be possible to use part of the membership examination as a sieve through which the candidate must pass before admission to the clinical. The committee discussed in particular a suggestion that any candidate unsuccessful in the written papers (or in the written papers plus the pathology viva) should be told to proceed no fu which would save everybody time and trouble, the disadvantages of this arrangement seem to ou the advantages. First, it would alter the presen ception of the written and clinical examinati a single whole, in which outstanding clinical accon ment may compensate for weakness in the Secondly, the educational value of the clinical ex tion is far from negligible, and candidates excluded fairly complain of not having a run for their Thirdly, separation of the written papers fro clinical, and their use as a qualifying test, migh them undue prominence in people's minds an encourage candidates to concentrate on book learn

The committee concluded that the over-strain machinery of the examination should be relie possible without altering its essential structure, an *think that the numbers can be made manageal* simply lengthening the intervals at which cand may present themselves. The present custom by many attempt the examination once every three m has been reasonably criticised on the ground th short intervening period of preparation is unlik have made a man an appreciably better doctor; it has accordingly been argued that nobody should on two successive occasions. The committee feel tha a rule might bear hardly on individuals with little t their disposal, and especially on entrants from abroa cannot stay long in this country. They therefore the proposal made by the Standing Committ Members, and recommend that, save in excep circumstances, candidates should not be allowed the examination more than twice in twelve m The probable effect of this change can be gauged the fact that in July, 1947, 156 out of 554 cand were entering for the third or fourth time within t months, while in July, 1948, the figure was 21 of 596.

STRAINS

The Candidates

The committee were told that the examination is of an ordeal than formerly. Candidates approach it an anxiety that sometimes lowers the quality of hospital work. This state of mind infects others, an current attitude towards the membership has be morbid rather than natural. The mental stra enhanced (it was suggested) by continuation o examination over several weeks, during which candidate must three times steel himself against news.

In so far as excessive strain exists, it will be ge deplored. But the examination itself is much what i before the war, when it aroused less dread. Admit the large number of entrants has produced a pr and sometimes perhaps a haste, that allows unsucc candidates to suppose themselves inaccurately sort the machine; but the major causes of emotional te must be sought in the circumstances of the time. coming of the National Health Service, and espe its terms of remuneration in different branches of pra have generally strengthened the motives for securin membership, as a step to consultant status. Ma the older candidates, having spent years in the Ser must gain their objective quickly; only by keeping training grants and securing higher appointments they hope to follow their chosen career and at the time perhaps support a wife and children.

The need to refuse no chance explains why so men, both senior and junior, have been presenting t selves every three months—an enterprise that mus all but the most phlegmatic. It explains why so "have a go" when they know themselves ill-prep and knowledge of incapacity is no doubt a con reason for nervousness in this as in other examina

be a large receptor surface exposed to an air
t which varies in velocity from one part to
r.

Tuesday, in the department of anatomy, a demon-
n of ancient anatomical books, anatomical speci-
and radiographs of interest to the otolaryngologist
ranged by Prof. H. A. **Harris** and Dr. **Michael**
r. An instructive series of slides illustrated the
mount of elastic tissue in the ligaments attached
stapedius muscle.

f. J. S. **Mitchell**, speaking on *Some Developments*
diotherapy, explained that the aim of clinical and
tory research in his department of radiothera-
s is to improve the treatment of cancer and allied
es. The two main lines of approach are: (1) the
ation to radiotherapy of the penetrating high
X radiation generated by the 30 meV synchro-
and (2) the combined use of radiotherapy and
therapeutic agents. Much further experimental
is necessary before the 30 meV synchrotron can
ed in treatment. Clinical trials of large doses
trasodium 2-methyl-1 : 4-naphthohydroquinone
sphate ('Synkavit'), mainly in conjunction with
tive X-ray therapy, have been carried out in 240
its with various types of advanced malignant
ur. The compound is of low toxicity and is
administered by repeated daily intravenous injec-
; it was given by intramuscular injection in 130
and intravenously in 110 cases. Large intravenous
produce almost immediate focal pain in the region
e tumour in some cases, especially where there is
involvement. The compound produces a small
useful improvement in the palliative results of
therapy in some cases of advanced cancer, and
all increase in survival time in cases of inoperable
ioma of the bronchus. Professor Mitchell presented
logical evidence, including ultraviolet photomicro-
nic studies, showing retrogression and degeneration of
ur cells attributable to the effects of the compound
in certain cases of adenocarcinoma, in addition
monstrating the improved palliative effects of the
ination of the compound and X rays.

EDINBURGH

Monday a discussion was held in conjunction with
Scottish Otological and Laryngological Society on
nous Thrombophlebitis and its Complications, in
Department of Surgery, with Dr. G. **Ewart Martin**,
dent of the Scottish society, in the chair.

fortunately, owing to illness, Prof. **Norman** M.
t, who was to have led the discussion, could not
ar, so the opening paper was delivered by Dr. **Berger**
mas. Dr. Thomas dealt with the complications of
mbophlebitis which might be met with in cases
biting a resistant strain of organism. He described
aseptic thrombosis of the lateral sinus, which may
uce a subacute external hydrocephalus (postotitic
ocephalus of Symonds) by back-pressure following
mbosis of the arachnoid granulations. This is seen
ventriculograms which show diffuse subarachnoid
out no shift of the ventricular system. Treatment
loyed consists of intravenous hypertonic saline
tion and control of the cerebrospinal-fluid pressure
a lumbar tapping. Where no improvement occurs
btemporal decompression is advocated with a simple
ate opening in the dura. Aseptic thrombosis of the
bral venous branches of the lateral sinus is often
t in onset, the patient first complaining of loss of
on, or of seizures due to cerebral damage following
mbosis of the veins. Ventriculograms show localised
bral involvement with ventricular shift and displace-
t of the third ventricle. In these cases antibiotics
given as a routine, and the cerebrospinal pressure
ontrolled as before, using a ventricular tapping. A bone-flap decompression may be required. Turning to the septic complications of thrombophlebitis of the lateral sinus, Dr. Thomas referred to Gradenigo's syndrome, which he thought was less commonly seen since the introduction of antibiotics, and which he regarded not as an apical petrositis from direct spread but as a thrombophlebitis of the petrosal sinus. He recommended approach by elevating middle fossa dura. On the other hand, subdural empyema is more common in the present antibiotic era, especially after frontal sinusitis. Leptomeningitis, chronic serous meningitis, or pseudo-tumour cerebri is a basal meningitis where the blockage results in an extensive internal hydrocephalus requiring treatment by an approach between the tonsils of the cerebellum to the fourth ventricle. Dr. Thomas then spoke of cerebral and cerebellar abscess, now considered due to a thrombophlebitic process rather than to a direct spread. He showed that tension within the abscess interferes with the penetration of penicillin, but when the abscess is drained surgically, relieving the tension, penicillin can then be recovered from samples of pus from the abscess cavity.

Dr. A. **Brownlie Smith** contrasted his personal experiences of lateral sinus thrombosis in the pre-antibiotic and antibiotic eras. He felt that while diagnosis was often easy before the introduction of penicillin, many cases presented extreme difficulty, and complications were frequent. Since penicillin has been obtainable, the difficulty of diagnosis has increased, but the serious consequences of thrombosis have diminished. He described a case to illustrate the difficulty of diagnosis in the pre-antibiotic period. A child was apparently making a satisfactory recovery after paracentesis for an acute otitis media when the temperature suddenly rose to 103°F and the child looked ill. Immediate operation was decided on, and on exploration of the sinus, which appeared healthy, free bleeding was obtained. The ends of the sinus were packed off, and a piece of the vessel wall was removed. This showed the presence of a mural clot, and Dr. Smith showed several slides of the thrombus adhering to the wall. Some days later the child's temperature again rose and the jugular vein was tied, after which there was an uninterrupted recovery. Dr. Smith emphasised that the sole indication for interference surgically was the rise of temperature. Referring to his personal series of 29 cases of lateral sinus thrombophlebitis, Dr. Smith said that 22 were pre-antibiotic cases and 14 of these were complications of acute otitis media. There were 7 deaths (32%) in the 22 cases—1 from the anæsthetic, and 6 from undue delay in operating, either because the case was referred too late, or because the condition was not suspected until some days had elapsed in hospital. Of the 7 cases since the introduction of antibiotics, all were associated with chronic otitis media, and 5 were in children under the age of eleven years. No deaths occurred in these 7 cases, and in no case of the antibiotic period has the jugular vein been ligated. Dr. Smith said that either lateral sinus thrombosis is disappearing as a complication of acute otitis media, or, if it arises, it responds to antibiotic treatment and remains undiagnosed. The cardinal features of rigors, positive blood-cultures, and raised C.S.F. pressure with a positive Queckenstedt test are not now seen, and one is dependent on the temperature chart as the only certain guide to the possibility of thrombophlebitis. An unexplained fever in the face of penicillin treatment for acute otitis media is, in Dr. Smith's opinion, an indication for urgent operation. Lastly, Dr. Smith wondered if the anticoagulants might have a place in the treatment of thrombophlebitis thus suspected, though if they were successful the diagnosis could never be established. He had no personal experience of their use.

it had received at the hands of otological writers in the past. It was liable to infection as a result of osteomyelitis of the skull, particularly of the frontal bones after operations on the frontal sinuses. Such pachymeningitis was generally due to invasion by anaerobic streptococci or *Strep. viridans*. Staphylococcal osteomyelitis did occur, as a result of staphylococcal pyæmia, but it was very unusual to find a staphylococcal pachymeningitis. *Strep. viridans* seemed to possess some peculiar property which encouraged it to invade the subdural space. He emphasised the value of systemic penicillin in the treatment of this condition. Before this therapy was available the death-rate in 19 patients was 100%. Since using penicillin he had saved 5 cases out of 13. Massive removal of large areas of the frontal bone was no longer necessary in acute osteomyelitis; small patches of non-viable bone might still have to be excised after penicillin therapy. He demonstrated the X-ray appearance of subdural abscesses after they had been injected with 'Thorotrast,' and detailed their treatment by the insertion of a catheter through a burr-hole in the skull. Penicillin solution was then pumped through the catheter. He stressed the importance of keeping a very close watch for several weeks on the patient's progress after the cessation of antibiotic therapy. Infection might recur in the bone, the subdural abscess might loculate, or a brain abscess might develop. He made a plea for the planned approach to any intracranial infection. A careful clinical study, assisted by X-ray examination, should be supplemented by a determination both of the bacteriology and of the sensitivity of the bacteria to various antibiotics. Then, particularly when the disease was the result of infection by *Ps. pyocyanea* or other gram-negative bacteria, a massive short course of streptomycin should be given. He deprecated premature exhibition of antibiotics until the results of the bacterial study were to hand, since so many of the invading bacteria were prone to become resistant to treatment.

His words recalled a phrase of Wilfred Trotter's: "It is particularly necessary, therefore, for those who possess the admirable temperament of the surgeon, to guard against allowing themselves to mistake mere senseless activity for true surgical determination and promptitude."

Mr. J. B. PENNYBACKER described the modern treatment of brain abscess. He outlined the neurological surgeon's approach to the disease—i.e., the deliberate delay until the abscess had been surrounded by a thick capsule and then the excision of the abscess as though it were a tumour. He deprecated any approach to an abscess in the temporosphenoidal or cerebellar lobes through the infected mastoid cavity, and dwelt on the superior results obtained by tapping the abscess through a separate burr-hole in the skull. The most diagnostically significant signs in a temporosphenoidal abscess were aphasia and a quadrantic homonymous hemianopia in the upper part of the visual field. The cerebellar abscess caused fairly obvious symptoms and signs—loss of tone and of muscular balance on the homolateral side of the body, and nystagmus. He showed that brain abscess was still a grave disease by quoting the case-mortality rates, 44% for cerebellar, 32% for temporosphenoidal, and 20% for frontal abscesses. These figures represented a mass of clinical material, some of which had been under treatment before the introduction of antibiotics, and therefore one could look forward to considerable improvement in the future.

Mr. J. B. CURTIS described the technique of percutaneous angiography, and showed several X-ray plates of the resulting appearances in health and in brain abscess. In his view this method of investigation was safer than ventriculography, but owing to a zone of œdema around the abscess it was impossible to demonstrate sharply the edge of the abscess. He used diodone in performing the arteriogram, and had not s death resulting from this drug. It should not be patients who were prone to asthma or other va allergic complaints.

On the second day Prof. W. E. LE GROS CLARK on *Neurological Studies of the Olfactory Systems*, illu his remarks with some admirable diagrams. One ga that the olfactory cortex, under the close examina the modern anatomist, had been found to be les sive than was formerly thought. He dwelt on the importance of the anterior commissure as a path olfactory stimuli.

Dr. GRAHAM WEDDELL then spoke on some o tions on the *Innervation of the Epiglottis*. He demons that the posterior or laryngeal surface of the ep was covered with numerous large nerve-endings, con with a very rich network of nerve-fibres. He su that these nerve-endings played a part in the respi reflex, and he described a physiological expe which appeared to support this hypothesis.

Mr. M. A. ALLISON, whose paper was read by Pr Le Gros Clark, demonstrated by means of slides changes produced by partial or total ablation of olfactory bulbs.

CAMBRIDGE

The programme in Cambridge was arranged so the delegates, who had had a very hot and busy w London, might find some relaxation in combining work with visits to many of the old and more be buildings of the colleges and university. The w though exhausting, showed Cambridge at its best, the coolness of its cloisters and ancient interiors delightful contrast to the blazing sun outside.

The Vice-Chancellor gave a reception in the Schools on Monday evening, and his guests could at will through its historic rooms. In the morning Dean of Ely had welcomed the associate members to lovely garden and showed them round the Cath and in the afternoon the delegates, after visiting of the colleges, returned to tea in Caius College Tuesday afternoon the Regius Professor of Pl and Lady Whitby held a garden party in Dow College, which made a delightful ending to the Camb visit.

The scientific side opened with a short acco the *History of the University Medical School* by Sir Li WHITBY.

This was followed by a stimulating paper by Prof E ADRIAN on his recent work on the *Analysis of S by the Mammalian Olfactory Organ*. He explained the sense of smell has been investigated by recording discharge of nerve impulses in the fibres of the olf bulb and tract. The olfactory epithelium can stimulated mechanically or by osmotic and disturbances, but the normal stimulus is the move over it of a current of air containing odorous molec The intensity of excitation depends on the concent of the substance and the rate of air flow, but the rel importance of these two factors varies with diff substances, owing probably to differences in the of removal from the receptor endings. Since the current is faster in the more accessible and slower in more remote parts of the olfactory organ, the distri and time relations of the excitation over the whole vary with the nature of the stimulating mat Although there is some indication of differential sensit in the receptors, the discrimination of smells pro rests mainly on differences in the general patte excitation during each inspiration. As with sights sounds, therefore, the discrimination of smells is possible by the elaborate structure of the sense rather than by the variety of the receptors in it. the olfactory organ the essential requirement is that

Letters to the Editor

EXPERIMENTS ON ANIMALS

—What amount of suffering is it legitimate to
in the course of experiments on animals? The
n has *arisen from a study of some papers*
ed in recent years and describing Canadian and
an experiments calculated to inflict the maximum
ry consistent with the temporary survival of the
s, which are then studied physiologically. A
machine has been designed in which unanæsthetised
ith paws bound together, are dropped 40 times
nute. In one experiment 10 rats were subjected
falls in $17^1/_2$ minutes and died on the average
utes *later; another 10 subjected to 800 falls in*
utes died on the average in 47 minutes. The
s were not unconscious. In another experiment
gs, temporarily anæsthetised, had their thigh
s contused by 700 to 1000 blows with a light raw-
allet on each leg. The anæsthetic was then at
iscontinued; 25 of the dogs died after intervals
g from 50 minutes to about 9 hours. References to
apers describing these and other exceptionally
l procedures will be given to responsible inquirers
uest.

should be the last to underrate the importance of
ments on animals: but that importance does not
de all other considerations. There must be a
to the doctrine that the end justifies the means.
912 report of the Royal Commission on Vivisection
whose 7 signatories were eminent medical men,
mended the principle that is now embodied in the
rule attached to British vivisection licences: "If
imal at any time is found to be suffering severe pain
is likely to endure, such animal shall forthwith
ainlessly killed." This rule applies even when
ain object of the experiment has not been attained.

therefore invite scientists to assert with us that
nents of the kind to which we have referred at the
ning of this letter are to be condemned as shocking
normal human conscience. We suggest that in
ing his procedure every experimenter should
stly consider whether the infliction of the pain
ved is really justifiable in the interests of medicine
ience, and try to devise techniques that will reduce
ing to a minimum.

JOHN R. BAKER
F. C. BARTLETT
A. C. HARDY
E. HINDLE
C. W. HUME
W. R. WOOLDRIDGE.

R,—Despite the attacks of antivivisectionists, the
sity for animal experimentation for the relief of
n suffering is more and more generally accepted.
public realises that laboratory experiments per-
ed under licence in this country, after their desira-
, has been justified to the satisfaction of the
inted medical authorities, are invariably conducted
humanity.

is because of the trust that has thus been accorded
e general public that it is incumbent on the medical
ssion to refuse to condone, by silence, unjustifiable
tion of suffering on animals. A series of experi-
s have lately been recorded under the title of
t of Chronic Fear on the Gastric Secretion of HCl
ogs. I do not wish at this juncture to discuss the
tific validity of the experiments or the conclusions
n, but to call attention to the cruelty with which
were conducted.

ven dogs were used—as a preliminary they were operated
render them incapable of barking. The animals were
in metal screen cages, and, in the words of the author, an attempt was made to induce and maintain a state of chronic fear in the animals by strong electric shocks administered to the animals through specially constructed grids making up the floor of the cages. Combined with this form of stimulation, was an electric buzzer which might act either with or independently of the shock. The stimulus was administered by a mechanical device permitting some randomisation of the intervals between the stimuli—74 stimulations being administered within each succeeding twelve-hour period. During the night the grids were often short-circuited by fæces; otherwise, the dogs were stimulated at irregular intervals night and day. The experimental period lasted six months. During this period an occasional break of a few days allowed control measurements of HCl secretion to be performed on the resting animal. Otherwise, the arrangements for arousing in the dogs a state of chronic fear and intermittent pain for a continuous period of six months seem to have been effective.

Science and humanity know no frontiers and no-one who knows the selfless devotion and humanity of our American colleagues would doubt that a more general knowledge of these experiments, at present hidden in a specialised periodical, would arouse widespread indignation. It would surely, in some degree, involve us all in the dishonour that such practices cast on medical research were we to ignore them for fear that attention drawn to them might furnish ammunition for unscrupulous arguments of antivivisectionists.

Newlands, Frenchay, near Bristol. F. GOLLA.

THE MENSTRUAL CYCLE

SIR,—The facts forming the basis for my belief that the suprarenal cortex plays an important part in the determination of sex are briefly as follows.

Whilst the constellation of chromosomes at fertilisation determines the genotypic sex of the zygote, an intermediate sex-determining mechanism has been evolved in vertebrates which gives anatomical and physiological expression to this genotype. That this intermediate mechanism is responsible not merely for sex differentiation but also for sex determination in any but the narrowest genetic sense is clear from the fact that the undifferentiated gonad is ambivalent—i.e., capable of developing into either testis or ovary. The elucidation by Lillie of the "freemartin" phenomenon and the experimental investigations of Danchakova, Wolff, and many others have demonstrated that the sex-steroids can influence gonadal development, even to the point of complete reversal of the genetic sex. It can, therefore, be assumed that these substances, in so far as they occur in the early embryo, will play an important part as intermediate inductors in the normal mechanism of sex determination. In human beings the only sources of sex-steroids before the differentiation of the gonads are the maternal plasma, the placenta, and the suprarenal gland of the embryo, which begins to differentiate at the 6 mm. stage, and shows a well-defined fœtal type of cortex at the 10 mm. stage—i.e., considerably in advance of the differentiation of the gonads. Abundant evidence suggests that the fœtal adrenal cortex is identical with the androgenic X-zone of the permanent cortex. These facts taken together with the close anatomical relation of the suprarenal gland to the developing gonad and the well-known association of adrenal abnormalities with intersexuality make it highly probable that the adrenal gland plays an important part in the normal mechanism of sex determination, and Professor Zuckerman's comment (July 23) that such a belief lacks scientific foundation is certainly not justified. Whilst the details of the mechanism are not yet understood, it may be assumed that part of the adrenal function is to counteract the effects of maternal and placental œstrogens.

In stressing the importance of suprarenal cortical hormones in determining the events of the normal menstrual cycle, I do not wish to supplant the hard-

In England Now

A Running Commentary by Peripatetic Correspondents

So the Jutes have invaded Kent again, and have penetrated as far as Richmond, the only serious opposition having been offered by St. Thomas's Hospital. But we had already invaded Copenhagen this summer, clean-shaven, it is true, and by steamer as befits modern dermatologists. The steamer was the *Kronprinz Frederik*, and austerity ceased from the moment we stepped on her comfortable decks. From Esbjerg to Copenhagen one crosses three islands linked by bridge and train ferry. Danish farming unrolled itself before our eyes, and having heard so much of its advanced perfection we were pleased and surprised to see so much of it done by horses. But Denmark is short of petrol and diesel oil.

Copenhagen is a charming, leisurely city; no hurry, no bustle, and in consequence, as one of the party observed, no rosacea. Architecturally it suggests that the Age of Reason so far forgot itself as to have an affair with the Russian Ballet. Sober dignified 18th century façades have their silvery elegance mocked by a bulbous dome or a twisted sugar-candy spire in gleaming gilt. Hans Andersen's little mermaid in bronze watches it all from her sea-wet rock. Unlike the Spartans', her tidy wet hair needs no combing.

Our first visit was to the famous Finsen Institute and its hospitable director, Prof. Svend Lomholt. We saw with envious eyes the superb light-therapy installations in action, and were then given an admirable display of cases, which included some Continental rarities not often seen in this country, such as acrodermatitis chronica atrophicans. Professor Lomholt was enthusiastic over his results with calciferol in lupus. The patients themselves were an interesting study, and the doctor-patient relationship seems to be as near perfect in Denmark as human nature can make it.

Another day was spent in the Rijkshospital with the genial Professor Haxthausen. An excellent clinical meeting was followed by a demonstration of simple practical therapeutic methods. Success in treating skin diseases is 50% a matter of detail, and the doctor who can stop a patient scratching will do far better than an expert on the latest antibiotics. Professor Haxthausen combines inspired common sense with scientific scholarship. One leaves his clinic filled with a happy zest at belonging to such a good profession, and a growing enthusiasm for the Anglo-Danish entente.

Life in Copenhagen is not all work. The Tivoli Gardens, in the middle of the city, have their restaurants and fun fair, with music and everyone managing to be happy without being raucous. A glass of Schnapps costs 2s. and adds to gaiety. If anyone is likely to ask you " Qu'as tu fait, toi, de ta jeunesse ? " I should advise spending a bit of it in Copenhagen. We lacked only one thing —a word. " Hospitality " in our country suggests Spam and a reconstituted egg. It has come down in the world since the Roast Beef of Old England days; and is now a poor little undersized creature. It is absurd to apply the same word to the feasts we were given in Denmark. Hospitality there is a noble animal, by Lucullus out of Gargantua. After three days of it we stepped on to our home-bound train like happy boa constrictors.

* * *

When my thrice-weekly morning help, a farmer's daughter, told me not long ago that she felt tired and slack because she had been eating a lot of lettuce and that it always had this effect on her, I murmured that lettuce was supposed to induce sleep. Her brother, she continued indignantly, had said it was imagination, though he himself had reported that the waitresses in the café he frequents on market days complained of heaviness and fatigue during the season of salad meals. I thrust away my vague feeling about the properties of lettuce, and suggested that lack of sufficient other nourishment with the salad might explain her feelings; but this was denied. In fact, eggs, milk, cheese, and occasional rabbits are quite plentiful in her home; so lettuce, which itself is hardly food, is generally well supported. The plump girls in the café, too, are no doubt fed liberally, for the establishment caters f hearty country inhabitants of our district and is u to muzzle the oxen—in other words, the wai I go in sometimes to buy the substantial fresh c sandwiches sold over the counter, and note that the served look more appetising and abundant than I have had at pretentious hotels.

Speculating on the nursery lore at the back mind which had made me say that lettuce m sleep, I wondered what my books had to say *Lactuca*. The *B.P.C.* has an extractum prepared from the expressed juice of *Lactuca* with a dose of gr. 5–15. " Lettuce," it says, " is sedative and hypnotic, and is used in irritable It also describes " lactucarium," or " lettuce hard lumps of the dried juice which are green whe and turn brown on keeping. The sedative su seems to be the colourless, tasteless, crystalline lac I turned to the botanists and found that Hooker[1] " The thickened juice of the cultivated lettuce, thridace, is used as a narcotic, and preferred to in cases where there is reason to fear the stu action of the latter." In Folkard's enchanting I read : " The old poets prescribed a bed of Let those who were unable to obtain repose; and states that Lettuces of all description were tho cause sleep. Pope, referring to its soporific q has said of the Lettuce :

> ' If your wish be rest,
> Lettuce and cowslip wine, probatum est.' "

Doubtless our grandmothers and theirs in turn recommended lettuce for sleep since the time of although the news has not yet reached the judging from the mutterings of a girl of that she brought me a plate of it, saying in her own la " Fancy eating grass." Therefore let all who colons to digest it and no allergy (a friend of " covered with hives " if she but taste it) eat lett supper and need not poppy nor mandragora.

* * *

The so-called dead languages are so very much in us that when we come across people from whom are totally absent the scales fall from our eyes crash. I do hope the nursing experience now m won't cut into the classics. I have recently had through masses of death-registrations, copied in " lish " from medical handwriting by an intelligent European clerk. One in particular comes out as A *sectorasis* or even as *Atrix sedoroni*, both of which good enough to start out as entities on their own. the palm goes (and what psychopathological vis not opened up ?) to the case of the elderly Indian departed this world on account of " Atheris secto cardic and penal failure."

* * *

The R.M.O. taking a class of students round the pointed with some pride to a girl who had been fully treated for pneumococcal meningitis. " But does she squint ? " objected a critical student. " E her and find the cause," replied the R.M.O. A few mo later the student, having examined the girl, repo " There is paralysis of the external rectus muscle the pupil is fixed." " What is the cause ? " asked R.M.O. " Nerve damage resulting from menin was the answer. The R.M.O. turned to the patient " the doctor your eye, Nelly," he said. The girl swift face-wiping movement and before the asto students had time to think, they saw in her outst palm—a glass eye.

* * *

Holidaying in the heart of Wilts I was not s my way in a small village and, not wishing to " I'm a stranger here myself," applied for directi a typical son of the soil wending his weary way a hoe over his shoulder. I was met with a sh the head and " No spik." " Parlez-vous franç I asked. " No spik." " Sprechen sie deutsch ? " spik." " Parlate italiano ? " " No spik." " Well, *do* you speak ? " " Ungarisch." I gave it up.

1. Hooker, W. J. A System of Botany. London, 1870.
2. Folkard, R. Plant Lore, Legends and Lyrics. London,

OSTRACISM OF THE TUBERCULOUS

—Many of us working in the field of tuberculosis he concern of Dr. Edelston (July 16) lest ostracism tuberculous should cause patients to conceal their and thus disseminate it. But one of his remarks, qualified, is in my view misleading and contrary eral experience. He writes "it is time that it was l that active cases of pulmonary tuberculosis can sed in general wards of general hospitals without aallest danger to nursing staff or to the non-ulous patients." Had he added "if adequate tions are taken" one might be inclined to agree. er, where cases of active pulmonary tuberculosis mitted sporadically to general wards it is unlikely mior nurses or even ward sisters are aware of what tions should be taken; nor are facilities for the ate disinfection and disposal of sputum and soiled usually available. Again, one wonders how often ulous patients in general wards are supplied with lual crockery, whether they are taught safe ing, and whether nurses tending them are urged r masks. My own feeling is that there is probably isk to staff in a well-run sanatorium than in eral hospital where positive-sputum cases are ntly admitted to the general wards.

r issue of July 16 also contained reports of papers by various distinguished authorities on tuberculosis rses and students. Dr. Marc Daniels, in his able ing-up, stated that it is now generally agreed that is a higher tuberculosis morbidity among hospital rs than in the general population, and drew atten-o the casual attitude towards tuberculous infection ny hospitals.

purpose in writing is not to exaggerate such risks ist, which in my view are almost negligible in ux-positive subjects where adequate precautions aken. I feel, however, that the proposal in Dr. ton's letter which I have criticised might, if acted lead to a perpetuation of the casual methods red by the above-mentioned authorities, which only tend to maintain a higher incidence of tuber-s disease in hospital workers.

dale Hospital, London, N.W.9. W. E. SNELL.

QUININE IN ACUTE MALARIA

,—The prevailing tendency amongst writers on the ment of malaria is to stress the virtues of the r plasmocidal drugs while showing remarkable erence to the established properties of quinine. attitude is also prevalent amongst newcomers to cal practice in the tropics—so much so that one is ed to conclude that the present-day teaching in cal medicine fails to stress the salient fact that ine is still our sheet anchor in the treatment of acute ria.

ose of us who through years of practice in the cs have learned to respect the unpredictable vagaries viciousness of malignant malaria in the non-ne, continue to regard quinine as the most reliable most effective of all the plasmocidal drugs in gaining ly control of an acute attack; and this still holds after giving fair trial to all the newer plasmocidal s. Furthermore, the prejudice expressed in some oritative quarters against the use of parenteral ine therapy—more especially against intramuscular tion—is wholly unjustified. With the patient rated by the persistent and intractable vomiting the profound toxæmia that so often accompany ks of acute malignant malaria, oral therapy is ly unreasonable; in such circumstances the nteral administration of quinine will not only save but will spare the patient hours—even days—of ess and suffering.

I consider that the basic procedure in the treatment of acute malaria in Africa consists in: (1) overwhelming the infection and so gaining rapid control of the attack with quinine either orally or, in special circumstances, parenterally (quinine acts promptly on the parasite in the early stages of schizogony): and (2) following through with a full course of one of the newer plasmocidal drugs. Dosage varies with the strain or species of the causal plasmodium.

Salisbury,
Southern Rhodesia. WILLIAM KERR BLACKIE.

SHOE LACES FOR THE STIFF-JOINTED

SIR,—Mr. Dundas Irvine's patients (July 30, p. 199) can give up their search for an instrument "to draw tight and tie shoe laces" if they use elastic shoe laces. These are supplied by the Soesi Co., 78, Upper Richmond Road, London, S.W.15, in various colours and sizes.

Birmingham. G. K. ROSE.

Parliament

QUESTION TIME

Grading of Venereologists

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health if, in view of the fact that by reason of the downgrading of venereologists the total of accredited specialists would be reduced to a number wholly insufficient to deal with the increasingly anxious problem of venereal disease, he would review the position.—Mr. ANEURIN BEVAN replied: Boards are at present reviewing their medical establishments in the light of the needs of the service. It would not be proper for the grading of existing individuals to be influenced by considerations of staffing requirements.

Ambulance Services

Mr. BAKER WHITE asked the Minister what was the total strength of the ambulance services coming within the scope of the National Health Service in terms of personnel and vehicles; and what were the corresponding figures for public ambulance services on June 30, 1946.—Mr. BEVAN replied: The figures for the National Health Service (England and Wales) are whole-time drivers and attendants 7000 (approx.): ambulances 3321; sitting-case cars 824. The corresponding figures for public ambulance services before July, 1948, were obtained somewhat later than the date mentioned in the question. They are 4275; 3925 (including a large number of works and colliery ambulances still operating outside the National Health Service); and 366.

Hearing-aids

Mr. GERALD WILLIAMS asked the Minister what percentage of 'Medresco' hearing-aids have been found to be faulty.—Mr. ARTHUR BLENKINSOP replied: About 3% of the aids delivered to distribution centres are now returned as faulty. Of the aids issued to patients in the first year about 24% have come in for servicing or repair in England and Wales, but it is difficult to know how much of this represents original faults in the instruments. Mr. WILLIAMS: Has the Minister any idea how long it takes to repair these hearing-aids, because there is a great deal of complaint about this matter?—Mr. BLENKINSOP: Very often the repairs are minor servicing repairs. We regard the proportion of sets which come back for minor repairs and servicing as extremely small.

Spectacles, Dentures, and Wigs

Mr. WILLIAM TEELING asked the Minister how many pairs of glasses and how many sets of false teeth and how many wigs have been provided in the last 12 months; and how many demands are still outstanding.—Mr. BLENKINSOP replied: At a very rough estimate, about $4^1/_2$ million pairs of spectacles have been supplied under the supplementary eye service and between three and four million pairs are on order. No information is available as to the number of dentures. Up to May 20, 8000 wigs were ordered and 2600 supplied through the Ministry of Pensions, on the advice of specialists.

Birth-control Advice in the Colonies

Mr. R. W. SORENSEN asked the Secretary of State for the Colonies in which Colonies was appropriate birth-control gained and solid knowledge concerning the action of pituitary gonadotrophin and of the ovarian hormones. These account for the maturation of the follicle and corpus luteum, for the development of the endometrium, and for certain side-effects on secondary sexual characteristics. This leaves, however, a residuum of phenomena, especially in relation to the mechanism and timing of ovulation and menstruation and in connexion with collateral cyclic changes affecting the female organism as distinct from those which are confined to the sexual apparatus. These events which cannot satisfactorily be explained on a pituitary-ovarian basis are as constant and integral a part of the menstrual cycle as follicular and endometrial maturation. It is my contention that the scientific data available (including some which were provided by the work of Professor Zuckerman) allow the conclusion that these constant and important events of the normal menstrual cycle are largely determined by suprarenal activity.

Usher Institute,
Edinburgh University.
ERICH GEIRINGER.

TESTICULAR PAIN

SIR,—In his letter of July 2 Dr. Weale claims to defend "some fundamental tenets of orthodox surgery and physiology" but at the same time makes some unorthodox statements on anatomy. He asserts that the nerve-supply of the testis, its coverings, and the scrotum are all L 1–2. This is certainly not the view of the authors of our most orthodox textbooks of anatomy, who give the innervation of the testis as from the tenth thoracic segment of the spinal cord through the renal and aortic plexuses, of the superior part of the scrotum from the first lumbar segment via the ilio-inguinal nerve, and of the inferior and perineal parts from the (second) third and fourth sacral segments via the scrotal nerves and perineal branch of the posterior cutaneous nerve of the thigh. The genital branch of the genitofemoral nerve supplies the cremaster and a few filaments to the skin of the scrotum. The nerve-supply of the tunica vaginalis testis is not so clearly stated, but as it is developmentally a portion of the parietal peritoneum one may reasonably assume that its innervation is from the overlying somatic nerves.

The integrity of the genitofemoral nerve after operation in the case described could hardly be investigated by attempting to elicit the cremasteric reflex as suggested by Dr. Weale. It was clearly stated by Mr. Brown in his article that the coverings of the cord had been removed; therefore the cremaster muscle was no longer present after operation and no reflex could possibly have been elicited even in the unlikely event that the nerve itself had been preserved. The view that the loss of testicular sensation was due to damage to the ilio-inguinal nerve can also be ruled out since Mr. Brown informs me that he always identifies and preserves this nerve when operating on the inguinal canal, and furthermore that in this particular case there was no post-operative anæsthesia in the cutaneous distribution of the ilio-inguinal nerve.

The segmental innervation of the ureter is from the tenth to twelfth thoracic and first lumbar segments of the spinal cord, and this explains the descending nature of true visceral pain in calculus obstruction of the ureter as successive segments are involved. That irritation of the genitofemoral nerve can occur in this condition is known, since the cremaster is sometimes found to be contracted on the affected side with consequent retraction of the testis. If the motor fibres in the nerve can be thus involved it does not seem unreasonable to suppose that pain in the scrotum or even in the thigh is due to similar irritation of the sensory fibres in the nerve. At any rate the anatomical pathways are present for all three types of ureteral pain described.

Finally, one can perhaps understand the occu testicular pain in the cases of ruptured hydron and ruptured abdominal aortic aneurysm, but th ment that any retroperitoneal lesion can give testicular pain seems too sweeping. Carcinoma head of the pancreas, although retroperitoneal, d seem to be a likely or even possible cause of t pain. My views, however, are based mainly on ana grounds and I leave it to others with more experience to make their comments.

Department of Anatomy,
University College, Dundee.
J. D. B. MACDOU

ATROPINE AND CURARE

SIR,—It is well known to pharmacologists that a and curare have similar actions, but the amo atropine required to produce neuromuscular blo large that it is not of much importance clinicall Sinha and I, working on the rat diaphragm found recently, however, that doses of atropine have a very small effect on the isolated diaphrag sensitise a preparation to curare, so that a dose previously was ineffective may increase the ac curare almost twofold. Doses of atropine and which separately are ineffective may together complete neuromuscular block.

As atropine and curare are commonly used cli this appears to be of some practical importance.

Department of Physiology,
King's College, London, W.C.2.
R. J. S. MCDOW

EPIDEMIOLOGY OF POLIOMYELITIS

SIR,—On reading the letter from Dr. D. P. L (July 23), in which he mentions the verminous co of hedgehogs, I am reminded of an incident som ago. I found a fully grown hedgehog crossing road, captured it, and put it in a greenhouse w idea that it would help to keep down pests. lively when captured, but next day it was very le and I noticed that it had paralysis of the hindqu later in the day the paralysis had ascended to th quarters, and on the following day, when attemp feed it with milk from a pipette, it was obvio paralysis of the pharyngeal muscles had occurre animal was infested with ticks.

Shortly after this I happened to read an acc the *Journal of the American Medical Associatio* type of ascending paralysis occurring in some the United States which appeared to be due to a of tick fastening itself to the nape of the neck. removal of the tick allows the patient to recover. out suggesting that this can bear any relation to poliomyelitis it might suggest something to interested in the tick as a source of infection in the obscure diseases.

I am told by a friend interested in natural that if a hedgehog is found in the open in daylig almost always found to be sick, and will soon di own experience with captured hedgehogs confirm

Plymouth.
EDRIC WI

SIR,—On July 14 at about 6.30 P.M. a ho appeared on my lawn. It moved with difficul occasionally appeared to collapse on the nea leg as if there was some partial paralysis. Ot it seemed well and drank some milk. After a some half-hour it went into an adjacent cop reappeared on two subsequent evenings at th time (an unusual time for hedgehogs to be abou I was hoping to tame it; but after its third disappeared. I should say it was not fully Could it possibly have been suffering from poliom

Graffham, near Petworth, Sussex.
A. H. S

P.S.—I could supply to anyone interested som spoor.

l Insurance (Medical Certification)-Amendment Regu- 1949—may be had from H.M. Stationery Office through booksellers.

ANCE BENEFITS DURING STAY IN HOSPITAL

R the provisional regulations operating since July 5, patient maintained free of charge in hospital has had ional Insurance sickness benefit reduced by 10*s.* a ut not below 5*s.*) after two months. If he has a nt who satisfies certain conditions, there has been her reduction; otherwise, benefit has been payable week after he has been in hospital for fourteen months. g on a report from the National Insurance Advisory tee, the Minister of National Insurance has made new ons to come into force on Sept. 5. In future, after two in hospital, the benefit of a patient with a dependant reduced by only 5*s.* a week, and there will be no further n if the beneficiary has arranged for all but 5*s.* of his to be paid to the dependant. Where a patient has no ants, his benefit will be reduced by 10*s.* a week after nths in hospital. After a year it will be reduced to t on discharge a resettlement sum will be available. he second year it will be finally reduced to 5*s.*

nts suffering from any form of respiratory tuberculosis able to receive 10*s.* (instead of 5*s.*) while they are pital, but the amount which is paid over to their ants, or which can be paid on discharge, will be ondingly reduced.

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rsity of Oxford

uly 16 the following degrees were *conferred*:

—J. P. Childs.

—D. A. T. Tizard, R. T. T. Warwick, W. J. C. Symonds, Barr Brown, Richard Kelly-Wischam, Sheila J. Thorogood, I. M. Oriel, G. A. Rose,* D. G. R. Campbell,* G. de B. -Barberton,* J. W. Yeandle-Hignell,* Susan E. Scott-*

* In absentia.

rsity of Birmingham

July 2 the honorary degree of D.SC. was conferred on ward Florey, F.R.S., and Dr. F. Peyton Rous. The ng degrees were also conferred:

—E. B. C. Hughes (ex officio).

—J. J. Elkes, Margaret D. Thompson* (with honours); Carruthers.

, *B.S.*—F. B. Buckley, Sheila G. S. Burnie, V. W. N. Drury, et T. Jones, Ann L. Reynolds M. onours); June M. Astill, err ll, R. M. Butler, Winifred mberlin, E. W. Clarke, J. A. G. Clarke, R. F. Crampton, Creedy-Smith, J. R. Cross, D. H. Davies, W. R. Davies, Dingley, Margaret G. Douglas, F. J. Ensell, Thelma P. son, P. D. Hooper, Ivan Hyde, Marjorie E. Johnston, J. E. Jean M. Kennedy, N. G. Kirby, O. D. F. J. Malins, M. R. Mellor, B. rds, Robinson, R. G. Robinson, D. S. ens, Stevens, Kenneth Wade, L. E. M. er, Jean I. Whittle, Victor Zuck, M. ngton.*

* In absentia.

A. B. L. Beznak, formerly professor of physiology and of the faculty of medicine in the University of Budapest, een appointed lecturer in physiology; Dr. C. N. Iland, ch lecturer in bacteriology.

l College of Obstetricians and Gynæcologists

a meeting of the council held on July 23 Prof. Hilda was elected president in succession to Sir William tt. She will assume office in October. Mr. J. E. Stacey Ir. V. B. Green-Armytage were elected vice-presidents. ollowing officers were re-elected: treasurer, Mr. A. A. ell; hon. secretary, Mr. H. G. E. Arthure; librarian, W. Roques; curator of the museum, Mr. Aleck Bourne.

following were elected to the membership:

. Backus, Jessie E. C. Baird, T. E. C. Barns, Anusya Bhagat, Blakey, V. Y. Bockner, Sudhir Chandra Bose, M. B. Bruce, Cummin, Mona M. Davin-Power, R. G. Denniss, Henry man, Thomas Dougray, L. W. D. Drabble, C. T. F. Ealand, Emsley, G. M. Evans, J. J. Foley, P. S. Gardner, G. W. d, H. K. B. Geiser, Elizabeth Gilbertson, Marie P. S. Grant, Hammond, J. C. Harvey, John Henderson, J. A. Henderson, Hendry, R. W. Hutchinson, E. W. Ilangantileke, E. P. , F. G. E. King, J. M. King, E. W. Kirk, Joan E. M. Lambert, as Latto, J. G. Lawson, F. H. Leckie, E. M. Leyland, J. W. F. den, J. M. McCracken, Ian MacGillivray, H. N. Mansfield, Millar, Rustam Moolan-Feroze, L. O. Morgan, M. R. Neeley, R. Picton, J. G. Reynolds, N. A. Richards, Szulin Riterband, Roddie, J. H. Routledge, Choudhuri Abdus Samad, E. M. er, Olive C. Sandys, J. W. F. Scrimgeour, Sita Sen, J. G. n, Norah P. Sherlock, Appacuty Sinnatamby, J. A. McC. , Doreen M. J. Stracey, A. B. Swarbreck, J. L. Taylor, bhoo Datta Tewary, John Watson, G. F. J. Williams.

Royal College of Physicians of London

At a comitia of the college on July 28, with Lord Moran, the president, in the chair, the following fellows of the college were elected officers for the ensuing year:

Censors: Prof. J. Crighton Bramwell, Dr. J. Forest Smith, Prof. R. V. Christie, Dr. A. H. Douthwaite. *Treasurer:* Prof. W. G. Barnard. *Registrar:* Dr. H. E. A. Boldero. *Assistant registrar:* Dr. W. D. W. Brooks. *Library committee:* Dr. J. Bishop Harman, Dr. M. L. Rosenheim, Dr. R. R. Bomford, Lord Amulree. *Finance committee:* Dr. G. B. Mitchell-Heggs, Dr. C. T. Potter, Dr. F. Avery Jones.

The following were elected examiners:

Chemistry: Mr. Alexander Lawson, PH.D., Mr. A. E. Kellie, PH.D. *Physics:* Mr. Stanley Rowlands, PH.D., Mr. J. E. Roberts, PH.D. *Materia medica and pharmacology:* Prof. E. J. Wayne, Dr. E. F. Scowen, Dr. Bishop Harman, Dr. R. R. Bomford, Prof. A. C. Frazer, Dr. V. J. Woolley. *Physiology:* Prof. W. R. Spurrell, Prof. J. L. D'Silva. *Anatomy:* Prof. James Whillis. *Pathology:* Prof. R. J. Pulvertaft, Prof. W. D. Newcomb, Dr. Kenneth Robson, Dr. Arthur Willcox. *Medical anatomy and principles and practice of medicine:* Dr. K. Shirley Smith, Dr. C. B. Levick, Dr. E. R. Cullinan, Dr. T. C. Hunt, Dr. Robert Coope, Dr. H. L. Marriott, Sir Horace Evans, Dr. A. V. Neale, Dr. J. C. Hawksley, Dr. F. P. Lee Lander, Dr. William Brockbank, Dr. S. P. Meadows. *Midwifery and diseases peculiar to women:* Mr. D. H. Macleod, Mr. R. A. Brews, Mr. Arnold Walker, Mr. K. V. Bailey, Mr. Ian Jackson.

Public health: Part I, Prof. J. M. Mackintosh; *Part II,* Dr. J. Greenwood Wilson. *Tropical medicine: Section A,* Major-General Sir Alexander Biggam; *Section B,* Prof. George Macdonald, *Ophthalmic medicine and surgery:* Dr Dr. E. A. Blake Pritchard, Dr. Denis *medicine: Part I,* Dr. W. D. Nicol; *Part* Dr. Noel G. Harris. *Laryngology and ot* *Medical radiology:* Prof. Gilbert Stead, D.SC., Dr. Peter Kerley, Prof. D. Waldron Smithers. *Anæsthetics:* Dr. Robson, Dr. C. A. Keele, Dr. A. D. Marston, Dr. B. R. M. Johnson. *Child health:* Dr. Kenneth Tallerman, Prof. J. M. Smellie. *Physical medicine: Part I,* Dr. Jack Watson Litchfield, Prof. Sidney Russ, D.SC.; *Part II,* Dr. W. S. C. Copeman, Dr. D. C. Shields. *Industrial health: Part I,* Dr. J. A. Charles; *Part II,* Prof. R. E. Lane. *Murchison scholarship:* Dr. M. L. Rosenheim, Dr. J. F. Dow.

The following lecturers were appointed:

Sir Leonard Parsons, F.R.S. (Harveian Orator), Dr. E. R. Cullinan Parsons-Smith (Lu Dr. E. E. Pochin Prof. J. H. Dil Rolleston), Prof. E. C. Dodds, F.R.S. (Bertram Louis Abrahams), Lady Violet Bonham Carter (Lloyd Roberts)—all for 1950; and Dr. T. F. Fox (Croonian) for 1951.

The Baly medal was awarded to Sir Edward Mellanby for his services to physiology and his work on nutrition with particular reference to the accessory food factors.

The following having satisfied the censors' board were elected to the membership:

D. E. Aikenhead, M.D. Manitoba, C. D. Alergant, M.D. Lpool, Sivasithamparam Balasingam, M.D. Lond., Joseph Baragan, M.B. Cairo, E. M. M. Besterman, M.B. Camb., J. E. Blundell, M.B. Camb., R. E. Bowers, M.D. Lond., J. F. Britto, M.B. Bombay, D. E. St. J. Burrowes, M.B. Lond., L. J. Bussell, D.M. Oxfd, J. A. Chamberlin, M.B. Lond., Patricia Chippindale, M.B. Lond., E. S. Clarke, M.D. Chicago, M.B. Durh., H. R. Colquitt, M.B. Lond., Lorna Cooke, M.B. Lond., Christine E. Cooper, M.B. Camb., J. E. Cotes, B.M. Oxfd, C. J. Don, M.B. Lond., A. S. Douglas, M.B. Glasg., C. E. P. Downes, L.R.C.P., J. R. Edge, M.D. Leeds, R. H. Ellis, M.B. Camb., J. D. Everall, L.R.C.P., P. R. Fleming, M.B. Lond., R. V. Gibson, M.B. Camb., J. E. MacA. Glancy, M.D. N.U.I., J. M. Gooch, M.B. Melb., D. A. Gordon, M.B. N.Z., R. G. Gornall, M.D. Lpool, R. F. Griffith-Evans, M.B. Lond., L. N. Grunbaum, M.B. Camb., Stefan Grybowski, M.D. Polish Sch. Edin., R. O. F. Hardwick, M.B. Lond., D. S. Harling, M.B. Edin., W. C. Harris, M.B. Lond., Walter Hausmann, M.D. Vienna, J. C. Hogarth, M.D. Glasg., Marshall Herwitz, M.D. Cape Town, Betty E. Howarth, M.B. Lond., June L. C. Hutchinson, M.B. Manc., L.R.C.P., M. A. Ja A. James, M.B. Edin., Oscar Janus, M.B. Man M.B. Cape Town, A. M. Joekes, B.M. Oxfd, E. R. Jones, M.B. Wales, A. J. Karlish, M.D. Rome, L.R.C.P., R. C. King, M.B. Lond., Anthony Knudson, M.B. Lond., J. B. Lyon, M.B. Camb., R. F. Mahler, M.B. Edin., R. H. Meara, M.B. Camb., Khas Bin Megat Omar Megat, L.M.S. Singapore, Margaret Middleton, M.B. Lond., E. W. Nation, M.B. Camb., K. A. Newton, M.B. Lond., J. A. Nightingale, M.B. Manc., Gerald O'Gorman, L.R.C.P., Chunighai Vallabhabhai Patel, M.B. Bombay, H. K. Pawsey, M.B. Melb., A. V. Price, M.B. Lond., S. G. Rainsford, M.D. Dubl., Surgeon Captain R.N., J. T. Rendle-Short, R. F. Robertson, M.B. Edin., K. C. Robinson, M.B. Camb., L.R.C.P., Raghunath Sahu, M.B. Patna, F. D. Schofield, M.B. Camb., A. B. Sclare, M.B. Glasg., G. A. Scott, M.B. Belf., W. A. McD. Scott, M.B. Aberd., major R.A.M.C., F. W. Smith, M.B. Manc., I. O. Stahle, M.D. Melb., A. H. T. Swan, Tinker, M.B. L M.B. Lond., A. S. Turner, M.B. N.Z., D. A. Nakka Rangian Venkatswami, M.B. Osmania, G. R. Venning, B.M. Oxfd, R. G. Vine, M.D. Belf., D. G. Vulliamy, M.B. Camb., M. H. West, M.D. Lond., Donald Whitfield, M.B. Camb., D. H. M. Woollam, Esme M. Wren, M.B. Lpool, E. A. Wright, M.B. Lond., R. J. Young, M.B. Belf., flight-lieutenant R.A.F.

Licences to practise and diplomas were conferred on those named in the reports of the Royal College of Surgeons below and in our issues of May 21, June 18, and July 23.

information and assistance made available to those desiring it; and in which Colonies was it forbidden.—Mr. D. R. REES-WILLIAMS replied: In none.

Foreign Workers

Mr. G. H. OLIVER asked the Minister of Labour whether he was aware of the low medical grade of many of the foreign workers admitted into this country and the resulting high rate of sickness among these workers; and whether, in view of the present difficulties in staffing and finding accommodation in our hospitals and sanatoria, he would seek authority to have all foreign labour adequately medically examined in *the country of origin before allowing their entry into this* country.—Mr. GEORGE ISAACS replied: Foreign workers recruited under official schemes for which I am responsible are already required to undergo a general medical examination, and an X-ray examination to detect tuberculosis, before they are accepted and brought to this country. In proportion to the numbers recruited, the cases of serious sickness have not been numerous, but as these workers are mostly displaced persons the privations which they have undergone may have resulted in some cases in breakdown in health after their arrival.

Public Health

Poliomyelitis

THE number of notifications in the week ended July 23 was poliomyelitis 96 (112), polioencephalitis 3 (5). Figures for the previous week are shown in parentheses. This is the second time since the seasonal rise definitely began in the week ended June 11 that the weekly notifications have been fewer than in the previous week. In 1947 the rise was remarkably steady once it had set in and the figure for the week ended July 19 (corresponding to the present week) was 193. This may portend a flattening of the curve of incidence. Multiple cases (poliomyelitis and polioencephalitis together) were reported from the following counties: London 7 (13), Berks 3 (2), Cumberland 2 (2), Devon 7 (9), Essex 4 (3), Gloucester 2 (6), Lancs 8 (7), Leicestershire 6 (2), Middlesex 11 (11), Northumberland 2 (0), Southampton 8 (14), Suffolk East 2 (0), Suffolk West 3 (1), Surrey 3 (4), Sussex East 2 (2), Yorkshire, West Riding 17 (19).

Film for the General Public.—In addition to the film for doctors, "Polio: Diagnosis and Management," mentioned in this column last week, a short film for the general public entitled "His Fighting Chance" will be shown in ordinary cinemas from Aug. 8 onwards. This deals with the modern technique of reablement after poliomyelitis, and the commentator is Mrs. Roosevelt. The running-time is 10 minutes. Copies will be obtainable from the Central Film Library, Imperial Institute, South Kensington, from about Sept. 1.

Births, Marriages, and Deaths

BIRTHS

BEYNON.—On July 27, in London, the wife of Dr. A. E. Beynon—a son.

GILMOUR.—On July 24, at Hayes, Middlesex, the wife of Dr. S. J. G. Gilmour—a son.

LOVETT.—On July 5, at Hargeisa, British Somaliland, the wife of Dr. W. C. D. Lovett—a son.

NAUTH-MISIR.—On July 25, at Romford, the wife of Dr. T. N. Nauth-Misir—a son.

SIMMONS.—On July 19, the wife of Dr. R. W. Simmons—a son.

MARRIAGES

BOWER—AITCHISON.—On July 26, in Birmingham, Brian Douglas Bower, M.B., to Pamela Mary Christine Aitchison, M.B.

LYLE—MAXWELL.—On July 23, at Peppard, Thomas Keith Lyle, C.B.E., M.D., to Jane Bouverie Maxwell.

MEIKLEJOHN—ASHFORTH.—On July 16, at Hayes, Middlesex, William Meiklejohn, M.B., to Audrey Jean Ashforth.

DEATHS

BARR.—On July 22, at Torquay, James Barr, M.B. Glasg., D.P.H., aged 81.

BREW.—On July 23, Richard William Brew, B.A., M.B. Dubl.

FEGAN.—On July 26, at Leverstock Green, Herts, John Herbert Crangle Fegan, M.R.C.S., aged 77.

JOHNSTON.—On July 26, in London, Loiza Elwell Johnston, M.R.C.S., aged 77.

O'NEILL.—On July 27, at North Cheam, Surrey, William O'Neill, M.B. N.U.I., aged 57.

ROSSER.—On July 25, Richard Picton Rosser, M.B. Edin.

WAGSTAFF.—On July 25, Charles Bertrand Wagstaff, M.R.C.S.

Notes and News

THE MATERNITY SERVICE

PRACTITIONERS will shortly receive from local e councils a statement, prepared by the Standing M and Midwifery Advisory Committee and endorsed Central Health Services Council, which speaks of standing about the nature of the medical services a for the expectant mother who is to be confined in home. There is, it says, a widespread belief among practitioners and the public that the agreement be doctor and a patient by which the doctor unde provide maternity medical services converts the what is commonly known as a "doctor's case" doctor accepts full responsibility for the antenatal the labour, and for the lying-in period. "This was not the intention: it was not intended in any way to the importance of either the antenatal clinics or the by the introduction of the maternity medical service the payment of a comprehensive fee, a general prac undertakes to examine the patient at the time of and at about the 36th week; to make a postnatal ex about 6 weeks after confinement; and to provide a tional medical attention if he considers it necessar response to a call from the midwife. *He is not* req undertake the more frequent routine antenatal su that is essential, nor to attend the labour, unless suc dance is considered necessary by himself or by the He may, of course, provide additional services if he so his remuneration being unaffected thereby. "The must undertake regular antenatal supervision even duplicates the examination of the general practitione the doctor makes it quite clear that he accepts full responsibility for the case during pregnancy, labo lying-in period. The general practitioner may of assume these full responsibilities if he considers it n But it is the hope of the Minister that, in domicilia wifery, the midwife will continue to be regarded as the attendant, supported by the antenatal clinic dur pregnancy, and working in coöperation with the practitioner who has had the opportunity to satisfy that there are no deviations from the normal in the general health during pregnancy nor obstetric compl towards the end of pregnancy and will come to he trouble arises during labour or the lying-in period. T wife will consider herself to be acting as a practising unless she has been informed to the contrary by the

REPEAT PRESCRIPTIONS UNDER N.H.S.

WHEN a doctor considers that his patient's treatmen *continue for longer than the first supply of* medicine and it is not necessary to see the patient again for sor if at all, the doctor may issue two or more prescript carbon copies of the same prescription bearing signatures) dated at suitable intervals. This applies medicines and dressings. The aim is to save the docto

LONG-TERM MEDICAL CERTIFICATES

NEW regulations laid before Parliament last week James Griffiths, Minister of National Insurance, allow certificates for sickness benefit to be given at longer i in cases of protracted illness. Hitherto a chronica person has been able to submit special intermediate certificates at intervals up to eight weeks—but onl was not seeing his doctor for examination or tr more frequently. The patient who had to see his every week for a renewed prescription or an inject to submit weekly certificates, though both the doc the patient knew that the illness was going to last a lo

The new regulations, which came into operation on extend the intervals at which a special intermediate certificate may be given in cases of protracted illne eight weeks to thirteen weeks, and enable such cer to be given even though the sick person is being e or treated by the doctor more frequently. This down some of the routine certification work of doct will also reduce the number of times the patient has documents to the local National Insurance office.

The regulations have been made provisionally pe report on them by the National Insurance Advisory Co The committee will consider objections to them wl sent before Aug. 26, to its secretary, at 6, Curzon London, W.1. The preliminary draft of the regulatio

TWENTY-FIVE YEARS OF BILIARY SURGERY*

WALTMAN WALTERS
M.D.
ON OF SURGERY, MAYO CLINIC, ROCHESTER, MINNESOTA;
ROFESSOR OF SURGERY IN THE MAYO FOUNDATION

1920–23, when I was a fellow in the Mayo Foundation, iagnosis of lesions of the biliary tract depended on valuation of a carefully taken history of the patient's s, and on the results of a physical examination. The ry was considered to indicate disease of the biliary when a qualitative type of food indigestion had red shortly after eating, particularly the gas- ing foods. This was especially important if attacks were pain in the right upper quadrant, or in the strium extending through to the back, were ciated with this indigestion. It was necessary to ide ulceration of the posterior wall of the duodenum, crisis-like attacks of pain; but the more frequent onse of this type of pain to ingestion of food, and the onstration of a crater shadow in the duodenal ulcer radiography, indicated that the lesion was in the denum.

arman's radiological demonstration of gastric and denal lesions was an outstanding contribution to gnosis at that time (Carman and Miller 1917). He attempted to demonstrate an abnormally functioning -bladder by using X-ray exposures of varying inten- . Kirklin (1922) described the clinical significance of ositive shadow in the region of the gall-bladder in ie cases of cholecystitis, and Rowntree attempted lisplay the gall-bladder by administering phenolated ogens, one of which (phenoltetrachlorphthalein) he l previously used to study the function of the liver el and Rowntree 1909). His test of liver function, proved by Rosenthal (1922), is still a valuable aid to determination of hepatic function.

n 1924 Graham and Cole began the study of chole- itography after intravenous administration of different mbers of the halogen group. They were able to show t concentration of the dye occurred in the gall-bladder, d that with X rays it could be seen either filling or ptying when normal, or failing to do so when diseased. adows made by gall-stones also would be shown in ny cases. Later, oral administration of the dye oved of great value in confirming a clinical diagnosis disease of the gall-bladder and likewise of excluding it. jaundice complicated the clinical history, if it followed attack of pain in the right upper quadrant of the domen and was fluctuating, a stone obstructing the mmon duct was suspected; for such stones seldom st an X-ray shadow. If the jaundice was painless, intrahepatic disturbance was distinguished from an structive lesion of the pancreas, of the ampulla of ater, or of the duct itself, by the presence of bile the stool in the former and its absence in the tter.

These clinical evaluations still form the basis of most rrect diagnosis of biliary tract lesions. Laboratory sts, now as then, have their greatest value when the sults are reviewed in connexion with the patient's story of his disease and with the findings at the time physical examination. One reason for this is that in any cases stones are present in a diseased gall-bladder ut are not demonstrable by cholecystography, although e disturbed function of the gall-bladder is evidenced y poor concentration of dye, and gall-stones may e present in a gall-bladder that fills and empties atisfactorily at the time of cholecystography.

The lay public began to recognise the value of laboratory procedures in the diagnosis of specific diseases, and not infrequently a patient who was having symptoms from a mild degree of dysfunction of the gall-bladder asked whether or not "X rays of the gall-bladder show stones."

TESTS OF LIVER FUNCTION

I have referred to the Rowntree-Rosenthal test which in the '20s was about the only good test for determining the function of the liver in the absence of jaundice. I have also spoken of the clinical methods used twenty-five years ago in the determination of the cause of jaundice. Noteworthy advances have been made in the last few years in studies of hepatic function and hepatic disease, particularly in cases of jaundice. Here again, however, the tests are valuable when used in conjunction with the better-known clinical methods of determining whether the jaundice is intrahepatic and non-amenable to surgery or is due to an extrahepatic obstruction, in which case surgical treatment is urgently needed. I should like to emphasise, however, that no single laboratory test can be relied on to give an index of hepatic function or to indicate the type of dysfunction present if the results of the test are contrary to those of other laboratory tests or clinical tests.

The laboratory helps to provide answers to four questions:

(1) Are other constituents of bile besides bilirubin present in the patient's serum? If so, there is a strong possibility of extrahepatic block.

(2) Does the blood contain an excessive amount of globulin, and is the albumin-globulin ratio reversed? If so, some form of degenerative or distinctive disease of the parenchyma of the liver is probably present.

(3) Does the bile reach the intestinal tract? If so, the likelihood of neoplastic obstruction is not great.

(4) Does the prothrombin-time fall promptly after the administration of naphthoquinone (vitamin K)? If so, the parenchyma of the liver cannot be totally destroyed and there may well be an extrahepatic block.

These individual problems will be considered briefly.

Blood lipids as a rule are increased in cases of obstructive jaundice and decreased in cases of severe hepatic injury. The study of cholesterol, cholesterol esters, and alkaline phosphatase in the serum is not entirely satisfactory because of technical difficulties. The simpler turbidimetric procedure of Kunkel (1947), involving a phenolsodium chloride solution, promises to give close agreement with the total lipid content; a high degree of turbidity is found in obstructive jaundice and normal levels in primary disease of the liver.

The gamma-globulin of the serum is increased in hepatitis and the serum-albumin is decreased. The cephalin-cholesterol flocculation test of Hanger depends on these changes. It not infrequently gives positive results in cases of obstructive jaundice. The thymol turbidity and flocculation tests are less subject to error. Kunkel has devised a still simpler and highly reliable method of checking serum-globulin by the use of turbidity which is consistently found in hepatitis; normal results are the rule in obstructive jaundice.

The two simple tests devised by Kunkel et al. (1948) may be used as a basic screening procedure of considerable value. The degrees of turbidity obtained with the two tests are usually roughly reciprocal one to another, and, as Maclagan (1944) said of simultaneous determinations of alkaline phosphatase and thymol turbidity, these two turbidity tests will differentiate medical from surgical jaundice in about 3 out of 4 cases.

The best proof of complete occlusion of the bile passages is the demonstration of less than 5 mg. of urobilinogen in the fæces in twenty-four hours, and of

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Donald Church Balfour lecture delivered at the University of Toronto on April 26, 1949

Royal College of Surgeons of England

At a meeting of the council held on July 28, with Sir Cecil Wakeley, the president, in the chair, it was decided on the recommendation of the Faculty of Dental Surgery to institute an annual dental lecture to be entitled the Lord Webb-Johnson lecture. Dr. J. Hall Best, president of the 12th Australian Dental Congress, was elected to the fellowship in dental surgery.

The Hallett prize for 1949 was awarded to G. R. Anderson (Queensland).

Diplomas of membership were granted to the following:

C. A. McCl. Aitken, G. W. Bainbridge, J. F. R. Ball, Qazi Abdul Bari, Eleanor H. Barrington, A. T. Barwood, Leon Bornstein, J. A. Blundell, I. I. Bornstein, Christine A. Bratt, J. E. Breese, Patricia L. Broadhead, D. E. Brown, H. J. Burns, R. A. Chesterfield, R. E. Citrine, E. G. Clarkson, K. R. J. Coates, Benjamin Crawshaw, P. J. Crosland-Taylor, J. R. Cross, Patricia A. Crowther, Thelma W. Dafforn, Brenda L. D'Arcy, D. M. Davies, I. B. Davies, Lorna C. Davies, J. G. Elliott, Gerald Ellis, Valerie M. Ellis, K. A. Etherington, M. N. Fergusson, Barbara M. Fessey, O. O. F. Ffooks, Gordon Fleet, E. A. Foreman, W. G. C. Forrester, Yvette A. P. Franklin, Raymond Gathercole, Patricia M. Gilbert, H. S. Glatt, Helen Gordon, Hugh Gough-Thomas, S. S. Grové, A. O. Hagger, R. E. Hancock, Josephine Harper, W. H. Harper, P. H. R. Hawkes, K. M. Herd, Patricia Herdman, J. J. B. Hobbs, T. H. Hughes, Sheila M. H. Hugh-Musgrove, Margaret M. Ives, Harry Jackson, O. H. James, W. B. Jennett, C. H. Jones, Peter Kelly, Ian Kent, D. S. Kerr, Ann Kiln, W. B. Knapman, N. B. Kreitman, Kazimierz Kuczynski, J. W. Latham, Mary I. Legg, J. C. Linn, H. K. N. Lister, Marcia McArthur, John Mander, W. K. Marshall, Pamela G. L. W. Mason, Shanti Narain Mathur, D. G. May, Jit Shrimukh Mehta, Margaret L. Meikle, R. R. Middleton, J. B. Millard, D. D. Miller, K. E. Mortimer, G. M. Muller, Q. F. Neethling, N. H. Newman, R. L. Newman, G. J. Nicholas, D. H. Nixseaman, P. L. Norman, C. P. B. Parry, P. T. Perkins, C. D. Peters, S. T. H. H. Pilbeam, K. N. J. Pocock, C. O. M. Priday, Suzanne L. Quittner, Joscelen Ransome, J. A. Rassell, Regina Reif, W. M. Savery, Helmuth
ld, E. M. Sklar, June M. Smith, Susan
J. G. Sowerbutts, G. D. Stones, Medora
Frederic Tavill, J. M. Thomas, P. W.
I. M. Webster, Jean I. Whittle, W. B. M.
Young.

The following diplomas were granted jointly with the Royal College of Physicians:

D.P.H.—Bashir Ahmad, Bashir Ahmad Bhatti, Mary Brooks, T. H. Elias Griggs, W. E. Hadden, D. G. Levis, Gim

D.T.M. A. F. H. Stewart, S. W. W. Terry.

D.M.R.D.—D. Chisholm, J. J. Wallis.

Royal College of Surgeons of Edinburgh

At a meeting of the college on July 27, with Mr. Frank Jardine, the president, in the chair, the following were admitted to the fellowship:

C. E. L. Allen, Frederick Baar C. S.
Campbell, Burjor Cavas Dastur, Pa Drum-
mond, J. M. E. Jewers, D. H. King ePhee,
J. J. MacPherson hmoud
Ahmed Radwan, ussein
Saadi, Nagaling Humara Sayeed,
Rabindra Naray M. Stratton, P. A.
Thorpe, H. S. Tr

Scottish Conjoint Board

Having passed the final examination, the following have been admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow:

A. E. Barr, Margaret H. Batty, Constance E. Bolton, W. E.
Bennie, M. nan, D. G. Brown, E. L. R.
Brown, W. Cargill, S. L. Chinchin, L. I.
Davidson, Daya, James Devine, D. J.
Docherty, E. Ferguson, L. M. Foegal,
Vincent Gallone, G. T. W. Gowdie, Joan F. Greaves, Muriel S. Hill,
D. D. Hillier, J. B. M. Hirst, Harold Jackson, James Jackson,
R. G. Jacomb, Ruth W. Joelson, Valerie
J. D. Keir, Rosemary C. Kennedy, R. C. L
, D. B. Murray, R
Page, Basil Raebu
itz Starer, Cornelius
T. H. Walker, B. T.

Royal Appointment

Surgeon Rear-Admiral F. G. Hunt, C.B.E., has been appointed honorary physician to the King in place of Surgeon Rear-Admiral J. A. Maxwell, C.V.O., C.B.E., who has retired.

Nuffield Foundation Visitors

The panel chosen this year to visit the Colonies as informal and unofficial consultants is as follows: Dr. E. R. Cullinan, Prof. R. C. Browne, Sir Stewart Duke-Elder (East Africa); Dr. Robert Lees, Prof. B. G. Maegraith, and Prof. R. W. B. Ellis (West Africa).

Royal Institute of Public Health and Hygiene

On July 21 Mr. W. E. Tanner, chairman of the e committee of the institute, presented the Harben Lord Boyd-Orr, M.D., F.R.S., formerly director-general United Nations Food and Agriculture Organisation, Smith award to Dr. M. T. Morgan, medical officer of for the Port of London.

Typhus in Afghanistan

News of a louse-borne typhus epidemic in Afg has reached the World Health Organisation thro regional office at New Delhi. This office is sending and D.D.T. to Kabul, and the Washington regional of the Pan-American Sanitary Bureau has supplied ad vaccine direct.

London Executive Council

At a meeting of this council on July 28 it was that payments during the first year of the National Service totalled £8,648,185 and that the administratio was only 1·25% of the whole. Details of the exp are: medical services, £2,627,614; dental services, £2, ophthalmic services, £1,693,767; pharmaceutical £1,918,188; administration, £108,084. The number of tests made in the year was 702,916, and the amount ophthalmic services is only for glasses actually dispe

Remuneration of Hospital Nurses

In a memorandum to hospital authorities the of Health says that considerable numbers of nurses hitherto been employed in hospitals at rates of remun and under conditions of service which do not accord the recommendations of the Rushcliffe Committee; has been notably the case where nurses have been em through the agency of nursing coöperations and organisations which themselves fix fees and charge missions." Now that rates of remuneration have settled by the Whitley Council for certain classes of the Ministry deems it essential that all arrangements aff these classes which are not in accordance with the rates and conditions shall be quickly brought to a "In no circumstances should any new nursing st engaged after the receipt of this memorandum on differing from those recommended by the Rushcliffe Com or agreed by the Whitley Council, as the case may be

Beit Fellowships for Medical Research

Sir Alfred Beit has resigned from the board, and Mr. Hornby has been elected as a trustee in his place. Simonds has been elected a trustee in place of the late du Parcq. The following awards have been made:

JUNIOR FELLOWSHIPS

D. V. BATES, M.B. Camb. To carry out research on resp function: at the Dunn laboratory, St. Bartholomew's H London.

Oxfd. To study the mechanism
pituitary hormones: at the de
anatomy, University of Oxford

B. CINADER, PH.D. Lond. To investigate the format multiple antibodies to a single antigen and to examin properties: at the Lister Institute of Preventive Medicine,

J. T. DAVIES, PH.D. Lond. To investigate the nature excitation of living cells by examining the closely similar built-up films of materials which recent work suggest to be sible for the permeability of cell walls: at the Royal Insti London.

D. T. ELMORE, B.SC. Lond. To examine the hydroly nucleic acids: at the university chemical laboratory, Cambr

A. S. JONES, PH.D. Birm. To study the immunochemi bacterial nucleic acid complexes: at the A. E. Hills labora chemistry department, University of Birmingham.

JUNE LASCELLES, M.SC. Sydney. To study the metabolic f of folic acid and *p*-aminobenzoic acid: at the departm biochemistry, Oxford University.

E. REID, B.SC. Aberd. To study the pituitary growth horm relation to metabolic processes: at the school of bioche University of Cambridge.

B. D. WYKE, M.B. Sydney. To carry out quantitative stu the electrical activity of the brain in patients with central system disorders: at the department of surgery, University of and Radcliffe Infirmary, Oxford.

Course on First-aid

A fortnight's course on first-aid and home nursing is to on Sept. 3 at St. John House, 15, Collingham Ga London, S.W.5, under the direction of the St. John Amb Association. Further particulars may be had fro warden.

patectomised dogs could be kept alive for several y the intravenous administration of glucose, was given intravenously to jaundiced patients. as, with an adequate intake of protein, and trans- of blood when necessary, were of the greatest making these patients better risks for operation. ar programme carried out after operation was of mportance.

l fields of surgery, when one's interest is engaged particular problem, and there is opportunity to and operate on an increasing number of patients, l judgment and the technique of operation e. In my experience my desire to approximate ls of the common duct after the excision of a stric- s led to a more diligent search for the lower end of mmon bile-duct in recent years, which has been ed by choledochocholedocostomy (union of the the duct) in a much higher percentage of cases had previously achieved. Moreover, since I ised that it should be possible to find at least a of hepatic duct beyond the liver, I have been find one on many occasions, though at first, after ng the hepaticoduodenal ligament, there seemed o portion of the unstrictured hepatic duct beyond ver. By dissection into the hilus of the liver, ntly a narrow rim of duct can be identified. Then ction on this with Allis forceps the parenchyma of er can be dissected away for a sufficient distance, t the duct is long enough to be anastomosed to the num in most cases. In 9 cases in the early series 13 in the later, I was able to find a dilated intra- c duct by insertion of an aspirating needle at m in the vicinity of the hilus of the liver. When duct was found an incision was made into the substance along the needle and a catheter was uced to drain the intrahepatic ducts effectively. In l of these cases the pressure of the catheter against de of the duodenum after operation produced a opening in the duodenum, and an internal fistula ped between the intrahepatic opening and that in odenum. Six cases of this type have been reported arvin and me (1948).

operations which I have described for use in the nent of stricture of the common and hepatic in spite of the seriousness of the lesion and its ications have given the following results:

f the patients on whom choledochoduodenostomy, aticoduodenostomy or choledochocholedocostomy was ormed from 1924 through 1939 at the clinic, approxi- ely 62% were living and well at the time of follow-up 940.

f the group who had sufficient common duct above the ture, so that anastomosis to the duodenum was per- ned, approximately 80% were living and well (Walters Phillips 1949).

CLINICAL AND LABORATORY INVESTIGATIONS

iscussion of stricture in cases of obstructive jaundice s me to refer to the opportunities for clinical and imental investigation in such cases and the practical ability and sometimes the far-reaching value of studies.

eral years ago, in dissecting the stump of the ic duct from the liver in order to give it sufficient to anastomose it to the duodenum, a small ng was inadvertently made in the duct above the omosis. Leakage of bile occurred from this opening. bile accumulated below the liver and was in turn ovement of the diaphragm drawn above the liver. en depressed and rotated the liver in such a way the circulation of the inferior vena cava was inter- with and a shock-like condition resulted. This tion was characterised by an increase in pulse and atory rates and a drop in blood-pressure. The nt's incision was opened in her room the evening of the operation and bile was seen to gush from above the liver. After this the patient's pulse and respiratory rate decreased progressively and rapidly, the blood-pressure rose, and she recovered within a few hours from the shock-like condition, and in a normal period from her operation.

The depression of the liver intrigued my first assistant, Dr. Kilgore, and we discussed the problem with Dr. J. L. Bollman of our Institute of Experimental Medicine (Walters and Bollman 1928). He suggested that we study the problems in the laboratory by placing a rubber glove above the liver. When the glove was inflated with air, the liver was depressed and had partially rotated around its ligaments; it occluded the returning circulation from the inferior vena cava and the same changes in pulse and respiratory rate, and blood-pressure occurred as had occurred in the patient. We could reproduce the shock-like condition at will by either depressing the liver or clamping the inferior vena cava.

A few years later bleeding from the gall-bladder fossa in a jaundiced patient caused the blood to accumulate above the liver. When it clotted, the liver was depressed and rotated. Although the patient's condition was extremely serious as a result of the shock-like conditions which have been described, she was brought to the operating-room, the incision was opened, and large clots were removed from between the liver and the diaphragm. She improved immediately and recovered completely. I might say that she had not lost an excessive amount of blood, and loss of blood was not responsible for her shock.

In this regard Dr. Bollman has told me of the studies made during the war on the causes of blackout among the dive-bombing pilots or among subjects exposed to centrifugal force in the human centrifuge as well as in an airplane dive. In both circumstances some downward drag and partial rotation of the liver occurred, which was partly responsible for the drop in blood-pressure, and the decrease in the blood draining from the abdomen and lower extremities to the heart, evident in blackout. The blackout or shock-like condition was counteracted in part by the wearing of a very tight abdominal belt which prevented the descent of the liver. More recently descent of the liver has been further prevented by having pilots assume a reclining position.

Another problem which intrigued me arose in cases where biliary stricture was so complete that the only treatment possible was introduction of a catheter into one or both intrahepatic ducts. When catheters were introduced into both ducts we were able to compare the output of bile and its constituents, bile pigment and bile salts, from the two lobes of the liver, and to compare the findings with regard to the proportionate size of liver, the amount of obstruction to one or both ducts, and the rapidity of recovery. Of practical importance is the fact that although the estimation of bile salt in the bile is a better indication of hepatic function than of excretion of bile pigment, yet the latter is a rough and reasonably accurate means of determining liver function. In other words, the excretion of a normal amount of normal-coloured bile from the liver indicates good function.

In recent years the pathological physiology of the common bile-duct has attracted the attention of observers in many countries. Included among them are Mirizzi (1933) of Cordoba, Argentina, Bergeret and Caroli (1947) of Paris, Mallet-Guy et al. (1947) of Lyons, France, Best (1937) of Omaha, Nebraska, Overholt (1931) of Boston, McGowan et al. (1936) of Rochester, Minnesota. Several years ago McGowan and Butsch, when they were working with Gray and me, became interested in studying pressure within the common bile-duct of patients who had had attacks of seeming biliary colic after cholecystectomy and in whom stones in the common duct were not found at secondary operation. By the introduction of a complete absence of urobilinogen in the urine. These studies are exacting and difficult for general use. Duodenal drainage if carefully done gives about the same information, provided that the position of the tube is checked by screening.

Quantitative data on the degree of hepatic damage in the presence of jaundice are difficult to obtain. Determination of the rate of synthesis of hippuric acid, at one time believed to be a reliable guide to liver function, has been largely abandoned. The response of an elevated prothrombin-time to vitamin K gives useful information in this respect, since a prompt response implies a fairly large number of functioning liver cords. If any reasonable response is obtained, it suggests the presence of fairly good hepatic parenchyma and an extrahepatic block.

Where the laboratory aids mentioned give discordant results or data at variance with the history and physical findings, biopsy of the liver with the Vim-Silverman needle may prove extremely helpful. It is especially useful in distinguishing the various residues of infective (viral) hepatitis and is always worth considering if such a condition is suspected. In my opinion it should be done under surgical supervision because of the danger of hæmorrhage.

CLINICAL EVALUATION

I have referred to the development of cholecystography and should like briefly to evaluate it when it is used in present methods of examination. At the Mayo Clinic great dependence is placed on the cholecystogram which demonstrates abnormal function, and equal importance is attached to the cholecystogram which discloses normal function in a case in which there is no history of disease of the biliary tract. When, however, there is a history of typical biliary colic, or a history of gaseous dyspepsia that has persisted in spite of attempts at control by medical means, we believe that surgical exploration of the biliary tract, as well as exploration of the stomach, duodenum, and appendix, is advisable, even though radiological studies of the gall-bladder, stomach, and duodenum do not disclose any abnormality. Mention is made of the stomach and duodenum because an ulcer on the posterior wall of the duodenum which has perforated into the pancreas frequently produces œdema of the head of the pancreas, with secondary disturbance of motility of the pancreatic portion of the common bile-duct and a mild degree of jaundice. Conversely a diseased gall-bladder may produce symptoms that mimic in some respects those of peptic ulcer. This is due in part to associated gastrospasm or pylorospasm. In addition the diseased gall-bladder may produce gastro-intestinal bleeding in the absence of gastro-intestinal ulceration. The reasons for this are not entirely clear.

When the patient gives a history of biliary colic, the decision as to whether surgical treatment should or should not be employed ought not to be too greatly influenced by the absence of gall-stone shadows or the number of gall-stones appearing in the X-ray film; for there is at least a 10% error in this respect.

In recent years there has been an unfortunate tendency to deny operation to patients who have had symptoms of cholecystitis but who do not appear to have any stones in the gall-bladder on radiography. This may be due to the publication of papers on the so-called medical treatment of cholecystitis. The fallacy of withholding operation from this class of patients is apparent in view of the foregoing discussion. To allow a patient who is in good condition, except that he or she has cholelithiasis, and for whom the risk of cholecystectomy is less than 1%, to proceed to the point of experiencing acute obstruction of the cystic duct or of the common bile-duct, with resulting complications which increase the risk of operation and reduce the completeness of the surgical cure, seems to be unjustifiable.

SURGICAL PROBLEMS FOR BENIGN CONDITIO

The relation of the hepatic artery and its
to the hepatic, the cystic, and the common b
varies more than any other anatomical relatio
the abdomen. Unless extreme care is taken in
the structures of the hepaticoduodenal ligam
anomalous hepatic artery or one of its branches
injured and infarction of the right lobe of the l
death may result. Likewise the attempt to contr
ing from such an artery blindly may result in a
to the common bile-duct at a very high level. So
the infection in the gall-bladder, with its extens
the hepaticoduodenal ligament, has produced s
induration and œdema that the anatomic mar
these structures are lost, and a segment of comm
is removed with the gall-bladder. In cases in w
degree of infection is great, and it has extended
hepaticoduodenal ligament, all but those skilled in
of the biliary tract would do well to be conte
drainage and removal of stones from the gall-
Cholecystectomy should be reserved until a lat
when the cholecystitis has subsided.

In the surgery of cholecystitis, one of the p
most distressing to me has been the increasing fr
with which it has been necessary to operate on
whose common bile-duct has been injured at t
of operation on the gall-bladder and a strict
resulted. This has necessitated an operation or op
of considerable magnitude on patients who are
good general condition. In many of these
previous unsuccessful attempts have been m
repair, not only once but often twice or three tim
sometimes four or five times.

My colleague, Snell, recently returned from a
the English medical and surgical clinics. He w
ticularly impressed with the infrequency with
stricture of the common bile-duct was seen in the
clinics there in contrast to our experience at th
Clinic.

While I am on the subject of strictures, I wish
that an accurate anastomosis restoring the
intestinal continuity is of the greatest importance
cases. If possible the ends of the duct should b
tomosed after excision of the stricture, or if
not possible the duct above the stricture sho
anastomosed to either the duodenum or the jeju

Generally speaking, the results of each type of op
will depend on the accuracy of the anastomosis a
degree of infection in the wall of the common bi
and within the liver (Walters and Friedell 1945).
tion in these structures, especially with associated
hepatic calculi, are the reasons, I believe, why cont
sometimes occurs later at the site of the anast
and another operation for relief of the obstruc
required.

In my first series of 98 cases in which operati
stricture was performed between 1924 and 193
mortality-rate was approximately 10% (Walte
Phillips 1949). In the second series of 88 cases in
operations were performed from 1940 to January,
the mortality-rate was 3·4% (2·6% per oper
This reduction in mortality-rate is a reflection
advances made in the treatment of patients with o
tive lesions of the biliary tract. Studies reveale
elevation of the prothrombin-time of the bloo
associated with a considerable degree of disturba
the liver and the tendency to hæmorrhage.
prothrombin-time could be reduced by the ad
tration of vitamin K or vitamin-K-like substance
reduction indicated that the liver cells were not
diseased. It was found that vitamin K also prev
serious postoperative bleeding. After the experin
work of Bollman, Mann, and Magath (1926), who s

for this reason the position of the needle in the should be fairly central.

oramen may face almost straight downwards, ı case the needle point may enter it only to jam its posterior lip.

ning the needle to be in the nerve and through men, we may be hindered in the fourth stage by er difficulty, which is well described by Van 921):

> ne gasserian ganglion is a very much flattened ure, and is so situated that its narrow margin is ted to a needle entering the foramen ovale. Should edle be introduced in a plane nearer to the vertical hat of the ganglion, it may readily enter the foramen, stead of proceeding on into the ganglion it will enter ibarachnoid space above it. Or, should the needle n a plane nearer to the horizontal, it will probably v beneath the ganglion capsule, where injection may de without effect."

writers ignore the dimension of this "narrow " Härtel (1914) gives it simply as 3 mm., que (1927) as "3 mm. at the most." The plexus laris where it merges with the ganglion is, if g, the thinner structure of the two, and is ly only 2 mm. thick. As it passes upwards and rds to the porus trigemini it becomes thicker s broad; but, on the other hand, the further dle point is advanced beyond the foramen ovale ater the effect of any slight error in direction.

ganglion and plexus rest closely on the anterior of the petrous bone, which in this region, apart he impressio trigemini, is flat. The needle, if it ay wholly within the ganglion and plexus, should allel with this flat surface. If there is any angle n them it must be a small one, which I propose ne the petrous-needle angle. Its value will be ith a correctly sloping needle, positive with one s too steep, and negative with one that is not nough.

ortunately the inclination of the anterior surface petrous bone is extremely variable. Zenker (1938) red the angle between it and a transverse plane g from the external auditory meatus to the root nose; he found this angle to be 55° in the longest and 90° in the shortest. Hence, if the petrous- angle is always to approximate to zero, the between the needle shaft and the horizontal must ary greatly from case to case.

Allen's analysis needs two additions: (1) by g very high through a large round foramen, or low through any foramen, a needle may run el with the anterior surface of the petrous bone et come to lie above or below the ganglion and s; and (2) a needle lodged right against the lateral edial margin of the foramen may have its point y near the corresponding border of the plexus. are two more reasons why the needle point should hrough the centre of the foramen ovale.

sum up the conditions for a well-placed needle :

The site of the skin puncture must be such that the between the needle and the anterior surface of the us bone (the petrous-needle angle) will be zero or nearly

The foramen ovale must be found, and entered lly.

The needle point must be advanced into the postero- or part of the plexus triangularis—i.e., 10–15 mm. d the foramen.

far we have dealt only with the problems inherent rmal cases. There are also some recognised abnor- ies which can cause difficulty or danger. A pterygo- us bar, though usually situated medially to the nen ovale, may lie across it and so be an obstacle. foramen ovale may be fused with either the foramen spinosum or the foramen lacerum. Härtel (1912) discusses these and similar anomalies exhaustively; Sunderland (1938) gives an excellent account of them in English.

PREVIOUS METHODS

It would be strange if no-one had tried to solve any of these problems by a radiological demonstration of the needle in situ, and this has been attempted in several ways.

Pollock and Potter (1916), desiring an aid to Harris's lateral approach, inserted both a metal bougie into the eustachian tube and the needle into the cheek, and ascertained their relative positions by screening. For Härtel's approach they favoured screening in a lateral projection without the bougie.

A paper by Dorrance (1917) includes, without explanation, a lateral radiogram of a needle passed into the foramen ovale by the anterior approach. We are left to guess whether radiography played any part in his routine of injection.

Härtel (1920, 1921) described a projection in the axis of the foramen ovale, which could show the needle almost end-on. His work was repeated and confirmed by Goetze (1921). Sicard (1924) demonstrated three cases in which, immediately after the alcohol, he had injected 1 ml. of iodised oil and exposed stereoscopic films; the oil was found to have spread remarkably widely in the subarachnoid space. This, with scant justification, he called *contrôle lipiodolé*.

Dogliotti (1930) wrote: "It is often advisable, before attempting to enter the oval foramen, to take an X-ray picture of the base of the skull so as to obtain the exact position of the point of the needle." He described this procedure, which was to be carried out under light general anæsthesia, as "rarely necessary but always useful."

Stiasny (1933) for a while used a single projection, which seems to have been not unlike Härtel's.

Kirschner (1933) and Zenker (1934), who sought to destroy the gasserian ganglion by means of mathematics, machinery, and coagulating diathermy, stated that stereoscopic radiograms in the basal projection were occasionally helpful during their onslaughts; but soon Kirschner (1936) declared them unnecessary.

Brücke (1934) described a modification of Härtel's projection. Sgalitzer and Brücke (1934) admitted that this projection did not show the depth of the needle. Before the alcohol, therefore, they injected 0·5 ml. of a thin iodised oil and took a lateral radiogram. They saw the oil lying extracranially or intracranially, and so hoped to infer the position of the needle point.

Härtel (1935) had by now evolved a complex technique, which he described none too clearly. Using only his one original projection, he combined screening with repeated radiography of the needle at an unspecified number of slightly different angles. In his masterly hands the results were excellent.

Putnam and Hampton (1936) used "a roentgenogram . . . taken along the axis of the needle guide" (a brass sleeve inside which the needle proper was afterwards passed). In their published example, however, the exterior end of the needle guide is seen well above and to one side of the other end, which lies in the foramen ovale; presumably this displacement is unintentional and its direction and extent are matters of chance. They added: "It is advantageous to take a true lateral view also, to show the depth to which the guide has penetrated." The insertion of the guide and the radiography were performed under general anæsthesia.

Lemoyne (1946) has recourse to radiograms "if the foramen ovale is hard to find or if one has the least doubt about the precise position of the needle point." He uses two projections: a basal, and a lateral centred on the temporomandibular joint.

Adler and Gál (1948a and b), in an effort to rise above the present lack of X-ray films in Hungary, use a pure screening technique with two projections at a right angle.

By no means all of these workers describe the positioning required for their special projections. All their systems have drawbacks. Screening, so careful tests have convinced me, shows the needle shaft poorly and the foramen ovale not at all. It is a complication to be avoided, and if it is used without radiography there will be no permanent record of the needle position.

radiopaque substance through the T-tube which was inserted into the common bile-duct at the time of operation, and by varying the pressure within the duct, these observers were able to demonstrate that the spasm of the sphincter of Oddi and of the duodenum increased the intraductal pressure and caused the pain of which the patient complained. They also found in the study of different substances used to decrease the periodic increase in intraductal pressure that sublingual administration of glyceryl trinitrate was followed by decrease in intraductal pressure which they were able to demonstrate radiographically and by relief of the pain. In a recent visit to European surgical clinics I saw at a clinic of Bergeret in Paris, at the Hospital of St. Antoine, a unique method for radioscopic study of the activity of the common bile-duct at the time of operation. A technician lies inside an enclosed operating-table, and a port-hole in the top of the table contained a viewing screen which enables him to make observations on the filling and the emptying of the ducts when a radiopaque substance is injected into them during operation. Spot films were taken at the proper time for immediate development and demonstration to the surgeon of the size of the biliary ducts, their ability to empty, and the presence of a stone or other defects.

MALIGNANT LESIONS

I shall not say much now about the malignant lesions of the biliary tract, which are infrequent compared with the benign ones. But with modern methods of anæsthesia, preoperative and postoperative treatment, and the improvement in surgical technique, the attack on small localised lesions of the common bile-duct, and especially of the ampulla of Vater, has been astoundingly successful. This is particularly true of the obstructing lesions of the ampulla of Vater. My colleagues, Drs. Waugh and Clagett, performed a large number of radical resections of the lower end of the common bile-duct and the head of the pancreas and the duodenum during the war (Waugh and Clagett 1946). My other surgical colleagues at the clinic and I have contributed some cases to the series. In all, as reported by Waugh (1948) the average length of life following radical resection for carcinoma of the ampulla of Vater has been 24 months and several patients have lived beyond that time. On the other hand, when the malignant lesion involved the head of the pancreas, although a few patients have lived more than 14 months, the average length of life has been only about 8–9 months. In such cases, however, the patient's jaundice has been relieved and some of them have obtained relief of the pain associated with the perineural cancerous involvement in the head of the pancreas. The risk of this operation, however, is high and will vary from 15 to 20%.

In contrast are the results of the more conservative operation of the anastomosis of the distended gall-bladder or common bile-duct to the duodenum or jejunum. This procedure, which has a low risk, relieves the patient's jaundice and itching and prolongs his life: it is well worth while.

The two operative procedures which I have just mentioned have additional values. With the recognition that many such lesions are amenable to removal, the surgeon can offer the jaundiced patient not only relief of jaundice caused by most malignant lesions, but also the chance that the surgical exploration may reveal a benign rather than a malignant lesion. If the lesion is malignant, the jaundice and the itching can usually be relieved and in some cases the lesion can be removed.

COMMENT

In the past twenty-five years the picture has changed from one in which clinical judgment received little aid from laboratory procedures to one in which, although clinical judgment is still the most important fac determination of the diagnosis of the lesion location, the laboratory can give great help in id the type of jaundice present and assessing the of the liver. The improvements in anæsthesia, administration of blood, vitamins, fluid, and el have permitted greater accuracy and less speed in operations. As a result the lesion may be re possible and necessary, or if removal is not the biliary obstruction may be relieved at a l As preoperative treatment along physiological lowered the risk of operation, so postoperative along similar lines has promoted more rapid and together they have lowered the mortality.

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A SIMPLE RADIOLOGICAL AID T GASSERIAN INJECTION

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THE procedure discussed here is alcoholic g injection by the anterior approach of Hartel (In placing the needle for injection we can dist four stages:

(1) Putting the needle point into the foramen ovale, it must be remembered, is a short canal.

(2) Piercing the mandibular nerve.

(3) Passing the needle point through the foramen.

(4) Piercing the gasserian ganglion and the plexus angularis. There is good evidence (Cavina 1932) that postero-superior part of the plexus is the site where smallest quantity of alcohol will produce the req anæsthesia.

ANATOMICAL DIFFICULTIES

Given a small foramen facing in a favourable dir and just the right angle between the needle shaft the horizontal, the first stage may be followed e even inevitably, by the next two; but we do not see all these conditions fulfilled in one case.

A large foramen may contain not only the mandi nerve and the accessory meningeal artery but vein or venous network of considerable size (Lind 1936, Bergmann 1942), and so may admit the point without bringing it into contact with the No doubt it is possible for the needle to skirt the in this way and yet to penetrate the ganglion, but alcohol leaking back along the path of the needl be able to reach nearby intracranial structures. better for the needle point to bury itself in n tissue at the foramen and thenceforth to remain b

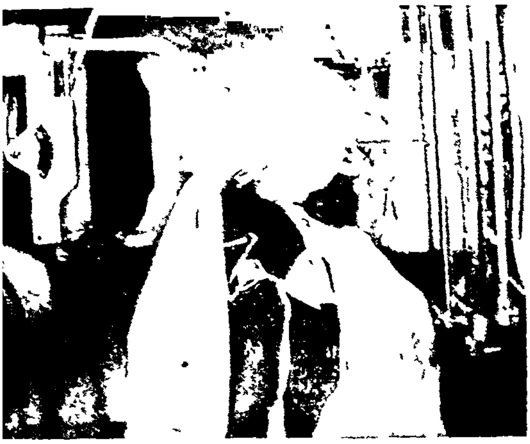


Fig. 3—Positioning for oblique view.

early parallel with the floor. Tube and table
justed for tilt and height until this line and the
f the central ray, as seen from the side, are in
nsverse plane. We now look from above and adjust
tient's head until we see the needle mount lying
ı. medial to the path of the central ray, and judge
edle point to be lying in that path. The sagittal
of the skull is kept vertical to the floor. The
f the needle and the path of the central ray now
an acute angle in a transverse plane, and they
ct at, or very near, the needle point. The needle
is medial to the path of the ray but approaches it
trace them both backwards. The outline of the
en ovale will show up clearly between the shadows
maxilla and the ramus of the mandible.

) fundamental differences will be noted between
oblique view and the otherwise similar end-on
tions of Hartel, Brücke, and Putnam and Hampton:
displacement of the needle mount is recognised
essary, is made in a definite plane and a constant
ion, and is of a small controlled extent; and
is the needle and not the patient's head which,
ut screening, is oriented to the central ray.

both exposures a diaphragm of small aperture is
to produce radiograms about 10 cm. in diameter;
n both, for ease and uniformity of interpretation,
entral ray is kept normal to the film. With a collabo-
I hope shortly to publish more detailed directions
fically for radiographers (Gee and Penman 1949).

pretation

determine the position of the needle point, we first
ine the basal film (fig. 4). This projection shows
bearing directly and obviously. It understates the

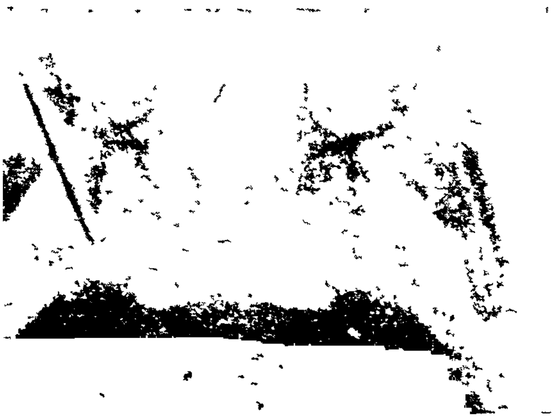


Fig. 4—Basal view.

depth because the angle it makes with the needle shaft is not the ideal 90° but usually much nearer to 45°. The divergence of the X rays and the ensuing magnification of the plane of the foramen ovale counteract this understatement, but not completely. In most cases the needle depth as measured on the film is to the true depth approximately as 4 to 5.

We now turn to the oblique film (fig. 5). As we saw during the positioning, this does not give a theoretically perfect view along the needle, because of the deliberate medial displacement of the mount. However, the silhouette of the foramen which it presents to the eye is practically the same as that presented to the needle point. The shadow of the needle shaft is horizontal, and therefore its elevation can be directly seen regardless of depth.

Combining these data, we know the position of the needle point in all three dimensions. The bearing and elevation are probably accurate within 1 mm. and the depth rather less accurate. Fig. 6 shows how this is achieved.

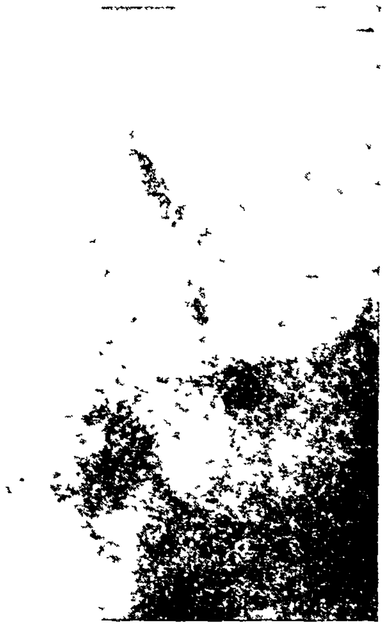


Fig. 5—Oblique view.

The petrous-needle angle must still be considered. In the oblique projection the central ray passes close to the ridge of the petrous bone before traversing the foramen ovale, and the film shows this ridge as a faint but definite horizontal line. The foramen may be partly hidden behind the ridge, just clear of it, or well above it (fig. 7), like the rising sun at various stages above the horizon. The petrous-needle angle is zero when the lower edge of the foramen seems to be just resting on the ridge. A positive petrous-needle angle will usually make the foramen appear more rounded, and a negative one more slit-like.

The two projections supply each other's deficiencies as follows:

Information required	*Given by basal projection*	*Given by oblique projection*
Depth	Yes	No
Bearing	Yes	Yes, when depth is known from basal view
Elevation	No	Yes
Petrous-needle angle	No	Yes
Shape of foramen as viewed along needle shaft	No	Yes

Adjustments

The needle can now be moved. If the petrous-needle angle is at all far from zero, a higher or lower point is chosen for the skin puncture. If the needle has not entered the foramen, or has entered eccentrically or to a wrong depth, either it is adjusted, or it is left and a second needle is introduced beside it. As mentioned by Härtel and by Putnam and Hampton, the first needle, its position being accurately known, is a valuable guide to the second.

The radiography of unconscious patients is undesirable. Lateral projections do not show the foramen; they therefore give only a rough notion of the depth of the needle, and no notion whether its position in the foramen is high or low.

A perfect end-on view of a correctly placed needle would defeat its own object, for the mount of the needle would mask both its shaft and the foramen. Where the projections are inadequate, iodised oil does little to improve them, informative though it may be in other ways. Stereoscopic films are elaborate and cannot usually be viewed in the wet state; they offer a three-dimensional picture of a sort, but it is a subjective and feeble sort, not to be compared with the certainty of two projections at a right angle. On the one hand, more than two pictures are superfluous, and, on the other, a single projection is not enough.

Above all, the proper function of radiology is not, as all but one of these writers imply, to guide the needle to the foramen ovale. Reasonable experience and care, without technical devices, should be enough in this first stage. Härtel (1933) realised this: "In these days I am no longer concerned with the problem of hitting the foramen ovale fair and square; that goes without saying. Instead I am concerned with finding the most central part of the gasserian ganglion." He, alone of the workers mentioned, states that his aim in using X rays is to refine his existing technique and to make sure of placing the needle in the centre of the foramen.

As for the thinness of the ganglion and the consequent importance of fitting the needle to the surface of the petrous bone, I have found no exposition of a radiological technique which refers to these points.

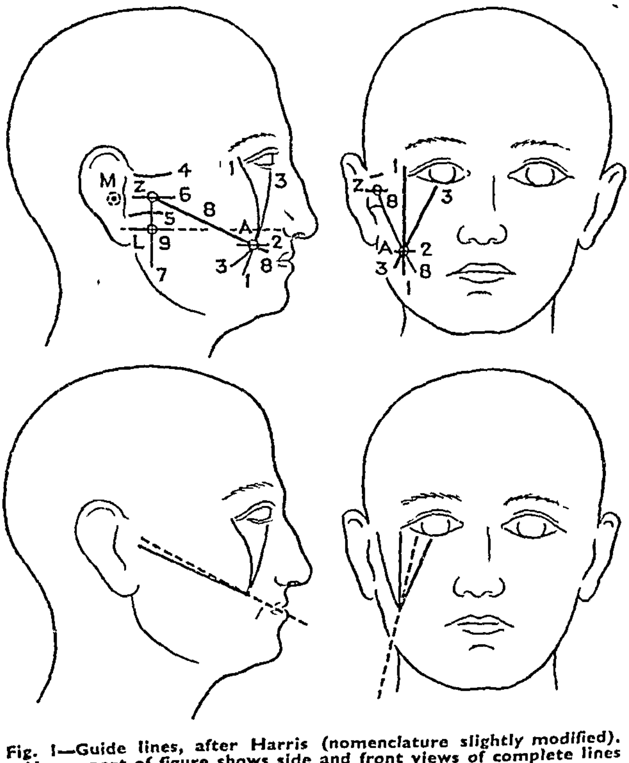


Fig. 1—Guide lines, after Harris (nomenclature slightly modified). Upper part of figure shows side and front views of complete lines for both anterior and lateral routes (numerals indicate order in which lines are drawn); 1, parasagittal line; 2, anterior cross line; 3, pupil line; 4, upper zygoma line; 5, lower zygoma line; 6, middle zygoma line; 7, coronal line; 8, elevation line; 9, lateral cross line; A, anterior point; L, lateral point; M, meatal point; Z, zygoma point (MZ = 2·5 cm.). Lower part of figure is an abstraction of the foregoing, showing only three essential lines for anterior route, with initial direction of insertion of needle.

PRESENT METHOD

Starting from the site of the skin punc borrowing two useful terms from gunnery, w that the needle point has a depth, a bearin elevation. Two ordinary radiograms in suita projections ought to give all this information. one projection should be perpendicular to t shaft to give the depth, and the other alon to give both bearing and elevation, but certain modifications will be possible. The pe projection can be rotated, so to speak, about of the shaft until it too shows either the be elevation. Each projection must also outline th ovale, which will then serve as a "grid" or frame, and the position of the needle poin completely determined. There remains the needle angle, to which we shall return.

So much for theory; the practical routine is as Preliminary films of the skull are exposed and s the basal film in particular may give warning of abnormalities. For injection the patient, withou medication, sits in a high-backed chair in the room. The guide lines advocated by Harris (193 drawn (fig. 1), and his modification of the ar approach is used.

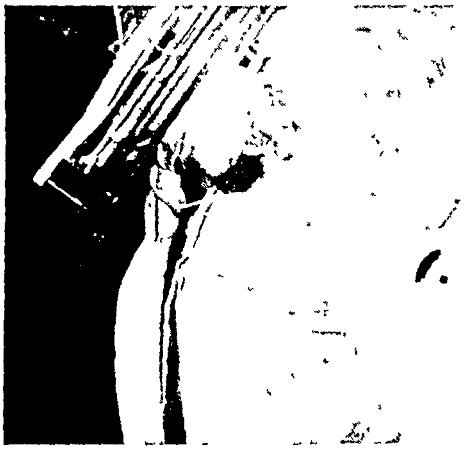


Fig. 2—Positioning for basal view.

When the needle point seems to be in the foramen minutes after puncture of the skin, whichever is s the patient sits on a stool at the X-ray apparatus. the best results this must be of the Lysholm-Schon type, which among many advantages allows the and the head table containing the film, to be r together about one horizontal axis. Two films now to be exposed.

Positioning and Exposure

Basal View.—The first film gives a modified view, the path of the central ray being parallel wi usual path but a little further forward and to the side of injection so as to pass through the fo ovale. This position is quickly found. Looking head from the side, one brings the zygoma point 1 and 2) into the same transverse plane as the c ray; looking from the front, one moves the head lat until the path of the ray lies in the same paras plane as the centre of the eyeball on the side of inj

Oblique View.—For the second or special oblique the patient has only to turn towards the side of inj through about 140°, so that he nearly faces the table, and to lift his chin as high as he can. A wedge-shaped cushion is put between the table his chin, so that the needle mount is held just of the table; by pressing his chin into the cushi steadies his head. The elevation line (figs. 1 and is a trend it is towards the cumulative success-rate %. In group 2 there is a steady upward trend, may well be due to increasing experience not of rian injection but of radiology as applied to it.

oup 1 includes 6 injections in which success was ved by the lateral approach through the sigmoid of the mandible, and in 3 of the 6 this was the approach tried. Since the introduction of the logical method the lateral approach, which is suited to it, has been tried only a few times, and

TABLE I—ANALYSIS OF INJECTIONS

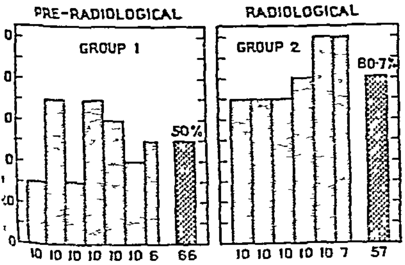
Group	First injections	Reinjections from group			All injections
		1	2	3	
-radiological ..	64 (58)	6 (6)	..	..	70 (64)
liological ..	45 (33)	7 (7)	3 (0)	2 (2)	57 (42)
e text)	8 (7)	0	0	0	8 (7)
Total	117 (98)	18 (15)			135 (113)

Cases of tic douloureux in parentheses.

er successfully. If these facts influence our comparison ll, they can only favour group 1.

o distinction has been drawn between patients had already been injected by other workers and se who came with untouched ganglia. "First injec-t" means a first injection from me. All injectors other people's failures rather more difficult than h cases; the probability of an anatomical abnormality reater, and the previously injected alcohol may have sed fibrosis. Both in group 1 and in group 2 the cess-rate is a little higher if only fresh cases are en, but the difference is unimportant, and nothing uld be gained by complicating the tables with it.

Both these success-rates of 50% and 80% may seem atisfactory, but they are artificial and have no close ation to the patient's idea of success. The follow-up examinations have shown that technically inadequate degrees of sensory impairment may be followed by long periods of relief. Patients to whom only procaine injections could be given may be free from pain, and may even believe that eir faces are numb, for many months. A number of e two-day failures might easily have been called successes immediately after injection. Such facts must be membered by anyone seeking to compare these results ith those which other workers have obtained from uestionnaires. This is not to deny that the ideal result permanent anæsthesia to all stimuli in all previously ainful areas.



8—Two-day success-rates by separate tens of njections. Hatched columns show percentages or whole groups.

To the patient, what matters is whether after an jection he will want further radical treatment, and, if o, how long afterwards. The need for such treatment s the best criterion of a complete relapse. In group 1, 7 first injections for tic douloureux had to be followed y second injections or by sensory rhizotomies; in roup 2, no first injections have yet had this sequel. The following figures (which include 2 of the 4 early cases reviously mentioned as unclassifiable) give the details:

	Group 1	*Group 2*
All first injections for tic douloureux	58	33
Died in less than 3 months	1	0
Not yet followed for 3 months	0	5
Potentially in need of further radical treatment within 3 months	57	28
Given further radical treatment within 3 months ..	10	0
Not given further radical treatment within 3 months ..	47	28
Died in 3–6 months	2	0
Not yet followed for 6 months	0	3
Potentially in need of further radical treatment in 3–6 months	45	25
Given further radical treatment in 3–6 months	4	0
Not given further radical treatment in 3–6 months ..	41	25
Died in 6–12 months	1	0
Not yet followed for 12 months	0	11
Potentially in need of further radical treatment in 6–12 months	40	14
Given further radical treatment in 6–12 months ..	3	0
Not given further radical treatment in 6–12 months ..	37	14
All patients given further radical treatment after first injections	17	0

By this criterion we find that in group 1 the complete relapse-rate three months after a first injection for tic douloureux is 10 out of 57 (17%); in group 2 so far, with 28 cases, it is nil.

Though significant, these statistics convey but little of the precision, confidence, and power to reassure the patient which radiology confers. The average time devoted to an injection may be somewhat increased, but the time which patients have to spend in pain or suspense is greatly lessened. One can inject people whose fortitude would otherwise be insufficient.

Besides helping at the time of injection the radiograms are valuable in conjunction with the follow-up, and this value will grow. As more long-term results are obtained and correlated with the needle positions which produced them, it should be possible to discover more exact limits of depth, bearing, and elevation within which the chance of success will be high.

LIMITATIONS

Not all X-ray departments are suited to this work. From the radiographer it demands experience of skull radiography, interest, speed, and a readiness to take several pairs of radiograms at unpredictable moments. From the injector it demands tolerance and understanding of the radiographer's difficulties.

A few very elderly patients, when confronted with the X-ray apparatus, present a combination of deafness, bewilderment, and stiffness of the cervical spine which makes the method hard to apply. In some of the same patients, and rarely in less elderly ones, the skull is so decalcified that one cannot outline the foramen ovale

TABLE II—SEQUELS TO INJECTIONS

	Group 1		Group 2		Total
Two-day successes: ..		33 (29)		46 (36)	79 (65)
Followed for less than 8 weeks	2 (1)		0		
Died within 8 weeks ..	0		1 (0)		
Not yet followed for 8 weeks	0		4 (3)		
Total ..		2 (1)		5 (3)	7 (4)
Followed for 8 weeks: ..		31 (28)		41 (33)	72 (61)
Eight-week failures ..		3 (3)		0	3 (3)
Eight-week successes:		28 (25)		41 (33)	69 (58)
Died within 12 months ..	2 (2)		0		
Not yet followed for 12 months	0		23 (19)		
Total ..		2 (2)		23 (19)	25 (21)
Followed for 12 months:		26 (23)		18 (14)	44 (37)
Relapses of tic within 12 months		(2)		(0)	(2)
Freedom from tic for 12 months or more ..		(21)		(14)	(35)

Cases of tic douloureux in parentheses.

The time required for positioning, the two exposures, development, and interpretation is 10–15 minutes. The adjustments to the needle seldom take more than a few minutes. One pair of films is invariably exposed as a record of the needle position finally used for injection. Even for the most difficult cases three or four pairs of films nearly always suffice. The total time spent on an injection is more than would be spent by non-radiological methods in the easiest cases. It is probably rather more in those moderately difficult cases which form the majority, but in very difficult cases it is much less.

RESULTS

Between December, 1945, and March, 1949, I tried to give 135 alcoholic gasserian injections to 115 patients, 96 of whom had tic douloureux. These figures include every sort of failure, even 1 in which at an early stage of the injection, when there was every prospect of

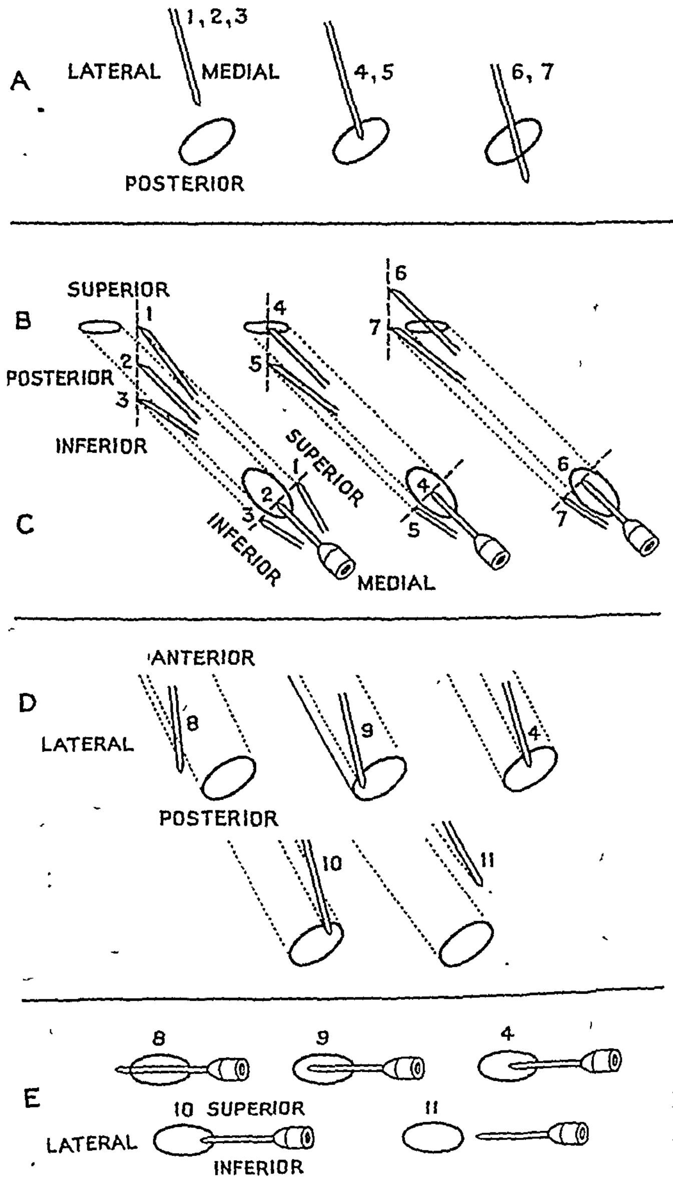


Fig. 6—Right foramen ovale with needles in eleven positions (1-11): interrupted lines, X-ray beam for basal view; dotted lines, X-ray beam for oblique view; A, basal views of three needles all with correct bearing but at various depths; B, corresponding imaginary vertical sections in plane of needles shown in A (each basal view is compatible with various elevations); C, corresponding oblique views reveal elevations of needles shown in A; D, basal views of five needles all with correct elevation but with widely different bearings; E, corresponding oblique views also reveal bearings of needles shown in D. Position 4 is ideal for piercing mandibular nerve

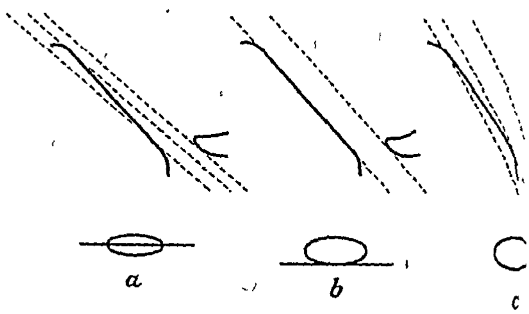


Fig. 7—Petrous-needle angle: *a*, negative angle, "sun not yet
foramen somewhat slit-like; *b*, zero angle, "sun just risen,"
men rounder; *c*, positive angle, "sun more than risen,"
still rounder. Needle shaft has been omitted from diagram
direction is that of dotted lines, which indicate X-ray
oblique projection.

success, the patient forbade me to continue.
patients were injected three times on the same side
12 twice on the same side. Two were injected on
each side; each of these four injections will be co
as a first injection. Seventy injections were given
the introduction of the radiological method (grou
57 with it (group 2), and 8, which will be ignored,
its introduction but without it (group 3). Gro
includes every injection in which the ra
method was ever tried. More details are given in t
the figures in parentheses being those for tic
Four injections given early in group 1, and
recorded, have had to be excluded as unclassi
We are left with 66 pre-radiological injection
short-term comparison with 57 radiological ones.

Criteria of Success

Trigeminal injections must be judged on
tests of sensory function made by the same obser
set intervals. In nearly every case in which at
sight the injection appeared to be a success I
examined the patient on the second day after inje
then at lengthening intervals up to the eighth
again at lengthening intervals up to the sixth m
and thereafter twice each year. My definition of su
for the purpose of this paper, is that at least in a
areas where pain had been previously felt there s
be analgesia, or some greater degree of sensory l
pinpricks. According to the interval after injecti
which this definition is fulfilled we may speak of a
day or an eight-week success. It has been possil
classify every injection, except the 4 early ones ment
above, as a two-day success or failure; 72
classifiable also on the eight-week basis.

The total number of two-day successes was 79
test the validity of this criterion of success, w
observe the sequels to these injections (table II)
figures in parentheses again refer to tic douloureu

From table II we see that of 72 two-day
69 (96%) were also eight-week successes, and th
37 eight-week successes in tic douloureux 35 (
were followed by freedom from symptoms for t
months or longer. These not very large numbers su
that in *tic douloureux* a two-day success, as de
here, means a 90% chance of at least a year's con
relief. It seems justifiable to take the two-day su
rate as a basis of comparison between the
radiological and radiological groups.

In fig. 8 these two groups are divided into batch
10, and the percentage of successes in each bat
shown separately. The cumulative success-rate is
shown at the end of each group. It will be seen tha
highest rate in group 1 (70%) is the same as the l
in group 2. It cannot be argued that the superi
of group 2 is merely due to increased experience
the fluctuations in group 1 appear to be random

this method of calculating the death-rate does not the risk of dying from a primary infection, for in irst year the number of children infected is small ared with the number infected between the ages of 1 10 or 10 and 15.

TUBERCULOSIS COMPARED WITH OTHER CAUSES OF DEATH

ie pædiatrician compares mortality from tubercu- in children with mortality from other diseases hildhood, rather than with total mortality from rculosis in the community. In table II the number eaths from tuberculosis for 1945 is set beside the ber of deaths from all causes in the same age-groups. ill be obvious that a comparison for the entire period years gives a false impression; for the large rity of deaths from other causes take place in the year, at a time when deaths from tuberculosis are eedingly few. The real significance of tuberculosis is arent in the period 1–15, when it is responsible for % of all deaths.

E II—DEATHS FROM TUBERCULOSIS COMPARED WITH ALL DEATHS IN AGE-GROUP (ENGLAND AND WALES, 1945)

Age-group	Deaths, all causes	Deaths, tuberculosis
0–1 year	31,959	307
1–5 years	6441	1004 (15%)
5–15 „	5898	897
—	44,298	2208 (5%)

THREE AGE-GROUPS

uring 1945 the 307 tuberculosis deaths in the first r form a very tiny fraction of the total 31,959 from causes. There are, however, in this first year many ses of death—prematurity, birth injury, and neonatal eases—which are not operative in other years and ich indeed are largely limited to the first three months. 1945 in these first three months deaths from tubercu- is were very few indeed, being only 22 among 22,580 ths. After this very special period of the first year deaths from tuberculosis increase, being 65 at months and 220 at 6–12 months. Thus of 9379 ths at 3–12 months in 1945, 285 or 3% were due to erculosis. Their place, relative to the chief causes of th at this period, is set out in table III, which shows,

BLE III—CHIEF CAUSES OF DEATHS IN INFANTS 3–12 MONTHS (ENGLAND AND WALES, 1945)

Bronchitis and pneumonia	3767
Enteritis and diarrhœa	1902
Congenital malformations	716
Whooping-cough	301
Tuberculosis	285
Accidental mechanical suffocation	280
Measles	238
Meningococcal meningitis	155

en all allowance is made for the difficulty of certi- ation at this age, the overwhelming importance respiratory infection and illnesses associated with arrhœa and vomiting. But it also shows that in 1945 berculosis killed as many infants as whooping-cough or easles, and nearly twice as many as meningococcal eningitis.

In table IV the six most important causes of death in e age-groups 1–5 and 5–15 years are displayed. In 45 these causes were responsible for 72·2% and 69% all deaths in the age-groups. In that year tubercu- sis was the third most important cause of death tween the ages of 1 and 5, and in the school years of -15 it was second only to death from violence and cident, being by far the greatest cause of death from fective illness. Indeed, at school age, accident and tuberculosis were together responsible for 48% of all deaths. If we then consider the death-rate from tuberculosis under the age of 15 in comparison with the death-rates from other infectious diseases as given in table 9 of the Registrar-General's Statistical Review and here set out as table V, the importance of tuberculosis is again seen. In this connexion it is interesting to recollect that in the epidemic of anterior poliomyelitis in the summer of 1947 only 267 deaths were recorded under the age of 15 years (Gale 1948). When we think of the widespread anxiety caused by this epidemic, and of the fact that more than 2000 children a year still die from tuberculosis without any apparent public concern, there seems to be need to see the disease in a new perspective and to realise that in England and Wales tuberculosis is still the most lethal disease in children of school age.

TABLE IV—CAUSES OF DEATH IN CHILDHOOD BEFORE AND AT SCHOOL AGE (ENGLAND AND WALES, 1945)

Cause	Ages 1–5 yr.	Cause	Ages 5–15 yr.
Total deaths	*6441*	*Total deaths*	5898
Respiratory disease	1325	Violence	1815
Violence	1162	Tuberculosis	897
Tuberculosis	1004	Dis. digestive system	466
Dis. digestive system	528	Respiratory disease	361
Measles	380	Diphtheria	331
Whooping-cough	254	Rheumatic fever	203
—	4653	—	4073

STATISTICS FOR NEWCASTLE-ON-TYNE

The problem in any particular locality, however, can be studied only by knowledge of local figures. Leaving the national data, let us look at the part played by tuberculosis in Newcastle-on-Tyne, an industrial city of 290,000 inhabitants, with a death-rate from tuberculosis in all ages about 50% greater than the national rate (1·03 per 1000 population in 1947).

TABLE V—DEATH-RATES FROM INFECTIOUS DISEASES (PER 100,000 LIVING UNDER 15 YEARS)

Year	Scarlet fever	Diphtheria	Whooping-cough	Measles	Anterior poliomyelitis	Tuberculosis
1939	15	228	140	34	10	237
1945	7	67	79	80	4	252

Table VI gives the total deaths and the four most important causes of death for the years 1939–47 inclusive, in age-groups 1–5 and 5–15. In the group 1–5, tuberculosis is second only to acute respiratory disease, and in the school years it is the most important single cause of death representing 26% of all deaths. Indeed, it can be seen that in 1939–47 tuberculosis was the greatest single cause of death in children of 1–15, causing 23·5% of all deaths among them. About one-tenth of all the deaths from tuberculosis in the city were at that age.

The great need for local study and assessment of the problem from year to year is emphasised by the contrast between the above figures and those published by

TABLE VI—DEATHS IN CHILDHOOD FROM TUBERCULOSIS AND OTHER CAUSES (NEWCASTLE-ON-TYNE, 1939–47 INCLUSIVE)

Age-group	Deaths in age-group (all causes)	Acute resp. dis. with measles and whooping-cough	Tuberculosis	Diphtheria	Violence
1–5 years	497	157	106	68	72
5–15 „	523	60	136	59	113
—	1020	217	242	127	185

clearly. Some paraplegics cannot manage the accurate positioning which is needed; these will mostly be cases combining tic douloureux with disseminated sclerosis.

Though it seldom happens, it is unsatisfactory when a large petrous-needle angle is found and has to be corrected by trial and error, with two or even more skin punctures. What is needed is a radiological method of preselecting the site of puncture which will make the angle zero. Work is being directed to this end with encouraging results.

WARNING

Radiology emphatically does not offer any substitute for the time-honoured and slowly learnt uses of touch and inference. Still less does it reduce the need for the precautions proper to all deep injections of drugs. These are: to use adequate landmarks; to move the needle slowly and without force; to aspirate; to inject the drug in innocuously small doses separated by pauses for observation; and, when in doubt, to stop.

SUMMARY

The theoretical advantages of combining alcoholic gasserian injection with radiology are obvious and long recognised. Previous attempts to combine them are here reviewed and criticised.

A new practical method has been devised on geometrical and radiological principles.

This method, with two simple projections and no screening, quickly locates the needle point in all three dimensions of space and in exact relation to the foramen ovale.

The positioning for these two projections is fully described; here Harris's guide lines find an additional sphere of usefulness.

An analysis of 135 consecutive attempted injections is made, and of these 66 unaided by radiology are compared with 57 aided by it. The results with radiology are decidedly better and still improving.

A warning is given against regarding radiology as an alternative to traditional skill and care.

I acknowledge my gratitude to my teacher, Dr. Wilfred Harris, for helpful criticism of this paper; to Dr. James Bull for two invaluable references to the literature, for tests of the rejected screening method, and for expert advice at all stages of the work, which owes its inception to him; to Dr. Douglas Gordon for experiments and guidance in positioning; to Mr. Wylie McKissock for constant interest and frequent encouragement; and to Miss Vivian Gee and Miss Susan Brown, past and present radiographers to the neurosurgical unit, St. George's Hospital, for their patience and accuracy.

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THE MORTALITY OF
PRIMARY TUBERCULOSIS IN CHILDH

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RECENT writing demonstrates great differen opinion about tuberculosis as a cause of death illness in children. The papers of Moncrieff (1 Wilson (1947), Wallgren (1948), Gaisford (1946), Blacklock (1947), and the correspondence which fo them, make it clear that physicians who work i tuberculosis service and are responsible for the ca large numbers of adults think that pædiatri exaggerate the importance of tuberculosis, wh pædiatricians feel that the tuberculosis service whole gives insufficient attention to childhood infe and the toll which tuberculosis exacts from the c of this country.

A statement of the facts, so far as they are k may help to explain and reconcile the two views. data I shall chiefly use are taken from the Regi General's Statistical Review for 1945, and from annual reports of the medical officers of health Newcastle-on-Tyne from 1939 to 1947. My object show the present position rather than the historical

I shall consider children to the age of 15 years be that age usually limits the period studied by pædiatrician, though it does not limit the period primary infection with tuberculosis is important.

TABLE I—DEATHS FROM TUBERCULOSIS AT VARIOUS AG (ENGLAND AND WALES)

Age (years)	1936	1939	1942	194
0–1	359 (62·6)	319 (53·5)	339 (57·5)	307 (
1–5	1046 (42·7)	915 (43·0)	1058 (46·0)	1004 (
5–10	534 (17·9)	424 (14·9)	457 (16·6)	454 (
10–15	585 (17·7)	462 (15·2)	473 (16·2)	443 (
0–15	2524 (27·8)	2120 (23·7)	2327 (27·3)	2208 (
Deaths (all ages)	27,467 (67·3)	25,623 (62·1)	25,549 (65·7) (civilian)	23,464 ((ci

Figures in parentheses are the death-rates per 100,000 liv the age-group.

Under 15 years, tuberculous disease is almost al a result of primary infection producing patholo effects either by direct spread from the primary f by implication of lymph-glands, or by generalise intermittent hæmatogenous dissemination. Wheth not we call certain lesions post-primary is simp matter of terminology; and it is generally accepted clinical disease, if it occurs at all, is usually man within a year of the initial infection.

MORTALITY IN CHILDHOOD COMPARED WITH TOTAL MORTALITY

The tuberculosis mortality in England and Wal children in various age-groups, at 3-yearly inter 1936–45, is set out in table I, which also shows the number of deaths at all ages. It will be seen that i these years the mortality under the age of 15 repres rather less than 10% of the total mortality from disease—which may explain the view current in tuberculosis service that the problem presented childhood tuberculosis is relatively small. The figure parentheses represent the death-rates per 100,000 li population in each age-group, and it will be noticed t in the age-groups represented, there is a steady fall f almost 60 per 100,000 in the first year to 16 in age-group 10–15. It must be remembered, howe l mammary lymphatic chain, the anterior medias- was explored through the second or third inter- space in 50 consecutive cases. The material for gation from these cases always included a piece primary growth and tissues removed from the y of the internal mammary artery, and usually ole breast and axillary contents. Actual lymph- were recovered from the internal mammary chain patients. In 47 cases the intercostal space was ed immediately before or during a mastectomy, 3 cases when this was done as a preliminary ure it showed such heavy invasion of the space urgery was abandoned in favour of radiotherapy. eries is continuous in the practice of one of us . H.) except for the omission of those growths 8 in number) judged too advanced for any ion, and the addition of 4 unselected cases operated colleagues, where their indulgence and chance tted us to do an intercostal-space biopsy while were performing a radical mastectomy. The first es have already been published (Handley and ray 1947), but case 1 in that paper is omitted here se it was not in the consecutive series. All the ts were operated on during the past three years ut mortality. In 3 cases no axillary glands were ble for histological examination, and they were nted invaded on clinical grounds alone, but apart this all our findings are based on histological ce. For the purposes of the accompanying table those ry growths which it was difficult to assign to the or the outer half of the breast were arbitrarily lered to be in the inner half.

table shows that the internal mammary chain nvaded in 19 cases. In 16 of these the deposits in lymphatic glandular tissue, in 2 in the connective s adjoining the internal mammary artery, and in hin the lumen of a mediastinal venule. In 3 of 19 cases the internal mammary chain alone was ed, the axillary glands being free from growth; in 16 both axillary and internal mammary glands invaded. The axilla alone was invaded in 15 cases. landular deposits were found anywhere in 16 cases. tients with fairly large growths in the upper inner rant, in whom a frozen section of the second-space had given a negative result, had deposits in the space; but in general the routine was to explore second space only. It is remarkable that, of the rimary growths in the inner half of the breast h showed glandular deposits, 12 had metastasised e internal mammary chain and only 1 had invaded xillary glands alone.

e accident occurred in the series. A very short obese an was subjected to an apparently uneventful intercostal- biopsy. Towards the end of the radical mastectomy h followed there was great difficulty in maintaining her r. A needle was put into the pleura and, after the ation of much air, her condition greatly improved. It urprising to find it possible to wound the pleura without ccident being obvious, and more astonishing still to ver by radiography that the pneumothorax was bilateral. patient made an uninterrupted recovery from the tion after aspiration of the contralateral pneumothorax, ause of which remains obscure.

ATOMY OF INTERNAL MAMMARY LYMPHATIC CHAIN

ibbe (1918) is still the authority on this subject. internal mammary lymphatic chain is subject to variation. It lies deep to the plane of the costal ilages and is plexiform round the internal mammary d-vessels. Lymph-glands are usually present opposite first, second, third, and sixth intercostal spaces, second-space gland being the most constant. The n drains the anterior chest wall, breast, anterior iastinum, and (it is to be presumed) the upper rior abdominal wall and periphery of the diaphragm. It commonly empties itself into a gland situated just above the medial end of the clavicle, and thence into the great veins, but this gland may be absent. In addition to macroscopic nodes, there are in the internal mammary lymphatic network many tiny nodes, each composed of a few lymphoid follicles only.

LYMPHATIC SPREAD OF BREAST CANCER IN RELATION TO SITE OF PRIMARY GROWTH

Lymphatic involvement	Site of primary growth		Total
	Inner half of breast	Outer half of breast	
Total cases	17 cases	33 cases	50 cases
All lymph-glands free from growth	4 ,,	12 ,,	16 ,,
Internal mammary glands alone invaded	2 ,,	1 ,,	3 ,,
Axillary glands alone invaded ..	1 ,,	14 ,,	15 ,,
Both axillary and internal mammary glands invaded ..	10 ,,	6 ,,	16 ,,

SURGICAL REMOVAL OF INTERNAL MAMMARY LYMPH-NODES

To expose the internal mammary chain is easy. To find lymph-glands is difficult because they are often exceedingly small. The method of approach is as follows:

The chest wall having been exposed (either in the course of a radical mastectomy or by appropriate splitting of the pectoralis major muscle in the direction of its fibres) over the second or third intercostal space, an incision $1^{1}/_{4}$ inches long is made in the intercostal musculature, parallel to the costal cartilages and midway between them, and extending medially to the very edge of the sternum. This incision avoids injury to the perforating arteries, two in each space, which run forward in contact with the costal cartilages. The fibres of the intercostal musculature are cautiously divided with a knife until the mediastinal fat appears or the lung is seen through the pleura to be sliding to and fro. Sharp instruments are laid aside, and dissection proceeds with two fine non-toothed dissecting forceps and gauze. The internal mammary vessels are embedded in fibro-fatty tissue and lie about $^{1}/_{4}$ inch lateral to the edge of the sternum. They are picked clean, and a recognisable lymph-gland is often encountered, frequently in the superomedial angle of the space. All tissue removed deep to the internal intercostal muscle should be sectioned and will generally show unsuspected aggregations of lymphoid follicles. Oozing ceases with a temporary dry gauze pack, often within a minute, and definite bleeding can be checked with fine hæmostats. Wounding of the main internal mammary trunks is easy to avoid. A tear of the pleura, if recognised, is of no consequence when the anæsthetist has been forewarned of the possibility. The intercostal space cannot be closed after the exploration, since the intercostal muscles will not hold sutures.

DISCUSSION

The notes of the Middlesex Hospital cancer ward for 1806 record that a woman who died of cancer of the breast had deposits in the internal mammary lymph-glands at necropsy. The passage reads:

> "May 16, 1806. . . a married woman with offspring, aged 86, was admitted with a scirrhous breast and scirrhous gland in the axilla—the former commenced about 2 years ago, the latter a year since.
>
> Oct. 22. Opened. Near to the sternal end of the cartilage of the 2nd rib (internally) there was a scirrhous gland about the size of a small walnut. . . ."

About 1880 it became common knowledge, as shown by inspection of successive editions of *Gray's Anatomy*, that the inner part of the breast drained into the internal mammary glands. Little attention was paid by surgical pathologists to this knowledge, perhaps because surgical exploration of the anterior mediastinum held some risk before the advent of positive-pressure anæsthetic machines made a tear of the pleura hurtful only to the

Thompson (1947) from the Middlesex tuberculosis service—figures used by him to show that the problem of childhood tuberculosis is of no great importance and undoubtedly proving his point in so far as Ealing and Acton are concerned, but fallacious if applied to other areas (table VII). The difference in the number of deaths from tuberculosis in children of school age is particularly striking, and further data from other cities (table VIII) support the view that school-children in Newcastle-on-Tyne have an abnormally large chance of infection.

TABLE VII—DEATHS FROM TUBERCULOSIS (1942–45 INCLUSIVE)

Place	Population	Deaths from tuberculosis			
		All ages	0–5	–15	Total under 15
Ealing and Acton (Thompson 1947)	212,000	450	13	5	18
Newcastle-on-Tyne	270,000	1177	58	72	130

MORTALITY IN SPECIAL GROUPS

It has long been known that the mortality from tuberculosis is much higher in children of families containing an infective adult than it is in the child population as a whole, and the importance of intimate familial contact has been shown repeatedly—e.g., by Cox (1929), by Blacklock (1947), and by my own figures from the tuberculosis contact clinic for children under the age of 5 (Miller 1947).

In Newcastle the number of children under the age of 5 is 18,000, but in 1941–45 one-third of all the tuberculosis deaths below that age occurred in a small group of nearly 400 children belonging to households which contained an adult with notified active pulmonary tuberculosis. Of the 23 deaths in this group with family contact, 9 were in children who were tuberculin-negative when first examined in a "contact" clinic, and if effective separation had then been possible the deaths might have been prevented. *It is evident that the contact clinic, especially for the very young children, could be an important means of reducing deaths and morbidity of tuberculosis if it were supported by some effective method of separating young children from infection.*

The other fact which is generally accepted is that, in children up to 12, the younger the age of infection the greater the risk of a fatal outcome of the primary infection. This has been shown by many authors, and my own small series of figures in Newcastle prove its truth; and yet one is tempted to ask how often this knowledge has been applied.

CONCLUSION

I believe the facts presented here show the importance of tuberculosis as a cause of death in childhood, and emphasise that it must be controlled if as a nation we intend to reduce the death-rates of children. I have in this paper confined my attention to the mortality from tuberculosis in childhood; but I am, of course, only too conscious that other factual knowledge will be needed before the full significance of the disease in childhood can be appreciated. These facts, in England, have never been measured: we do not know the incidence of tuberculin sensitivity at different ages in variou the country or in different social groups; we statistics of morbidity from tuberculosis in ch and notification is certainly "a guide to the ascertainment rather than the incidence of in (Ministry of Health 1946). In Newcastle we are trying to compile information on these points studying the natural history of primary tuberc children in our own community; but we ca under any illusions. The only method of co tuberculosis in childhood is to prevent infection children are infected very largely from adu positive sputa. It is by the control of the adult that, ultimately, we must seek to protect

TABLE VIII—DEATHS FROM TUBERCULOSIS, UNDER 15 YEARS (1945–47 INCLUSIVE)

Place	Population	–1	–5	–15	Total under 15
City of Newcastle	290,000	8	27	44	79
Birmingham.. ..	1,076,000	26	85	57	168
Manchester	659,700	29	57	44	130

SUMMARY

The main purpose of this article is to sh tuberculosis appears so important to the pæ who is attempting to make childhood as free as from infective illness. Secondly, it demonst importance of local study to meet local needs.

1. In England and Wales in 1945 one-sevent deaths of children between 1 and 15 years we tuberculosis.
2. With violence and respiratory disease, tu is responsible for half the deaths between the 1 and 5 years.
3. At school age tuberculosis is the chief cause of death in England and Wales.

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THE INTERNAL MAMMARY LYMPH *IN CARCINOMA OF THE BREA*

STUDY OF 50 CASES

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IT is well known that early cases of carcinom breast—the so-called stage-I cases—show a from recurrence of about 25% within five radical mastectomy. Since stage-I cases are *which the carcinoma is believed not to hav* beyond the breast, this result is inexplicabl the methods of deciding how far the malignan has advanced are less accurate than has been In deciding the extent to which carcinomat breast have extended, surgeons and pathologi concentrated their attention almost entirely one lymphatic exit for carcinoma cells from th of origin—i.e., the axillary lymphatic pathways

We show here that the internal mammary ly pathways are worthy of greater attention t hitherto been paid to them, and that in the least part of the explanation why radical mas in stage-I cases is not followed by 100% cure.

PRESENT INVESTIGATION

To discover how often carcinomatous deposi primary growths in the breast were to be foun

HE EFFECT OF WATER AND SALT INTAKE ON PRICKLY HEAT

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CKLY heat is exceedingly common among white e living in a hot climate, especially if the climate humid. It is usually considered a minor disability. he protracted discomfort it causes may seriously working efficiency and even health.

periments in a hot chamber at the U.S. Naval al Research Institute (Blum et al. 1945) were rned mainly in delimiting the climatic factor in etiology of prickly heat, and no record has been of any other controlled investigation under tropical tions. The experiment reported here was prompted e observation that an increase in intake of sodium ide was followed by severe prickly heat.

octor who had been free from prickly heat on the North n coast travelled to Karachi, India, by air, and at the time began to take extra salt because he felt he was now e in a truly tropical heat. Though the climate was bly no worse than the one to which he had been accus- l, he developed a very severe attack of prickly heat after days.

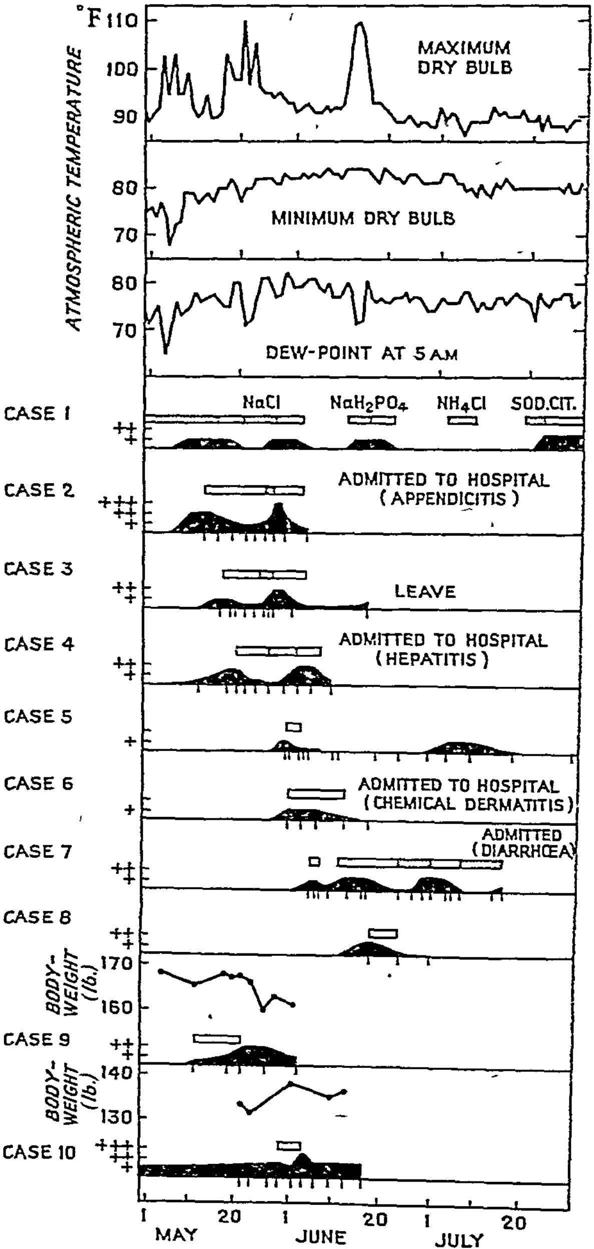
other doctor, whose duties were divided between Karachi, id place, and Cawnpore, a hotter but drier place, found t Cawnpore he was free from prickly heat and had to se his salt intake to avoid hypochloræmia, but that, on ing to Karachi by air, he developed prickly heat, which led only when he ceased taking the extra salt.

eral other similar histories agreed in incriminating lditional intake of sodium chloride as an ætiological in prickly heat, and in the late summer of 1946 al cases of prickly heat were treated by reducing intake and increasing water intake. The prickly of the treated patients improved, and of the ated controls remained stationary; but, since the her also improved at the same time, the result was clusive. In 1947 the investigation was repeated r in the summer, when the climate was, if anything, lily becoming hotter and damper.

METHOD

e subjects of the experiment were 10 members of the of the R.A.F. General Hospital, Karachi, who nued their usual duties during the whole period of nvestigation. They ate the normal staff food, which cooked with liberal additions of salt, but no addi- l daily prophylactic salt ration was taken. During ds of increased water intake the subjects ceased to salt to their food at table and drank 8–12 pints of r daily in addition to their usual fluid intake. king such large quantities of water was difficult, and liuresis inconvenient, but the investigation of 1946 suggested that an additional intake of at least 8 daily was necessary for an effect on prickly heat. inuous supervision of the water-drinking over al weeks was impossible, but coöperation was lly excellent. Selection of cases for the experiment ot influenced by the degree of coöperation expected. ng periods of increased salt intake fluid was reduced e normal habit in this respect and additional table aken. The quantity was not measured, but the salt added liberally to all meals and sometimes to ing-water. It is estimated that 10–15 g. daily was n in this way.

e subjects were examined at irregular but short vals, and on each occasion the severity of the ly heat was assessed. There seems to be no adequate al description of prickly heat, and this matter is too confused for discussion here. The most important features are the subjective sensation of prickling, which may occur even when the skin appears to be normal, and the objective erythema, which is distributed patchily and may be symptomless. Superficial epidermal vesicles are often but not invariably present. An arbitrary grading was adopted which took into account both the objective and subjective aspects, since discomfort in prickly heat may bear little relation to outward appearance. The days on which the men were examined are indicated in the accompanying figure, where severity is shown by the height of the black areas. Fluctuations reported as occurring between examinations are also shown.



Alterations in intensity of prickly heat produced by alterations in intake of water and salt. The intensity of prickly heat is indicated by the height of the black areas and the plus signs. Periods of increased water intake are shown by empty rectangles. The shaded rectangles indicate the periods of increased intake of sodium chloride, except where otherwise indicated (case 1). Weight records are given for cases 9 and 10 (see text). The vertical bars below each base-line indicate the days on which the experimental subject was examined (case 1, being one of the authors, is considered to have been under continuous observation).

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ith an expenses grant from the Medical Research Council.

surgeon's pride. Halsted (1898) wrote of his intention to explore the internal mammary glands in cases of breast cancer but appears to have gone no further. Sampson Handley (1922) explored the anterior mediastinum in 6 cases and found lymph-glands in 2, both of which were invaded. In 1927 he published clinical evidence to show that the internal mammary glands were probably invaded at about the same time as the axilla, and he advocated the routine use of radium in the intercostal spaces as a prophylactic. Scarff and R. S. Handley (1938) suggested that the mortality from recurrence in stage-I cases after radical mastectomy might partly be explained by metastasis via the internal mammary chain, but that there was no microscopical evidence on this point.

The axillary glands have received voluminous attention in published reports and the internal mammary glands (which are a much more awkward problem) almost no mention whatever. Yet it seems clear that a carcinoma, when it is situated in the inner half of the breast, is likely to metastasise to the internal mammary lymphatic chain at the same time as, if not before, it has reached the axilla. When it is in the outer half of the breast, the axilla is likely to be invaded first, but this is followed, without much delay, by internal mammary metastasis, and patients who show extensive axillary deposits can be presumed, with considerable certainty, to have internal mammary deposits. These facts have hitherto neither been recognised nor accorded due weight.

To compare prognosis, results of treatment, and other matters in different series of patients, the system of staging cases of carcinoma of the breast has been widely used. Though at least five different methods of staging are in use, there are, very broadly speaking, three stages: (1) stage I comprises carcinomata still confined to the breast; (2) stage II comprises those which have spread beyond the breast but remain in its vicinity; and (3) stage III comprises those where more distant metastasis has taken place. Staging for scientific purposes is done on a combination of the clinical, histological and X-ray findings, and the point to which greatest attention has been paid is the histology of the axillary glands. The internal mammary lymphatic chain has been ignored. Yet when cancer cells have reached the internal mammary lymphatic chain they are inside the bony cage of the chest, separated from the pleura by only a millimetre or two, and safe from the radical mastectomist. The unfortunate patient showing such invasion harbours a carcinoma which has spread beyond the immediate vicinity of the breast and she must be assigned to stage III. If it is accepted that invasion of the internal mammary chain places a case of carcinoma of the breast in stage III, the effects of intercostal biopsy on the staging of the series of cases reported here is interesting. Without this evidence the cases would have been classified as 19 in stage I, 27 in stage II, and 4 in stage III. In actual fact there were 16 stage-I cases, 14 stage-II cases, and 20 stage-III cases.

Other indications have lately appeared that our knowledge of malignant dissemination has been insufficiently applied to the practical problems of breast cancer. Andreassen and Dahl-Iversen (1949) have shown that their method of "preventive" dissection of the supraclavicular region during radical mastectomies has yielded 17% of microscopically invaded supraclavicular glands. If the axilla has already been invaded, this figure has risen to 33%. If the axilla has not been invaded, the percentage is nil. They have concluded that, if the axilla is invaded, the supraclavicular region should be dissected at the same time as the axilla is cleared. But, if the internal mammary lymphatics are invaded as early as they seem to be, this recommendation of Andreassen and Dahl-Iversen would probably not make much difference to the ultimate result, and it is possible that some of the supraclavicular glands in Andreassen and Dahl-Iversen's cases may have been invaded internal mammary chain.

Saphir and Amromin (1948) examined serial of all the axillary glands from 30 cases of ca of the breast in which previous routine examinatio shown freedom from axillary glandular invasio growth; tumour cells were found in one or more in 10 of these cases ($33^{1}/_{3}\%$). Had the axillary internal mammary glands from our cases been sectioned, the number showing invasion might have been increased by a similar percentage, begins to look as though the number of cases in the growth is in actual fact confined to the b small.

One or two points are difficult to reconcile with importance which should attach to internal m invasion. It is, for example, uncommon to see recurrence at the anteromedial ends of the int spaces. Again, the actual deposits in the anterior tinum are small by comparison with those often in the axilla, and the largest invaded gland obtai the present series through an intercostal space small as a large orange pip. It might also be that primary growths in the inner half of the would be universally recognised as very much fatal than those in the outer half. Though some have found that this is so, others have thought the inner-half growths carried only a slightly prognosis. There is, however, no histological e to suggest that tissue defence against malignant in is more effective in the anterior mediastinum elsewhere, and the internal mammary lymphatic seems to be an adequate highway for the migratio carcinoma cells.

Exploration of the second intercostal space, as have described it, is not to be regarded as a metho treatment for carcinomatous deposits in the int mammary chain but as a reconnaisance designed to fuller information about the movements of the carci cells. The results obtained have indicated a pr in the treatment of carcinoma of the breast for no ready answer suggests itself. The only metho dealing with internal mammary deposits so far pub is Sampson Handley's (1927) technique of impla radium tubes in the medial end of the intercostal and its efficacy has not yet been unequivocally pr

SUMMARY

The state of the internal mammary chain has microscopically investigated in an unselected conse series of 50 cases of carcinoma of the breast.

In 19 cases deposits of carcinoma were found i internal mammary chain, in 3 of which the a glands had not been invaded.

The internal mammary chain is involved at the time as, or before, the axilla is invaded when the pri growth is in the inner half of the breast.

The technique of removing internal mammary ly nodes is described.

Our thanks are due to Mr. W. Sampson Handley D. H. Patey, and Mr. C. J. B. Murray for permissi operate on cases under their care and for their constr criticisms. Part of the expense of this investigatio defrayed by the British Empire Cancer Campaign.

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ıtion of chloride deficiency and the prevention of
y heat.

SUMMARY

·kly heat is relieved by increasing fluid intake and
ing salt intake. It can be made to relapse by
sing the intake of table-salt.

evidence suggests that the sodium ion is the
ive agent in causing prickly heat.

nowledgment is due to the Officer Commanding No. 10
. General Hospital. Karachi, for permission to carry
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owing us to quote from their unpublished work.

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RECURRING PNEUMOCOCCAL MENINGITIS

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ECURRENCES of meningitis seem to be very unusual,
igh they may become commoner now that chemo-
apy has increased the chances of recovery from the
al attack. Most of the few published examples
e been pneumococcal. There are only two recorded
s, both in adults, of pneumococcal meningitis
rring without the presence of fracture or focal
ction (Arbeiter 1943, Craddock 1941). A third
aut 1945) in a child of 7 years may have been the
el of a fractured skull at the age of 4 years. Relapses
rring within a period of weeks are quite common
pelbaum 1945, Hopkins 1944, Craddock 1941,
idge 1940, Smith et al. 1946). In the case reported by
s (1947) a child aged 1 year 11 months recovered
n one attack of *H. influenzæ* meningitis and developed
ther attack eleven months later after an upper
piratory infection.

A case of recurrent meningitis in a woman aged 30
s recently seen at the Postgraduate Medical School
London (personal communication). Antral puncture
l bilateral Caldwell-Luc operations in 1942 were
owed by a foul discharge from the sinuses; in 1943
patient developed streptococcal meningitis and in
16 pneumococcal meningitis; in the third attack,
which she was admitted to Hammersmith Hospital
January, 1948, meningococci were cultured from the
ebrospinal fluid (C.S.F.) No meningococci or strepto-
ci were cultured from throat swabs on any of three
asions; X-ray films of the sinuses gave no definite
ormation: no evidence of cerebrospinal rhinorrhœa
uld be found in spite of a somewhat suggestive history.
covery followed treatment with sulphathiazole and
nicillin.

A boy aged 9 years was admitted to Oldchurch County
ospital (personal communication) in July, 1942,
neteen days after a fall followed by concussion;
ray examination of the skull had shown no bony
jury. He was found to have pneumococcal meningitis
hich responded to sulphapyridine. In March, 1943,
was struck on the left mastoid region by a stone,
d next day developed meningitis; pneumococci were found in the C.S.F. He recovered slowly but completely on treatment with sulphonamides and was still fit and well in 1948. In spite of the negative radiograph it seems likely that this child had had a fractured base of the skull: the relation of injury to the onset of meningitis is notable in both this and the first case described, but its significance as a cause of the recurrences is not obvious.

The response to treatment in the following case raises some important questions.

CASE-RECORD

A boy, aged 4½ years, fell on his head during March, 1945, but did not injure himself severely and did not lose consciousness; 2 days later he developed a headache with vomiting, drowsiness, and delirium, and on admission to hospital showed the classical signs of meningitis. The C.S.F. grew pneumococci type XIV on culture, and pneumococci were cultured from the throat swab. He developed a herpetic rash on the right side of neck and back and a partial 3rd (left) nerve palsy, but after a very stormy interval completely recovered. Treatment from the day of admission consisted of:

'Sulphamezathine' by mouth, 0·5 g. four-hourly for 8 days.
Penicillin intramuscularly, 4000 units four-hourly for 11 days.
Penicillin intrathecally, 8000 units daily for 10 days.
Pneumococcal antiserum intrathecally, on two occasions.

One morning in November, 1946, he was found comatose in bed, and on admission to hospital he had gross signs of meningitis. The C.S.F. yielded a pure growth of pneumococci, which were not typed; pneumococci were also isolated from the throat swab. He recovered completely in 3–4 days after treatment simultaneously with:

[illegible] three-hourly for 10 days.
[illegible] units four-hourly for 10 days.
[illegible] units daily for 10 days.

On the morning of Sept. 2, 1947, when he was aged 7, he fell on his head again, and again apparently did not hurt himself severely. However, at midday he had a severe frontal headache and by 3 P.M. was screaming with pain. He was brought into hospital unconscious and with signs of meningitis. The C.S.F. was under high pressure and looked milky; pneumococci type XXIII were isolated from it; pneumococci were also obtained from the nasopharynx, but were not typed. He was treated with:

[illegible] h, 0·5 g. four-hourly for 17 days.
[illegible] 40,000 units four-hourly for 33 days.
[illegible] rathecally, 40,000 units daily on Sept. 3, 4, and 6.

He rapidly improved and his temperature fell to normal, but on the 9th he relapsed and pneumococci were again present in the C.S.F. Therefore intrathecal injections of penicillin, 20,000 units daily, were given from Sept. 9 until Oct. 3. In spite of this he relapsed several times and pneumococci were grown from several specimens of C.S.F. On Oct. 4, a day after intramuscular and intrathecal penicillin had been stopped, symptoms recurred and pneumococci were found in the C.S.F. He was then given a highly soluble sulphonamide, 'Chemotherapeuticum,' * 1 g. four-hourly for 4 days and then 0·5 g. four-hourly for 7 days. He improved on this drug but again relapsed the day after the dose was reduced to 0·5 g.; a heavy growth of pneumococci was obtained from the C.S.F. on Oct. 11. He was given 10,000 units of penicillin intrathecally on Oct. 12 and 13; on the 13th 200,000 units were given intramuscularly six-hourly, and this was continued for 34 days. He had no further symptoms, and no pus or organisms were found again in the C.S.F. after Oct. 16.

The level of chemotherapeuticum in the C.S.F. was 5·7 mg. per 100 ml. while he was on the higher dose of 1 g. four-hourly, and 4·0 mg. per 100 ml. on 0·5 mg. four-hourly. The pneumococci were found to be fully sensitive to penicillin on several occasions in the course of the disease. The level of the penicillin in the C.S.F. inhibited the Oxford staphylococcus only at a dilution of 1 in 2 or 1 in 4. twenty-four hours after penicillin had been given intrathecally, on several occasions during the early part of treatment. He made an apparently complete recovery and is now normal physically and mentally.

All investigations directed to finding a focus of infection outside the meninges proved negative; numerous radiographs showed no evidence of a fractured skull, infection in mastoids

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* A small quantity of this preparation was supplied by courtesy of Messrs. Roche Products Ltd.

INCIDENCE OF PRICKLY HEAT IN RELATION TO SALT INTAKE *

Salt intake	Palam (Delhi)		Mauripur (Karachi)	
	1946		1947	
Salt in addition to that cooked with food	No. in group	Incidence of prickly heat (%)	No. in group	Incidence of prickly heat (%)
No salt	7	57	..	..
Salt as condiment only ..	43	81	25	36
Salt as condiment, plus 4 g. daily	90	91	30	43
Salt as condiment, plus 8–30 g. daily	132	92	26	100

* Unpublished observations of D. T. Kay.

RESULTS

The initial effect of increasing water intake in persons with prickly heat was sometimes an increase in discomfort, but this passed off in a few hours. After two or three days a definite improvement was usually noted, and in 8 of the 10 persons the prickly heat was eventually much improved or completely relieved (see figure). Sometimes improvement was delayed for as long as ten days, and the impression was gained that the rate of improvement was proportional to the degree of coöperation obtained in drinking the large quantities of water prescribed.

In 5 persons the prickly heat was aggravated or brought on anew when an increased salt intake was substituted for an increased water intake. This deterioration was more rapid and more striking than the earlier improvement on increased fluid. In 2 persons (cases 2 and 3) it was necessary to cut short the second period of increased salt intake because of the excessive discomfort produced. In all 5 cases improvement with a high water intake was demonstrated on a second occasion.

The figure shows that the fluctuations in prickly heat did not always correspond with fluctuations in the environmental conditions. Some cases improved at the same time as others deteriorated. In fact all the investigations except those on cases 1 and 7 were completed during May and June, when the weather was slowly becoming hotter and damper. In spite of the notorious fickleness of prickly heat—its tendency to inexplicable spontaneous remissions and relapses—it seems clear that it was relieved by increasing water intake and aggravated by increasing salt intake.

Prickly heat was not produced de novo in 1946 or 1947 by a short period of very high salt intake—e.g., 100 g. in three days—even though other symptoms developed which could be attributed to salt retention. Once a person had already had prickly heat, smaller quantities of salt seemed to cause a relapse.

One of us (G. O. H., case 1), after twice producing prickly heat in himself with extra salt and relieving it with extra water, took in successive periods sodium dihydrogen phosphate (0·2 gramme-moles), ammonium chloride (0·8 gramme-moles), and sodium citrate (0·4 gramme-moles). Ammonium chloride was not followed by prickly heat, but each sodium salt produced prickly heat. In 1946 ingestion of sodium dihydrogen phosphate was followed by prickly heat in one of us (R. H. M.), who up till then had been free, but an increased water intake did not then relieve the prickly heat. Though the importance of the quantity of water needed was not then appreciated, it is interesting that the attack caused in case 1 by sodium citrate was not relieved by intensive water drinking for ten days.

An increased water intake failed to relieve spontaneous prickly heat in only two cases (9 and 10); in both of these there was a rapid deterioration. These were the
only two cases in which alteration in water
intake was associated with large fluctuations
weight. Observations recorded elsewhere sho
naturally occurring fluctuations in body-weigh
the hot season were greater in the people who d
spontaneous prickly heat than in those w
apparently immune.

OTHER OBSERVATIONS

Fay and Susman (1945), in a naval vessel in
waters, found that the incidence of prickly
60% in those taking a large additional ratio
(18 people), and only 25% in those taking no
or only a moderate amount (28 people).

D. T. Kay (1947, unpublished observations)
several hundred R.A.F. personnel in India fo
heat and inquired into their personal habits, w
environment. There was a higher incidence o
heat among those taking additional salt (see ta
M. L. Floyer (1947, unpublished observations)
at Cawnpore the experiment described here.
additional salt ration of 10 g. daily was sto
water intake increased by 15 pints daily. (In t
drier climate of Cawnpore it was easier to inc
intake than at Karachi.) After a week the seve
heat of the 4 subjects of the experiment had
improved, whereas that of the 3 controls was
or worse. Subsequent observations were di
interpret, because the weather improved and co
in an attempt to restore the prickly heat was in

DISCUSSION

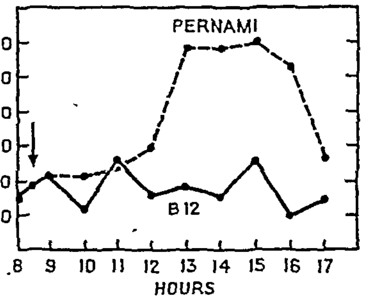
The therapeutic restriction of fluid in prickly
often been advised (Wehrle 1931, Ruge 1932,
1943, Myers 1944, Napier 1946). Raine (1945) st
"it has been established by experiment that t
of sodium chloride bears no relation whatev
incidence of prickly heat" but gave no evidenc
statements do not agree with our observatio
show that prickly heat can be made to relapse b
ing the intake of sodium salts and is usually re
reducing salt intake and increasing water intak
other factors are doubtless concerned, some
will be discussed elsewhere, but clear-cut ev
still wanting for all of them except the climati

The mechanism by which alterations in the m
of water and salt affect prickly heat is obsc
serial experiments in case 1 suggest that the so
is the important agent. The effective quantities
and salt were so large, however, that sodium
may not be the primary ætiological factor. The
tion of McCance et al. (1944), that in human de
the intake of sodium chloride leads to an
urinary excretion of potassium, illustrates th
secondary phenomenon which may have occurr
the experimental periods. On the other hand,
evidence, summarised by Gregersen (1941), w
gests that the skin can store sodium chloride,
less than enough water to dilute it to isotonici
might explain why an increased salt intake sh
in some circumstances as a cutaneous lesion.
heat is commonly assumed to be merely a local
of the skin, but the evidence suggests that,
other cutaneous syndromes, it may also be a m
tion on the surface of some general metabolic dis

The turnover of salt and water in a hot clim
be very large, and may vary considerably fro
day, depending on the environment and on
exertion. Thus short-term alterations in salt a
balances can easily take place and may be re
for the spontaneous fluctuations in prickly heat
referred to. In the absence of a fuller understa
the relative importance of the chloride and sod
it may not be easy to strike a balance betw

narrow into the peripheral blood, but this property st in the most highly purified extracts.

ras now of great interest to ascertain whether the crystalline anti-pernicious-anæmia factor * would iny effect on the leucocyte-count of normal people. ollowing experiment was therefore carried out in erworked nurse, aged 38, who had never been sly ill, and, in particular, had never had hepatitis. hite-cell count was followed for eight hours on two ssive days. On the third day an intramuscular ion of 40 µg. of the pure anti-anæmia factor was at 8 A.M., and the white-cell count was estimated g the first eight hours after injection. On the fourth 0 ml. of a potent liver extract ('Pernami' †) was injected intramuscularly and leucocyte-counts were made as before. The results are plotted in the figure, which shows that the crystalline anti-pernicious-anæmia factor had no effect on the leucocyte-count in this



tions in white-cell counts after intramuscular ction of 12 ml. of liver extract (pernami) and 0 µg of B_{12}.

aal person. One of us (J. D. unpublished) had found er that folic acid in doses of 25 mg. intramuscularly without effect on the leucocyte-count in normal ons.

DISCUSSION

either folic acid nor the crystalline anti-pernicious- mia factor has led to a final solution of the ætiology pathogenesis of pernicious anæmia. Ample evidence accumulated that there must be several factors not only a single substance the lack of which is onsible for all the hæmatological signs of pernicious mia. This is more likely in view of the elegant work arsen (1948), who, by a minute study of the diameter he erythrocytes, showed that in untreated pernicious mia both microcytes and megalocytes were increased, that after liver treatment the blood picture did not rn to normal but closely resembled that found in atitis and other forms of liver damage.

Whether the rise in the white-cell count usually erved in pernicious anæmia after injection of active r preparations is due to the factor found in crude r extracts causing leucocytosis in normal human jects and animals—e.g., sheep—or to the anti- nicious-anæmia factor itself is not yet known. The eriment reported here, clearly shows that the leucoosis factor of Dedichen, fractionated by Laland, is identical with the pure anti-pernicious-anæmia tor or with folic acid.

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We are indebted to Dr. E. Lester Smith and Glaxo Laboratories Ltd. for the sample used in this investigation.

Produced by Nyegaard & Co., 10 ml. of this extract corresponds to 100 g. of fresh liver.

TOTAL SERUM-FAT IN HYPERTONY

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It has previously been established (Harris et al. 1946) that the serum-cholesterol level depends on the capacity of the serum to hold cholesterol; the blood-fat and blood-protein levels are factors determining this capacity.

The present investigation was undertaken to ascertain whether the total fat content of the blood is raised in cases of high blood-pressure. While the investigation was in progress, we found that Wacker and Fahrig (1932) claimed that the blood-lipoid level is raised in hypertony, but their statement was based on only one or two cases. Peters and Man (1943) reported high blood-cholesterol levels in some cases of hypertony of renal origin, but said that in a group of cases of essential hypertony the blood-lipoid level was normal; they did not state the number of cases examined or whether they were established cases of hypertony. Poindexter and Bruger (1938) found a definite increase in cholesterol in arteriosclerotic and hypertonic patients, whereas Page and others (1936) reported that there was no increase in such cases.

It had already been proved conclusively that the increase in cholesterol is broadly proportionate to the increase in systolic pressure (Harris et al. 1946). In 46 outpatients the average age was 59, the average blood-pressure 180 mm. Hg, and the average serum-cholesterol level 216 mg. per 100 ml. In 20 patients whose average age was 60, but who had an average systolic pressure of 250 mm. Hg, the average serum-cholesterol level was 273 mg. per 100 ml. More striking still were the findings in inpatients. In 59 inpatients, whose average age was 55 and whose average systolic pressure was 188 mm. Hg, the average serum-cholesterol level was 208 mg. per 100 ml. In 27 inpatients whose average age was also 55, but whose average systolic blood-pressure was 241 mm. Hg, the serum-cholesterol level was 231 mg. per 100 ml.

INVESTIGATION

Total lipoid, total fat, phosphatide, and total cholesterol were determined in a series of patients with high blood-pressure and in others with normal pressures. The glucose-tolerance test was also applied in many cases.

Total lipoid was determined by Joseph's (1939) method: fatty acids by Bloor's (1943): total cholesterol by Ireland's (1941), as modified by him in our laboratory; and glucose-tolerance by that of Hagedorn and Jensen (1923). These determinations were all done with the patients fasting.

In the cases of high blood-pressure the systolic readings were 200 mm. Hg or more, and in the normal cases 140 mm. Hg or less. The great majority of cases of hypertony were apparently not of renal origin, but the series included a considerable number of patients who apparently had a postmenopausal hypertony.

The results were as follows:

	HIGH BLOOD-PRESSURE			NORMAL BLOOD-PRESSURE		
Substance	*No. of cases*	*Mean (mg. per 100 ml.)*	*Variance*	*No. of cases*	*Mean (mg. per 100 ml.)*	*Variance*
Cholesterol ..	35	268·2	163 3	50	178·2	28·7
Lipoid ..	35	982·6	1476·9	46	696·1	320·4
Fatty acid ..	37	625·8	607·8	21	420·4	629·6
Phosphatide ..	18	227 2	215·1	23	179·7	80·3

or sinuses, or any pulmonary lesion. at any time during 1945–47.

DISCUSSION

It is commonly accepted that meningitis may come about in one of the following ways:

1. (*a*) Direct extension from the nose in olfactory nerve sheath.
   (*b*) Via the lymphatics in purulent sinusitis.
   (*c*) Direct extension through bone.
2. Hæmatogenous spread from a focus in the nasopharynx or elsewhere.
3. Extension from the middle ear.
4. Extension through perforating wounds and fracture of the base of skull.

A possible cause of recurrences of meningitis might be the persistence of a small abscess in the meninges, following the first attack. Such a lesion has been noted at autopsy in a case of pneumococcal meningitis (Smith et al. 1946). This would certainly account for the obstinate tendency to relapse shown in the last attack of the case reported here. An abscess of this type might have formed in the period following the first, and inadequate, course of intrathecal penicillin, which was given for 3 days only; it might explain the failure to obtain a cure later with 24 successive days' treatment with intrathecal penicillin. The long-continued and intensive treatment with intramuscular penicillin may have eventually succeeded because the penicillin penetrated to the loculus through the blood-stream rather than the C.S.F. But such an abscess must be dismissed as a cause of recurrences in any of the cases mentioned, in view of the change in type of the pneumococcus which occurred in the present case and in the published ones; even a different organism was found in each of the three attacks in the Hammersmith case.

It seems necessary therefore to postulate in these cases either an abnormal path of entry for organisms between nasopharynx and meninges, or a periodic lowering of resistance which allows infection of the meninges to take place.

All writers on the subject emphasise the necessity for continuing the treatment long after apparent recovery in any case of pneumococcal meningitis. Appelbaum (1945) notes that the difficulty of treatment is probably due to persisting foci of infection. The case reported here again shows that intrathecal penicillin must be given for considerably longer than 3 days; it also illustrates the uselessness of giving high doses by that route, a procedure which may lead to fits, chemical meningitis, and other effects. The necessity for prolonging treatment is stressed by Smith et al. (1946) but the present case suggests that their dosage of intramuscular penicillin may sometimes be inadequate, a possibility implied in their own paper by the statement that relapses were common. It is likely that the final course of penicillin, solely intramuscular, was successful partly because of its duration but largely because of the high dosage. Bodian and Paterson (1946) have shown that the very low scale of 1000 units per lb. of body-weight per day is sufficient to control most infections, but there is a strong clinical impression that in rare cases many times this amount may be necessary; in the present example the daily dosage was 20,000 units per lb. of body-weight. This increased dosage may be needed when persistence or recurrence of infection is due to foci of infection situated in places, such as the meninges, which penicillin does not easily reach in sufficient concentration. It is reasonable to suppose that in the present case the concentration of penicillin in the blood-stream ultimately became high enough to penetrate to a pocket of infection which had been discharging intermittently into the subarachnoid space and was not accessible to penicillin in the C.S.F. It is, of course, still possible that the child will have a further recurrence.

SUMMARY

A child had three attacks of pneumococcal men at intervals of a year, of which the last attack extremely resistant to treatment.

The variation in the type of organism in th other known examples of recurrent meningitis s that infection enters each time from outside the me probably by extension from the nasopharynx.

The case emphasises the necessity of giving int penicillin for not less than five days in pneum meningitis.

Acknowledgment is due to Dr. B. W. Lacey and Dr. Stocker of Westminster Hospital bacteriology depart their work and helpful criticism; to Dr. Graham Bu his kind permission to quote the history of the case Hammersmith; and to Dr. E. Miles for permission to that from Oldchurch Hospital, and Dr. T. N. Nauth-M the details.

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ANTI-PERNICIOUS-ANÆMIA FACTOR WHITE-CELL COUNT

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EARLY in 1948 Rickes et al. and almost simultan Lester Smith reported the isolation of the crystalline anti-pernicious-anæmia factor (named vi B_{12} by the American workers). The pure substan said to be active in pernicious-anæmia patient amounts of the order of 3–6 μg. Though the p which Laland and Klem described in 1936 was cl active only in doses as relatively large as 0·7 mg. the semi-crystalline and pinkish preparation mad Laland in 1939 in doses of 0·5 mg., astonishingly steps were necessary to achieve the final purification

Clinical trials with the pure substance by West (Spies et al. (1948), and Ungley (1948) showed th was able to restore the blood picture to normal and to combat combined degeneration of the spinal so far as can be judged from the few cases investi regarding this point.

Powers and Murphy (1933) showed that liver ex affected the white-cell count, pronounced leucoc appearing six hours after the injection of potent extract in normal persons. The leucocytosis essentially due to an increase in the neutrophil-c Laland (1939) and Dedichen (1939) showed that the to produce leucocytosis was associated with the anæmia principle through the process of purific up to one of the very last steps. The pinkish subs of Laland mentioned above, which was the preparation obtained before 1945, was devoid of leucocytotic action whatsoever, whereas this actio found in another fraction soluble in phenol-bu (20 : 80). This material (X PbPh) caused a di leucocytosis both in sheep and normal people in of 0·05 mg. (on a dry basis) per kg. of body-weight.

These experiments showed that crude liver ex contain a substance which, in minute quantities, a release of neutrophil polynuclear leucocytes fro

SUMMARY

otal amounts of fat, cholesterol, fatty acid, and
.tide in the serum were found to be significantly
d in patients with high blood-pressure.
ıhydrate metabolism is impaired in hypertony,
ıtein metabolism.

.sh to thank Mr. R. L. Plackett, lecturer in statistics
Jniversity of Liverpool, for working out our data
ılly ; and Prof. H. E. Roaf, M.D., and Prof. Louis
ad, D.SC., F.R.S., for their encouragement.

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ıMAN SERUM CONTAINING ANTI-N AGGLUTININ

PHANSOMBOON M.B. Bangkok
ELIZABETH W. IKIN B.Sc. Lond
A. E. MOURANT M.A., D.Phil., D.M. Oxfd
'iriraj Hospital, Bangkok, and Ministry of Health Blood Group Reference Laboratory, London

ABO, Rh, and MN blood-groups of 213 Siamese
s have recently been determined by us (1949).
liminary tests carried out at Bangkok on some of
ıecimens it was found that the serum of one
.en agglutinated the red cells of another. Further
.gation in London showed that the serum contained
ti-N agglutinin. The specimen reacted better at
temperature than at 37°C, showing at room tem-
re a titre of 8 with N cells but only giving a
ːul reaction when tested undiluted against MN
Reactions were only slightly enhanced by
.ding the cells in bovine albumin.

person in whose serum this antibody was found
ıan of group O, M, R_1R_2 who said he had never
ɜd a transfusion. The antibody is therefore almost
ıly of spontaneous and not immune origin.

have previously noticed that anti-M sera of human
tinct from animal origin have a similar tendency
ct much more weakly with heterozygous than with
:ygous cells. Human anti-N sera are extremely
ınd we know of only six which have previously
described—by Singer (1943); Callender and Race
, who refer to a serum of their own and to an
[illegible] count of one found by the late Dr. G. L.
; [illegible] and Holman (1947); De Kromme and
er Spek (1948); and Gasser and Grumbach (1949).
:e also aware of the existence of one other, not yet
bed (Dick 1946), found in a pregnant woman;
was no evidence in Dick's case that the antibody
ıf immune origin and it did not cause hæmolytic
e in the baby.

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Reviews of Books

Textbook of Ophthalmology

Vol. IV. Sir STEWART DUKE-ELDER, M.D., D.SC. St. And., PH.D. Lond., F.R.C.S., director of research, Institute of Ophthalmology, University of London; ophthalmic surgeon, St. George's Hospital. London: Henry Kimpton. 1949. Pp. 1154. 70*s*.

THE first volume of Duke-Elder came out in 1932, and it was at once apparent that here was something out of the ordinary. The author's ability to arrange a mass of facts into an orderly and interesting tale was acclaimed everywhere, and we all wondered whether the standard would be maintained. That was 18 years ago and vol. IV has just appeared. During those 18 years a periodic masterpiece of medical writing has appeared from the author's hand and the present volume is no exception. Two more volumes are envisaged, and when the whole has been published we shall have a work of erudition and genius hardly paralleled in medical literature. This volume deals with the visual pathways, squint, errors of refraction, and clinical optical appliances. It opens with a warm tribute to Harvey Cushing, and the reader is then taken completely through the neurology of vision, with excellent illustrations from the works of Cushing, Cairns, Jefferson, and others. The remaining sections cover concomitant and non-comitant squint, ocular deviations and nystagmus, optical anomalies of the eye including aniseikonia, eye-strain, and visual hygiene, and lastly optical appliances.

Duke-Elder has become the standard reference book in ophthalmology in all languages, and rightly so. The present volume is as good as we expected it to be, and that is saying a great deal.

Sensory Integration

E. D. ADRIAN, O.M., M.D., F.R.C.P., F.R.S., professor of physiology in the University of Cambridge. Liverpool: University Press of Liverpool. 1949. Pp. 20. 1*s*.

MOST of Sherrington's work on which was based his book *The Integrative Action of the Nervous System* was done during his tenure of the Holt chair of physiology at Liverpool, and on the occasion of his ninetieth birthday the University of Liverpool instituted in his honour a Sherrington lectureship. The first lecture of the series is now published. In it Professor Adrian explains the rationale of Sherrington's study of the nervous system, and finds in the general principles he revealed the reason for his pre-eminence. So far as actual detail is concerned, technical advances in pharmacology, electrical recording, and the manipulation of nervous tissues have yielded a rich harvest of knowledge about the way the nervous system works, but much of it has little immediate bearing on the problem of integrated behaviour. In the field of sensory physiology, however, the new techniques can be applied to the study of the whole organism, and Professor Adrian goes on to discuss the implications of the discoveries he and others have made about the sensory patterns, in the form of nerve impulses, which pass from the periphery and have been shown to be reproduced in the cerebral cortex. However far we may be from understanding the connexion between brain and thought, the physical aspects of cortical activity are steadily being unfolded.

Geriatric Medicine

The Care of the Ageing and Aged. (2nd ed.) Editor: E. J. STIEGLITZ, M.D. Philadelphia and London: W. B. Saunders. 1949. Pp. 773. 60*s*.

THIS book, whose first edition appeared in 1943, is a departure from the past tradition of monographs on geriatrics. Nascher, Thewlis, Boas, Mueller-Deham, and Rabson all wrote with the personal experience of long years among elderly patients. Stieglitz has collected a team of 46 specialists whose contributions are bound together by the chapters which he himself writes. As might be expected, the geriatric inclination varies from writer to writer. The references are almost entirely American and little notice is taken of workers who happen to live in Europe. In consequence, certain chapters are lacking in orientation towards the problems

The differences between the means of the hypertonic and the normal groups were as follows :

Substance	*Difference*	*Standard error*	*Ratio*
Cholesterol	90·0	13·8	—
Lipoid	286·5	42·4	—
Fatty acid	205·4	35·2	—
Phosphatide	47·5	17·2	2·8

It will be seen that the differences for cholesterol, lipoid, and fatty acid are highly significant—i.e., there is little doubt that these substances are increased in cases of high blood-pressure. The difference for phosphatide is less marked ; but it seems likely that here also the amount is increased with high blood-pressure.

Age and Total Fat.—Blix (1926) has found that the serum-fat level does not increase with age though arteriosclerotic patches are more frequent in the higher age-groups. Our findings tend to support this finding. Tables I and II show that there is a definite relationship of total fat and cholesterol to hypertony, and not so much to the different age-groups.

TABLE I—SERUM-LIPOID LEVELS IN PATIENTS WITH HYPERTONY * AND IN CONTROLS † (NUMERALS IN PARENTHESES)

Total lipoid (mg. per 100 ml.)	Age-group (years)							Total	
	10–19	20–29	30–39	40–49	50–59	60–69	70–79	Hypertony	Controls
400	..	..	(1)	..	..	..	..	..	(1)
500	(3)	(2)	(1)	(2)	..	(1)	..	..	(9)
600	(2)	(4)	(3)	..	1	..	..	1	(9)
700	(5)	(3)	(4)	1 (1)	3	1	..	5	(13)
800	(1)	(3)	1 (3)	..	2 (4)	..	1	4	(11)
900	..	..	..	..	4	1	1	9	..
1000	..	..	..	1	3	1	1	5	..
1100	..	..	..	1	..	3	..	4	..
1200	..	..	..	..	1	..	..	1	..
1400	..	..	..	..	..	1	..	1	..
1500	..	..	..	..	..	..	1	1	..
1600	..	..	..	..	..	1	..	1	..
Total cases	(11)	(12)	1 (12)	3 (3)	14 (4)	11 (1)	4	32	(43)
Mean level	.. (686)	.. (708)	850 (708)	983 (617)	914 (850)	1105 (550)	1100 ..	938 ..	.. (706)

* Blood-pressure 200 mm. Hg or more.
† Blood-pressure 140 mm. Hg or less.

Effect of High-fat Diet on Serum-cholesterol.—A high-fat low-carbohydrate diet raises the serum-cholesterol level. A high-fat diet was given for about three weeks, and after an interval of three days the patients were kept on a low-fat high-carbohydrate diet for about three weeks. In some cases we gave first a high-carbohydrate low-fat diet, followed by three weeks of high-fat low-carbohydrate diet. The averages of four serum-cholesterol levels read in the last eight days of the period were as follows :

Case no.	*Serum-cholesterol levels (mg. per 100 ml.)* *High-fat diet*	*Low-fat diet*
1	120	91
2	106	91
3	250	182
4	147	92
5	263	189
6	210	187

In cases 5 and 6 the low-fat diet was given for the first period and the high-fat diet for the second period.

Plotz (1949) suggests that a high-fat diet predisposes to coronary occlusion in patients who previously had had coronary disease. We should also like to draw attention to the fact that the way to lower the blood-cholesterol level is to lower the fat intake.

Effect of Insulin on Cholesterol and Fat.—Blood was taken from fasting patients before and at various times after the injection of insulin. It will be seen from table III that in each case the serum-fat serum-cholesterol levels fell.

TABLE II—SERUM-CHOLESTEROL LEVELS IN PATIENT HYPERTONY * AND IN CONTROLS † (. PARENTHESES)

Total cholesterol (mg. per 100 ml.)	Age-group (years)							T
	10–19	20–29	30–39	40–49	50–59	60–69	70–79	Hyper tony
100	(3)	(5)	(4)	(1)	..	..	..	.
150	(6)	(3)	(4)	1 (3)	2 (4)	2	..	5
200	(3)	(4)	1 (4)	1	6 (2)	2	2	12
250	..	..	(1)	1	..	1 (1)	1	3
300	..	..	..	1	2	2	(1)	5
350	..	..	..	1	2	1	..	4
400	..	..	..	..	..	1	..	1
450	..	..	..	..	..	1	..	1
Total cases	(12)	(12)	1 (13)	5 (4)	12 (6)	10 (1)	3 (1)	31
Mean level	.. (175)	.. (171)	225 (183)	275 (163)	258 (192)	300 (278)	242 (325)	272 ..

* Blood-pressure 200 mm. Hg or more.
† Blood-pressure 140 mm. Hg or less.

Glucose-tolerance Tests.—Of 32 cases of high pressure, 23 showed abnormal curves—either the was higher than 170 mg. or the curve did not re normal fasting level within two hours. Three were on the borderline of abnormality, and only 6 gave a normal curve. Diabetes is a well-rec complication of high blood-pressure, but in all cases no sugar was found in the urine. Of 9 pe with normal blood-pressure whose glucose-tolerance tested, all gave normal curves.

COMMENTS

We have previously established (Harris et al. 1 that in cases of high blood-pressure there is a d retention of nitrogen ; but at that time we could no explanation for this observation.

The fact that carbohydrate as well as protein bolism is apparently abnormal in hypertony su that the anterior lobe of the pituitary gland, and merely the pancreas, is concerned in the abn glucose reaction. Overaction of the anterior lobe rise usually to symptoms which strikingly resemble of high blood-pressure—polyuria, decrease in tolerance, &c.—and it may ultimately be found endocrine disorders, particularly those affecting anterior lobe of the pituitary, may be one of causal factors, or the causal factor, in essential blood-pressure.

It is also known that the central nervous syste concerned with endocrine functions. It is inte that the frightening of cats (Lyons 1931) causes serum-cholesterol level to rise—an effect which ca abolished by sympathectomy.

TABLE III—EFFECT OF INSULIN ON SERUM-LIPOID

Blood taken with patient fasting before injection and at v intervals after injection, still fasting

Case no.	Time (hr.)	Insulin (units)	Serum levels (mg. per 100 ml.)			Sug (mg 100
			Lipoid	Cholesterol	Phosphatide	
7	0	20	1385	231	355	1
	2		1320	223	350	
8	0	20	1410	284	360	1
	2		1200	255	365	
9	0	20	785	164	..	1
	2		740	142	..	
10	0	15	775	164	..	<
	2		700	162	..	
11	0	15	1255	225	..	<1
	4		1015	201	..	

* By method of Folin and Wu.

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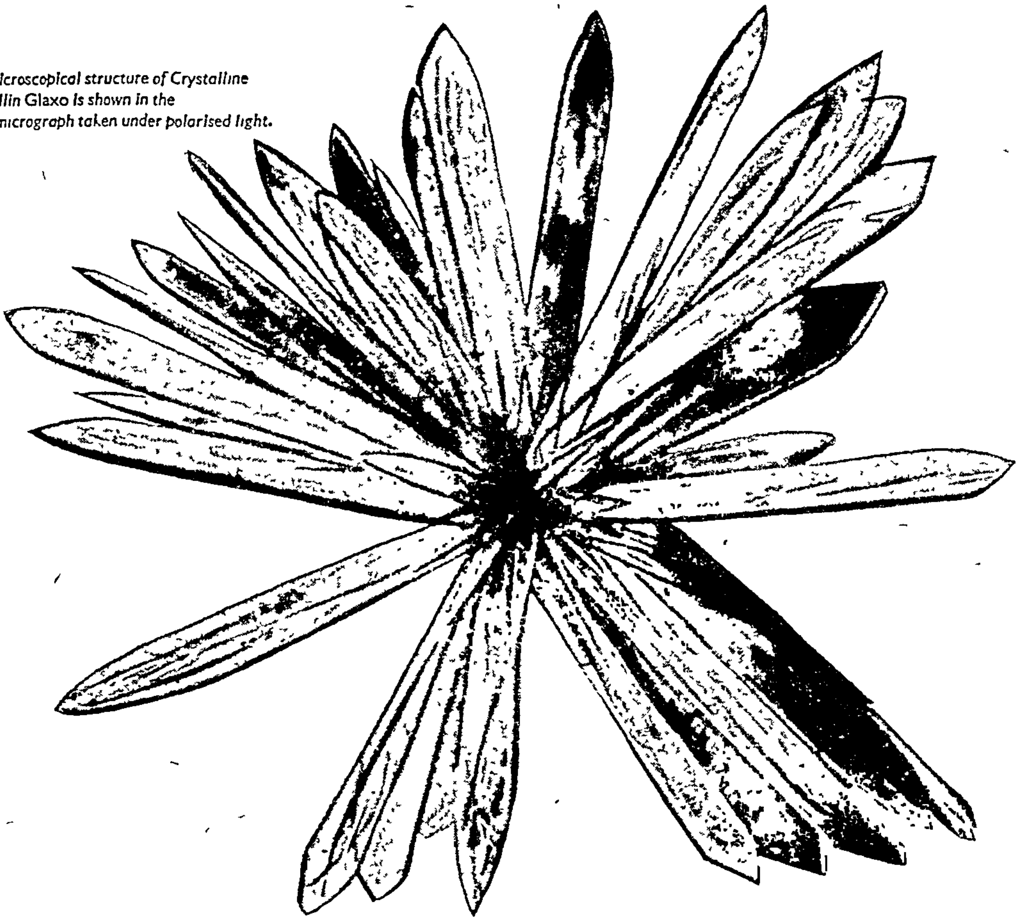
hotomicrograph taken under polarised light.



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of the elderly. For example, the management of a hemiplegic patient is dismissed in 28 words: occupational therapy only receives one short paragraph: and there is no specific mention of the problem of cor pulmonale.

Yet much of this book is above criticism. The first seven chapters contain an exposition of the basic foundations of geriatrics and gerontology which is unequalled. Everything that Stieglitz writes is profound, thoughtful, and stimulating. The chapter on coronary-artery syndromes presents several novel and interesting ideas. Other sections are competent summaries of existing knowledge in this field of medicine. The book contains a great deal of information which will be of the utmost value to those who have to diagnose and treat the diseases of elderly patients. It is well produced and clearly illustrated. If there had been reference to the progress made by workers like Himsworth, McMichael, Warren, Howell, and Cosin, it would be unquestionably the best book ever written on old age.

Methods of Psychology

Editor: T. G. ANDREWS. London: Chapman & Hall. 1948. Pp. 716. 30*s*.

IT is impossible to examine this collection without realising that psychology has ceased to be an arena for contending schools, and is now a serious science equipped with methods ingeniously appropriate to its varied subject matter. In his foreword Professor Andrews makes the salutary point that the facts and principles of psychology are always to be interpreted in terms of the methods used: though this is true of every science, it is particularly necessary to recall it in psychology, and to describe the diverse techniques and tricks by which investigators have brought into their subject exactness and order. The book is divided into twenty-two chapters, each written by an authority: E. G. Wever, for example, deals with the study of hearing, S. H. Bartley with vision, and P. T. Young with motivation, feeling, and emotion, while L. L. Thurstone returns to the methods of psychophysics, "a discipline which is fundamental to the problem of measurement in psychology"; he remarks further that the psychophysical methods transcend the older fields to which they have been applied and have become powerful tools in the solution of important problems in political and social behaviour. Statistical methods are the only ones omitted from this book: the reason is that, unlike the methods described here, they are fully dealt with in many textbooks. Although intended for students of psychology, the book has few chapters that are not of direct interest to the medical reader. The psychiatrist will turn chiefly to Saul Rosenzweig's section on the appraisal of personality, Joseph Zubin's on the objective study of disordered persons, Andrew Brown's on clinical techniques, and Helen Koch's on the study of young children; he will also find Theodore Newcomb's chapter on studying social behaviour profitable. Many of the chapters seem at first reading insufficiently detailed regarding the methods described: the book is not meant, however, for research-workers but for undergraduates, and every chapter has a bibliography reinforced by suggestions for further reading. As an authoritative review of a vast toolshop, describing lucidly the use of the various tools for the study of mental function, this is a most valuable compendium.

Lehrbuch der Embryologie

WALTER BRANDT, M.D., PH.D., lecturer in anatomy, medical school, Birmingham; formerly professor of anatomy, University of Cologne. Basle: Karger. 1949. Pp. 648. Sw. fr. 56.

THIS new German book on human embryology, which is clearly influenced by the work of Wolf-Heidegger, Kollmann, and Töndury, pays particular attention to experimental embryology. More than the first quarter of the book is devoted to general embryology, containing such features as a description of vertebrate gastrulation, the menstrual cycle and its endocrine control, and tests for pregnancy (the xenopus and ovarian hyperæmia tests, however, being omitted). The remainder of the book is concerned with systematic human embryology, the account of each system being preceded by a description of its developmental physiology. But, approximately a sixth of the book is occupied developmental physiology and experimental emb it is surprising to find no reference to the works of Reynolds, or Windle, or Barcroft's *Researches on P Life*. The emphasis on experimental embryology perhaps, overshadowed the sections on sys embryology, and there are occasional inaccuracies omissions in the latter. Thus the "crista div is described as the upper edge of the eustachian the circumvallate papillæ are reported as being the sulcus terminalis of the tongue, and no acc made of Van Dyke's and Klapper's recent work on fate of the ultimobranchial body. On the other the description of the development of the digestive is lucid and comprehensive. Improvements might made by mentioning the importance of the cortex in the ætiology of pseudohermaphroditism, describing the menstrual cycle *before* mentioning effect of the corpus luteum and progesterone on the metrium, and by adding a more detailed list of references given at the end of the book. This text of embryology, while emphasising the important tributions made to earlier embryology in Germany the application of the study of embryology to obst also embraces the progress made in America, as as in Europe, in the last twenty years, and for reason it will be particularly welcome on the Conti

Specs

BM/TTCE. Mem. Inst. P.R., F.A.D.O., Reg. Med St. Albans: W. Cartmel. 1949. Pp. 49. 3*s*. 6*d*.

THIS small booklet, which can be read from co to cover within the hour, gives all the essential d of spectacles. The general form of the book and chatty style make it easy to read, and it can be st recommended to all who wish for further informa about the kind of glasses they should wear or ab the glasses they are actually wearing. The author, prefers to remain anonymous, has for some years man a busy medical sight-testing centre and has acqu a sound knowledge of the sort of questions that peo wish answered. All the answers will be found in book.

Nelson's Loose-leaf Surgery: *Renewal Pages* (York: Nelson & Sons. 1949).—The latest renewal pages for book are concerned with burns, pigmented naevi and m mata, the lymphatics, vagotomy as a treatment for p ulcer, the rectum and anus, liver-function tests, the t urethral operation for prostatectomy, the operation of cystectomy, and the treatment of sterility, to which is ac an index. All these contributions bring the subjects up date, reach the high general standard to which we have accustomed, and will be welcomed by all who posses th useful work.

The Magistrate's Courts (Harmondsworth: Pelica Books. 1949. Pp. 222. 1*s*. 6*d*.).—Both for the layman wh shares the view that magistrates' courts are the place wh "they do the drunks," and for the magistrate himself, t book by Mr. F. T. Giles should be invaluable. Some membe of the bench have read Stone: others, who possess poo staying-power, would be well advised to read Mr. Gi The doctor, both as citizen and potential witness, can lea much from him: he contrives to be informative and entert ing. This is one of the Pelicans which many people w like to have bound in a less expendable form.

A Surgeon's World (London: Robert Hale. 19 Pp. 353. 12*s*. 6*d*.).—This book, by Prof. Max Thor is one of the now familiar success stories of Europ immigrants who have made outstanding medical careers i themselves in the United States. Like other works in t *genre* it combines the sentimental style of best-selling Ameri fiction with the inside life-and-death stories beloved of t general public; and, like them, it fails to tell us what be a surgeon is really like. It falls far short, for instance, of t great biography by Loyal Davis of a great predecessor Dr. Thorek's in Chicago, J. B. Murphy. We do, howev gain a vivid impression of the jungle of Chicago life in t early years of the century, and the author's thought concern for his juniors is clearly demonstrated.

THE LANCET

ONDON: SATURDAY, AUGUST 13, 1949

Counting our Blessings

ı the melancholy induced by recurrent dollar
and wet Bank Holidays, perhaps the contem-
n of death certificates is hardly the appropriate
iption: yet the Registrar-General's Review of
x years 1940–45 [1] contains much to interest and
en us. Certainly we can draw comfort from this
icle of the trends in the national mortality-rates
the critical war years; for at least some of the
icial effects of a war-time economy may still
from our peace-time austerity. The trans-
tic thirst for our best native brew may have
ved us of its solace, but the death-rates from
olism and cirrhosis of the liver have fallen
tly since early in the war. There has been,
a curious change in the age-sex specific death-
from degenerative heart-disease—a condition
ally attributed to excessive stress and strain.
een the wars the death-rate from this cause
rapidly increased; but during the late war
trend slowed down among younger men and
actually reversed among men of 65 and older,
among women of all ages—but particularly
een 35 and 50—there was a dramatic fall. No
convincing explanation can be given, but it is
nably supposed that the state of full employ-
, with the consequent relief from economic
eties, combined with the levelling effect of
ning on both undernutrition and overindulgence
minish cardiac strain. Again in diabetes mellitus,
ning may have had a beneficial effect. The
ial rations allowed to diabetics permitted a shrewd
nate of their number to be made on the basis of
claims reaching the Ministry of Food, and from
e it was deduced that some 4% of diabetic patients
from the disease during a year. But there were
ficant differences of specific age and sex groups.
oth sexes the mortality-rate notably diminished:
men it was 28%, and for women as a whole
, less than before the war. For young women
een the ages of 18 and 34, however, there was a
e increase in the diabetes death-rate during
-43 and a complete absence of any later improve-
t over the pre-war figure. Between the wars, it
ggested, young women were addicted to 'slim-
g" by taking inadequate meals—a cult which
t up their tuberculosis death-rate and diminished
r mortality from diabetes. Now, with better pay
canteen feeding, their diabetes death-rate has
eased, while at the same time, and presumably
the same reason, their mortality from anæmia
tuberculosis has decreased. Economic factors
lisease, it seems, cannot be ignored. Depression
ninating in suicide was at a peak during the
rs of economic hardship of 1931–35, and the
sequent fall in the frequency of suicide seems to
e accelerated in both sexes during the war. As
the Registrar-General suggests, a little cryptically, "fuller employment conduces to lower suicide frequency, even in groups whose work has become so hard as to cause continual complaint."

This seeming preoccupation with social factors should not be allowed to obscure the results of therapeutic innovation and sound preventive medicine, which are seen most strikingly among women and children. Maternal mortality continued to fall throughout the war, largely as the continuing result of the introduction of penicillin and the sulphonamides, blood-transfusion services, and better antenatal and postnatal care. The results of the antidiphtheria immunisation campaign are evident in the greatly reduced death-rate from this cause and in the much lower case-fatality rate among children thus protected, to which Sir **Wilson Jameson** draws attention in his 1947 report reviewed on p. 298. The diseases of infancy and childhood exacted a continuously decreasing toll, so that the death-rates among girls between 5 and 14, for example, fell by about 40% within a period of ten years, while the proportion of girl infants reaching their 5th birthday rose from 85% in 1910–12 to 95% in 1945.

Like previous ones, this Statistical Review is challenging because it raises at least as many questions as it answers. A survey of regional differences in mortality from exophthalmic goitre shows the existence of unexplained divergences in the death-rates in the country as opposed to the town: for example, the rates were higher in coastal areas than inland, and on the west coast and in Wales than in the rest of the country. During the past ten years, too, there has appeared a large and increasing male excess death-rate from leukæmia, and in neither leukæmia nor in the rapidly increasing death-rate from cancer of the lung do improvements in diagnosis provide a satisfactory explanation. In the regional differences in mortality—e.g., among infants in the first year of life and in respiratory tuberculosis—cause and effect may be more easily related, and some levelling of social or environmental conditions and perhaps of medical care is clearly indicated. Ominous signs of faulty hygiene, such as the present death-rate from diarrhœa and enteritis, must also be recognised; for the aim of this and succeeding Reviews will be served only "when the national conscience has at last been aroused by the persistent presentation of unpleasant statistical facts."

Prognosis in Disseminated Sclerosis

Disseminated sclerosis is a common disease in the British Isles; and yet there is little reliable information on its prognosis. Two valuable studies have recently been made in Scandinavia, by **Thygesen** [1] in Copenhagen and by **Müller** [2] in Stockholm, using different methods of case selection and follow-up.

Thygesen has taken all cases of disseminated sclerosis and acute disseminated encephalomyelitis admitted to the two largest neurological clinics in Copenhagen within a year of the onset of symptoms, and has re-examined them eight to fifteen years after their first admission; he has, however, excluded a previous retrobulbar neuritis as an initial symptom of the disease. His criteria for the diagnosis of

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[1] egistrar-General's Statistical Review for 1940–45. H.M. Stationery Office. Pp. 388. 6s. 6d.

1. Thygesen, P. *Arch. Neurol. Psychiat.* 1949, 61, 339.
2. Müller, R. *Acta med. scand.* 1949, 133, suppl. 222.

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in the English language. In this country have, perhaps characteristically. been content ass our National Health Service Act without ing to inquire into such abstract matters.

om Boston, however. has lately come a small ne,[1] containing contributions by eight members e medical staff of the Massachusetts General ital and of the Harvard Medical School, which apts to grapple with some of the issues in terms ligible to the lay public: and the first essay. e development of the hospital. by Dr. EDWARD D. CHILL, is a thoughtful survey of the history of itals. Opening with a quotation from PLATO:

> hen must we not maintain that Asclepius . . . would attempt to protract a miserable existence by a ed regimen . . . thinking medical treatment ill wed on one who could not live in his regular round uties . . ."

CHURCHILL sharply comments that no hospital existed with the simple and logical mission ribed by PLATO: "Sickness is a matter of alarm, of logic." He writes with a mind wide awake he challenge now presented by the utilitarian roach. "It is of more than passing interest." writes, "to learn that in England. where the war need for industrial production is urgent and our is in short supply, a logical concept of the pital function in industry has appeared in a few ters such as Birmingham," whereas in America far neither management nor labour has grasped full utilitarian potential of the hospital as an uvant to keeping the wheels turning in the ustrial assembly line." Passing from a survey he hospital as an expression of the Christian virtues the relationship of the hospital and the medical fession. he writes:

> "This blending of the interest of the doctor with he function of the hospital led to a sense of responsiility and ownership. . . . Society. in turn. has been nly too ready to relinquish some of its responsibility nd relax its efforts. The doctors are supposed o know what they are doing, and comfort is taken in he attitude that it is impossible for a mere layman o judge of such matters."

his situation." comments Dr. CHURCHILL

> 'has created a disturbing undercurrent of thought hat only a few observers appear to notice. Is it well for society. or in the long run. for the profession that this trend continue? Can a not disinterested profession be entrusted with an agency of society that is becoming more vital today than ever before in history? However sincere the efforts of the doctor to provide the best of care for his patients. the fact must be faced that these same efforts provide him with the prestige and comfortable living which he claims. It is possible that the profession is unconsciously drifting into a dangerous position not wholly unlike that in which the Church found itself before the Reformation. If one listens carefully. a faint ringing of bells can be heard when some miracle of medical science is recorded in solemn protocol: salvation in this world can be achieved only if you 'consult your doctor.' and the pain and anguish of the fires of hell will overtake the ignorant or wilful who fail to heed this admonition. The quest for individual survival in this world is fully as intense as the older hope for personal immortality in the next."

It is difficult, he recognises. to place the hospital gainst the background of social and economic history without risking false interpretations and conclusions: but if the forms taken by the hospital in the course of history are left standing only against the background formed by changing modes of expression of the Christian virtues and the progress of medical science, the impression created is unrealistic and incomplete. From such a setting Dr. CHURCHILL approaches the voluntary hospital of the eighteenth century in England:

> "It was not an outgrowth of experience with the great social and economic changes that were brought by the machine age. but a pre-formed pattern that has struggled valiantly during the nineteenth and nearly half the twentieth century to meet needs and cope with problems that were unknown at the time of its origin. With all its shortcomings and inadequacies. it has performed a mighty service by maintaining standards of ethical purpose and humanitarian ideals during a period of changing values. The blending of these attributes with the scientific medicine that developed so swiftly in the last half of the nineteenth century has established the pattern of Anglo-American medicine for the present century."

Reflection on what might have happened points a moral for our own day:

> "As a contrast it is of interest to consider what the course of medicine might have been if set by the government of England at this time. During the eighteenth century in England the government went on adding statute after statute to the "bloody code" of English law. enlarging perpetually the long list of offences punishable by death; finally they numbered two hundred.' This was the period of iron discipline and cruelty in the Royal Navy and the Army. Any form of the hospital cast in the mold of the state of that century might well have blighted the growth of the medicine that was to come. or warped it with the impersonal and arrogant qualities that were recognizable in the medicine of Germany. But the hospital in England was formed by society acting independently of the state and it was this pattern that was transferred to the Colonies that have become the United States."

When he comes to deal with the hospitals in contemporary society. Dr. CHURCHILL wisely refrains from dogmatism. He is refreshingly free from the bias which to many of us in Britain today seems to characterise most American reflection upon the great social experiment now in progress here. His treatment of the subject becomes hesitant and thoughtful: and well it may. After noting that "those responsible for the future of our social institutions are searching for frames of reference that distinguish essential functions from what may be organizational fetishes" he returns again to the temptation to regard the hospital solely as a utility. The care of the sick in hospitals is a far more complicated matter than providing utilitarian technical service.

> "The hospital is one of the most complex and dynamic instruments of contemporary society. It is an interface where the logical concepts of science have made contact with those powerful nonlogical actions of man that center in his survival and release from the fear of suffering."

It is tempting to go on quoting, but this is perhaps enough to show the quality of Dr. CHURCHILL's essay. Dr. NATHANIEL W. FAXON, who has edited the volume and written a final and useful summary of the present situation in the United States. is to be congratulated on his achievement in bringing together a group of men able to think seriously about issues that have been strangely neglected.

The Hospital in Contemporary Life. Eight essays by members of the staff of the Massachusetts General Hospital. Editor: NATHANIEL W. FAXON, M.D. London: Oxford University Press. 1949. Pp. 288. 27s. 6d.

disseminated sclerosis were: (1) neurological symptoms, especially those referable to the pyramidal tracts, in a patient in whom retrobulbar neuritis had previously occurred or was simultaneously present;. (2) remitting symptoms due to lesions of the pyramidal tracts, including tracts mediating sphincter control, when no other cause could be found; (3) remitting paræsthesiæ when no other cause could be found; (4) symptoms referable to the pyramidal tracts, regardless of earlier symptoms of retrobulbar neuritis or the remitting or non-remitting character of the symptoms, when no other cause could be found; and (5) monosymptomatic forms which could be shown not to be due to syphilis or arteriosclerosis and were not associated with notable changes in the cerebrospinal fluid. He admits that the exact status of acute disseminated encephalomyelitis is uncertain, but this diagnosis was made in cases where there was an immediately preceding infection, pyrexia, an acute onset with rapid progress of symptoms, or prominent encephalitic symptoms. Initially there were 84 cases of disseminated sclerosis, 29 of acute disseminated encephalomyelitis, and 31 in which disseminated sclerosis was tentatively diagnosed. At the follow-up it was found that 5 of the cases of acute disseminated encephalomyelitis had died (4 within a year of the acute illness), 13 remained free of neurological symptoms, 7 had developed into typical disseminated sclerosis, and 4 were later considered to have encephalitis lethargica. Of the 31 cases with a tentative diagnosis, 19 were later considered to be suffering from disseminated sclerosis. This elimination of cases left 110 with a firm diagnosis of disseminated sclerosis for consideration. Within fifteen years of the onset of symptoms a third of these patients had died. A quarter of the cases had run a benign course, 13% of them being completely or practically free of symptoms after eight to fifteen years, while in 12% there had been long remissions or the disease had *become stationary at an early age so that the patients* were able to work at the time of the follow-up examination. The remainder of the patients were moderately or severely disabled. Some information on the ultimate prognosis could be deduced from the course of the disease in the first year or two. In general the disease ran a relatively benign course when the onset had been acute or subacute and when there had been a total or partial remission during the first year: in practically all the cases with an insidious onset and steady progression during the first year the subsequent course was unfavourable. Changes in the cerebrospinal fluid were of no value in assessing the prognosis. On the whole, the course of the disease was more benign in the higher age-groups.

Müller has studied a considerably larger series of 810 patients, in whom the diagnostic criteria seem to have been strict. The case material was obtained in a different way; patients in whom the diagnosis was made in two hospitals in Stockholm and one in Uppsala during 1920–45 were re-examined in 1946, or when the patients had died the relatives were interviewed. Of these 810 patients, 63% had a history of more than ten years from the onset and 22% of more than twenty years. At the time of the follow-up 190 patients (23·5%) had died, the great majority of urinary or respiratory infections or toxæmia from bed-sores; in 19 cases the cause of death appears to have been unrelated to the neurological di 6% of the patients had died within five years initial symptoms and 34% within twenty Two-thirds of the patients in whom the obse period was at least fifteen years had become in within this period. **Müller** found that whe initial symptoms were cranial-nerve or sensory turbances the outlook for remissions and a rel benign course was decidedly better than disturbances of motility or of sphincter occurred early. On their first appearance nerve and sensory disturbances cleared up in quarters of the cases, motor disturbances in a and sphincter disorders in only an eighth. W the initial symptom, if it persisted for six mo complete remission was unlikely. When disse sclerosis first appeared in older age-groups a progressive course without notable remissions much more probable than the remitting type of disease common in younger people.

These studies give a valuable general pic the natural history of disseminated sclerosis; but prognosis in an individual patient remains rem difficult. The most that can be said is that c rapid onset, patients with initial cranial-nerve sensory disturbances, and those in the y age-groups are likely to have remissions of the When the disease has a slowly progressive which is the commoner type in the older remissions are unlikely. In the early stages important not to take too gloomy a view, since 25% of **Thygesen**'s patients there was rela little disability eight to fifteen years after the of symptoms, excluding retrobulbar neuritis is a general impression that pregnancy and partu may precipitate relapses of disseminated sclerosis aggravate existing symptoms, but in his mat **Muller** found no evidence to support this idea.

Towards a Philosophy of the Hospital

What one might call the philosophy of h provision has been taken very much for gr The hospital in history has been unaccoun neglected by social historians, and medical his have too often been content with a few brief refe to the hospitals of antiquity and of m Christendom. But now that planning—and p to a large extent from the centre—has become but a necessity, it no longer suffices to go on in matter-of-fact way. A sense of background and idea of the direction in which we are movi indispensable. It may well come as something a shock to realise that three different ideas of purpose of a hospital are current, and that the signposts point to paths that are far from conv on the same destination. The first, and still do idea, is that the hospital exists for the relief of suff the second is that the hospital exists to assist doctor in the preservation, or maybe prolonga of human life; and the third, which is gaining today, is that the hospital exists for the good of community, understood in a sense that would of cuts in the hospital services if it could be shown resources of man-power or money could be " profitably " used in preventive medicine. The large and difficult questions with an obvious pra bearing; yet we know of no reasoned discuss r to that of streptomycin. Clinical trials with it een made by continental workers. According to rps and Kalkoff[6] it produced clinical improve in 80% of patients with lupus vulgaris. Equally aging are the reports of its effect in intestinal ulosis and tuberculosis of bladder and of bone.[7] 98 is apparently effective in early exudative cases monary tuberculosis,[8] but not in miliary tuber ; or tuberculous meningitis. The drug appears to newhat toxic. since it may cause vomiting, albu ia, jaundice, and cerebral œdema. These reports be accepted with reserve, for the investigations have een submitted to such rigid statistical control as cent M.R.C. trials with streptomycin.[9] Evaluation accumulation of individual clinical experiences variety of types of tuberculosis takes a considerable and the conclusions, being based on clinical ssion, are far less reliable than those formed by a of investigators whose individual reports are sed by an experienced medical statistician.

A RACKET IN NURSING

E opinions expressed in our leading article of 30 on the Dangers of Uniformity had no reference e Ministry of Health's circular, dated July 27. dding the engagement of nurses at more than the lard rates.[10] In this case the Ministry have excellent ns for the action they have taken; for the circular signed to end a long-standing abuse. A coöperation nised to hire out private nurses for genuinely private is one thing; but when hospital nurses resign hospital work, join the coöperation, and are then l back to the hospitals at a fee considerably higher the salary they were receiving from the hospital; when moreover they thereby set themselves free hospital discipline by an attitude to authority h may be summarised as "Very well then. I shall it is obvious that something must be done. This is a new practice; already before the war it was causing ous trouble in London hospitals. In a report as long as June. 1938. the Voluntary Hospitals Committee London said:

> "Many of the private coöperations appear to have tgrown their original function (supplying of nurses for mporary private work either in the patient's own home, nursing-home. or private ward in hospital) and advertise r nurses to take general duties in hospitals. They have rge numbers (in one case, several hundreds) on their oks engaged solely in general duties in hospitals. Such rses are employed to supplement the permanent hospital affs at salaries of £2 2s. or £3 3s. per week. plus residence. ome years ago a few of the 'special' and smaller hospitals, xperiencing difficulty in keeping their staffs at full strength. mployed a small number of nurses from private coöpera ions in emergency and during holiday periods, but recently he practice has grown and new agencies have sprung up. ften on a 10% or 15% commission basis, so that now undreds of nurses, attracted by the higher remuneration nd greater freedom from restraint, join the private coöpera ions expressly for hospital duties. Many of the permanent taff become dissatisfied and unsettled. feeling it an injustice hat temporary staff performing exactly the same duties hould be getting in some cases more than double their alary, while free to terminate their engagement at any ime by giving twenty-four hours' notice. Moreover, the onstant changes in the staff make it extremely difficult to naintain a good tone or high standard in the hospitals."

With a shortage of nurses, and disparity between the tes paid in hospital and the rates demanded and tained for nurses hired out by the coöperations. it s naturally been difficult for authority to intervene. reaching its decision to do so the Ministry has had to strike a balance between, on the one hand, the embarrassment that will be caused to hospitals still desperately short of staff. which have come to regard the employment of "private" nurses as a regrettable necessity, and, on the other hand, the probability that a good many nurses will return to hospital work under conditions decidedly more satisfactory to the hospitals. Taking into account the improvement in the rates of recruitment of nurses to hospital work, and the somewhat increased rates of pay, the Ministry has decided that the racket should now be ended.

THE HYGE B.C.G. STATISTICS

Dr. Tage V. Hyge's schoolgirls in Denmark promise to become as famous in the history of B.C.G. vaccination as Dr. Heimbeck's nurses at the Ullevaal Hospital in Norway. In both cases several of the requirements of an experimental investigation are fulfilled, and in both cases follow-up studies are being pursued. It will be remembered that Hyge's schoolgirls. numbering several hundreds, belonged to a large school in Copenhagen where the story began in October, 1941, with the discovery of a case of cavernous pulmonary tuberculosis in a girl of 15. This discovery led to systematic tuberculin and other investigations of the scholars and their teachers. Early in 1943 there was an almost explosive. influenza-like. outbreak of tuberculosis in the school, and the source of the infection was found to be a teacher. The children were classed according to whether they were originally tuberculin-positive or tuberculin-negative, the latter being put in two groups according to whether they were or were not vaccinated with B.C.G. Like Heimbeck. Hyge found a low tuberculosis-rate among the originally tuberculin-positive girls, and among those who. originally tuberculin-negative, were vaccinated with B.C.G. On the other hand. the tuberculosis-rate was very high among the originally tuberculin-negative who were not vaccinated with B.C.G.

From time to time Hyge has published further observations, and now, after an observation period of five years, he brings his figures up to date.[1] Of the 94 originally tuberculin-negative girls exposed to infection and not vaccinated with B.C.G., 70 became tuberculin-positive. and 41 of them showed definite signs of tuberculosis. Of the 106 originally tuberculin-negative girls exposed to infection and vaccinated with B.C.G., only 2 developed pulmonary tuberculosis. Of the 105 originally tuberculin-positive girls exposed to infection, 4 developed pulmonary tuberculosis. Hyge concludes: "We ought therefore to vaccinate with B.C.G. all who are tuberculin-negative."

REMOVAL OF THE AURICULAR APPENDIX FOR EMBOLISM

PERIPHERAL arterial embolism is a common complication of mitral stenosis. and in over 90% of such cases the emboli arise in a thrombus attached to the wall of the left auricle, or more usually its appendix. The arterial embolus can be successfully removed, but recurrence is common because the auricular mural thrombus remains. and recurrent embolism is often fatal because the cerebral arteries are apt to be involved. The only radical cure lies in removal of the thrombus.

American workers[2] have shown that in dogs it is feasible to resect the appendix of the auricle and that the scar in a short time has a complete internal covering of endothelium. Following this approach Madden[3] has operated on two patients. The first. a woman of 38, had had an embolism of the left common iliac artery. treated by embolectomy, in 1946. Over a year later the right popliteal artery was similarly affected and success-

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[6] Moncorps, C., Kalkoff, K. W. *Med. Klin.* 1947, 42, 812.
[7] Ravina, A. *Pr. méd.* 1949, 57, 343.
[8] Heilmeyer, L. *Dtsch. med. Wschr.* 1949, 74, 161.
[9] *Lancet*, 1948, i, 582; *Brit. med. J.* 1948, ii, 769.
[10] See *Lancet*, Aug. 6, p. 264.

[1] *Nord. Med.* June 17, 1949, p. 1058; *Ugeskr. Læg.* May 19, 1949. p. 560.
[2] Hellerstein, H. K., Sinaiko, E., Dolgin, M. *Proc. Soc. exp. Biol., N.Y.* 1947, 66, 337.
[3] Madden, J. L. *J. Amer. med. Ass.* 1949, 140, 769.

Annotations

SICKNESS AND THE N.H.S.

THE routine collection of statistics can be justified only by their usefulness either in research or in administration. In this last respect at least, the work of the Social Survey [1] on behalf of the Ministry of Health is now paying its first dividends. In the heated discussions inevitable during the birth of a new health service, some cold facts may have a sedative effect.

Since 1944 the lay interviewers of Social Survey have been visiting the homes of a small randomly selected sample of the adult population of England and Wales. Those interviewed are asked about their sickness experience in the previous three months, the incapacity thus caused, and the frequency of consultation with the family doctor; and at the same time information is collected about age, sex, and economic status, so that incidence, prevalence, and incapacity rates can be worked out for the corresponding groups of the population. Similar surveys were conducted during the second six months of 1946, 1947, and 1948, and these permit comparison of the estimated frequency of illness and the calls made on general practitioners during the three periods, before and after the coming of the National Health Service. Some criticism has been levelled at this type of morbidity survey; but, so far as these simple measures are concerned, their consistency over the months suggests that their evidence is reliable. For want of better, these results can be our present guide.

The monthly sickness-incidence rates—i.e., the numbers of *persons* reporting some illness or injury during the month per hundred people interviewed—were in 1948 almost the same as in the corresponding periods of 1946 and 1947. Closely related to these are the prevalence-rates based on the numbers of *sicknesses* or *injuries* suffered by those interviewed, and, as expected, they show little real difference in prevalence in the three periods. On the other hand, incapacity-rates, which derive from the numbers of days away from work, or (among those not employed) the number of days confined indoors, did show some significant trends. For example, among elderly women (aged 65 and over), the incapacity-rate in 1948 reached the record level of 430 days lost per month by each hundred women interviewed. In general there was in 1948 an increase in the incapacity-rates of some 25% over the previous years, largely because of greater losses among women and people over 65. At least some of this increase in incapacity among older people may result from a caution advised by their doctors, whom they consulted much more frequently in 1948 under the new régime. Though the consultation-rates for men between 16 and 64 changed little, women—particularly the older ones—saw their doctors with a frequency greater by 10–26% than before.

A long overdue interest in the welfare of housewives has prompted some comparisons between their sickness experience and that of other women. Direct comparisons are obscured by age differences; but, though housewives do appear to report more frequent illness, they have fewer days of incapacity and consult their doctors no more often than do their sisters. Perhaps this might have been anticipated: when a housewife is also a mother she can seldom afford the luxury of incapacity in the sense used here.

Some tentative suggestions are made that there has been an increase in the consultation-rates among the poor of both sexes, and—a little oddly—among better-off men; but the evidence of this is still insecurely based. Enough has been demonstrated in this report, however, to quieten the wilder statements about our national deterioration, and at the same time to justify the of general practitioners that the new service has in the demands on them. No doubt this increase w still more obvious if children were included in the

It may be of interest to mention here the Gov Actuary's statement [2] that since the middle of there has been a gradual downward trend in the short-term illness, which had risen during the war. figures, he concludes, "suggest broadly that in aggregate the pre-war level of short-term inca had been regained prior to the introduction of the comprehensive scheme of National Insurance in 1948."

NEOMYCIN AND TB1-698: TWO TUBERCULOCIDAL DRUGS

STREPTOMYCIN has two serious drawbacks as a therapeutic agent in tuberculosis—its neurotoxicity the relative ease with which the tubercle bacillus acquire a resistance to it. It was hoped that these be overcome by the use of dihydrostreptomycin. although this derivative is less toxic than the substance, it produces resistance in the bacillus. sulphones and *p*-aminosalicylic acid, though useful, less effective than streptomycin. So we must still tuberculosis as a killing disease for which a fully factory remedy remains to be discovered. Perhaps n has been more aware of the limitations of strepto than Waksman, its discoverer. With his team at R University, New Jersey, he has, during the last years, isolated many thousands of cultures, actinomycetes belonging to the genus *Streptomyces*, soils, composts, peats, and other natural substrates, the hope of finding a non-toxic antibiotic effective the tubercle bacillus yet not producing resistance protracted administration. These investigations resulted in the discovery [3] of a new antibiotic, n neomycin by Waksman, which appears to satisfy t criteria. The organism producing neomycin was ob from the soil and is related to a culture isolated as back as 1915 by Waksman and Curtis and design as *Streptomyces fradiæ* (*Actinomyces fradii*). The an biotic can easily be removed from the culture med in which it is grown and concentrated by the method adsorption and elution that have been developed for isolation of streptothricin and streptomycin. It i basic compound, soluble in water, thermostable, active against numerous gram-positive and gra negative bacteria, especially mycobacteria. The an biotic has not yet been obtained in crystalline form and very little is known of its chemical nature. In-vivo tests and observations with hens' eggs and mice have shown that neomycin is as active against streptomycin resistant as against streptomycin-sensitive strains tubercle bacilli, and that it is more active than strept mycin against some strains of *M. tuberculosis*. Neomyc has a relatively low toxicity and so far, apparently, h not produced resistance in organisms sensitive to it. Th results are indeed promising: but its true value cann be assessed until there is enough of the antibiotic f clinical trials.

With the sulphonamides as starting-point, Domagk and his collaborators in Germany attempted to prep a new series of tuberculocidal drugs derived from sem carbazide. The most effective appeared to be the thi semicarbazone of *p*-acetamidobenzaldehyde, or TB1-6 Levaditi,[5] of the Institut Pasteur, Paris, finds that experimental tuberculosis in mice the effect of this d is comparable to that of *p*-aminosalicylic acid, the

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[1] Registrar-General's Quarterly Return for England and Wales for quarter ended March 31, 1949. H.M. Stationery Office. Pp. 20 and 29.

[2] Report of the Ministry of Health for the year ended March 1948. Cmd. 7734. H.M. Stationery Office. 1949. Pp. 12

[3] Waksman, S. A., Lechevalier, H. A. *Science*, 1949, 109, 305

[4] Domagk, G. *Dtsch. med. Wschr.* 1935, 61 250. Domagk, Hegler. Chemotherapie bakterieller Infektionen. Leipzig, 19

[5] Levaditi, C. *Pr. méd.* 1949, 57, 519.

Points of View

THE DOCTOR'S PROFESSION*

3asis of a Christian Attitude to Medicine

TORS have to be trained to perform tasks of the oncrete and practical kind. Bullet wounds and ted appendices are not subjects which readily age a taste for abstract speculation. The result most doctors are much more at home in discussing ilar problems than in dealing with general prin- and are suspicious of the facility with which phers and theologians discuss general principles, lly in relation to medicine. Such suspicions may ntly be justified, but they do not do away with cessity for discussing general principles, whether tion to medicine itself or to life as a whole. The t-matter of medicine, the human personality, is a x amalgam of mind and body, and on many s of great medical importance it is impossible to a responsible decision unless the doctor knows his fundamental beliefs about the nature and y of man are.

night, perhaps, be argued[1] that the progress of al study itself has suffered because doctors have nited a conception of what constitutes a practical ach to their subject, so that many aspects of it a neglected and discoveries are not made because lation of the different parts of medicine to one er is not clearly seen. The rudimentary character ch of the study of social medicine may be taken case in point. Whether that is so or not, there e no doubt that too little attention is paid to the n of medical practice to their fundamental beliefs man and his nature, even among those who hold definite views. Christians themselves, as was l in our first essay, are often at fault here. Roman lics have the great advantage of possessing a y-defined position which enables people to know certainty where they stand; but even they com- y state their attitude upon such particular issues as control, abortion, eugenics, and euthanasia with clarity and frequency than they do the fundamental iples upon which those attitudes are based. Most stants have to confess that they have not given ing like enough thought to these subjects. Christ- n medicine today have a duty not merely to make more emphatically clear their position on familiar oversial issues but also why they reach their ion and how their underlying beliefs illumine for their understanding of their work.

rt of the hesitation Christian doctors experience in this is due to the fact that comparatively little nce is available for them. It is true that state- s about the nature of man from a Christian point ew abound, and that many of these are detailed admirable.[2] But such statements are inevitably t man in general, and very little work has been done ie specific question of the Christian doctrine of man affects the work of the doctor.[3] Clearly realising tentative and humble any conclusions reached may be, we shall try to indicate at least how such a task might be approached.

CHRISTIAN DOCTRINE

Christians start from the belief that the universe is not a fortuitous collection of atoms, which possesses no more coherence than that which the unaided rational intelligence is able to impose upon it, but is the sphere of the operation of a God who has made it and who guides and sustains it. This God has made known to mankind His own nature and His purpose for men in a great historical movement of self-revelation which reaches its climax and fulfilment in the person and work of Jesus Christ. All orthodox Christians would be at one in asserting that, in the light of this revelation, man's true nature is seen to be that of a responsible person living in close fellowship with God and striving to bring all his relationships with other people and with the world in which he is set into conformity with God's will as it is made known in Jesus Christ.

There would, however, be divergencies among Christians as to what this conformity involves in some matters. In particular, Catholics would be divided from many Protestants on the question of the status of "the law of nature." This, of course, is something different from what the average student of science understands by a natural law. Catholics would assert that there are certain fundamental truths about man and his relation to the universe in which he is set which can be apprehended by all men, whether they are Christian or not, although the Christian revelation confirms and further illumines them. These truths range from the assertion that there is an objective distinction between right and wrong to quite concrete statements about the nature of the State, or of economic justice, or of the nature of the act of sexual intercourse. Christian obedience involves not merely obedience to the express will of Christ, as declared by Him and as understood by the Church which seeks to live in His Spirit, but also obedience to the natural law. Protestants, however, attach much less importance than do Catholics to this concept of the natural law. Many Protestants would assert that they see no clear evidence for its existence and that the very use of the concept encourages men to claim divine authority for what are in fact highly ambiguous human judgments. They would maintain that in trying to understand man's nature they had to study the content of human experience in precisely the same way as other men did, with no finally determined norms except those which arose out of the revelation given by Christ. This has important practical consequences in regard to the attitude taken up by differing Christian groups on such questions as the rightness or wrongness of the use of contraceptives.

Despite such differences, all orthodox Christians would be entirely united in asserting two things: first, that although all men belong to God the whole race of men have become estranged from Him and in so doing have cut themselves off from the source of life and health, thus becoming corrupted by disease and mortality; secondly, that through Jesus Christ men are reconciled to God, who makes available to them power to overcome the corrupting influence which lies behind disease and mortality. This understanding of human nature in the light of God's dealings with men leads Christians to hold a distinctive attitude to life and death and pain and health which is of great significance for the doctor's understanding of his task.

REVERENCE FOR HUMAN LIFE

First, the Christian doctor has an intense reverence for human life as a precious gift from God. In the beginning "He made all things good" and made man in His own image as the crowning glory of the Creation.

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* r essays arising from discussions held under the auspices of he Christian Frontier Council (8, The Cloisters, Windsor astle). For permission to print them we are indebted to the tudent Christian Movement Press Ltd. (58, Bloomsbury treet, W.C.1) which is shortly publishing them in full, with thers, under the title *The Doctor's Profession.* This book is ikely to appear in October, and the probable price is 4s. 6*d*.

[1] by Dr. F. M. R. Walshe, F.R.S., *Lancet*, 1947, ii, 817.

[2] ota [illegible] atements are, on the Protestant sid [illegible] nner (Lutterworth Press, 1939), an [illegible] *Humanism* by Jacques Maritain (G [illegible] essay by V. A. Demant in *Pr* [illegible], 1946).

[3] *he Wholeness of Man, a Study in the History of Healing*, by P. L. Garlick (James Long lectures for 1943), published by the Highway Press, is an exception.

fully treated. Further emboli seemed likely, so after an interval of six weeks the left auricular appendix was excised. During the operation the heart stopped and cardiac massage was required, and a cerebral embolus probably occurred, leaving a left hemiparesis. But there was almost complete recovery, and there have been no further emboli. In the second patient, a man of 52, a successful embolectomy at the bifurcation of the abdominal aorta in December, 1947, was followed by resection of the left auricular appendix in March, 1948. The postoperative course was satisfactory until the ninth day when the patient suddenly died. Pathological study of the resected auricular appendix showed that it was almost certainly the origin of the thrombus.

The clinical diagnosis of an intracardiac thrombus may be very difficult, and no one sign or symptom is pathognomonic. Madden says that the condition may be suspected in cases of (1) coronary thrombosis with peripheral arterial embolism, or (2) chronic valvular heart-disease with auricular fibrillation and either pulmonary or peripheral arterial infarction. In the cases with coronary disease the thrombus is usually ventricular, and it is only in cases of rheumatic heart-disease with mitral stenosis and one or more peripheral arterial occlusions that resection of the left auricular appendix is worth considering.

YOUNG MEMBERS

"ALL education is social education," Mr. George Tomlinson remarks in a foreword to a new Ministry of Education pamphlet,[1] "simply because we are members one of another." The pages which follow are a study of the meaning of citizenship, and its practice in the schools and in after-life. To be a citizen in Athens in the fifth century B.C. was to have clear civic responsibilities. Today we do not live so entirely for and in the State; and this may be a good thing if it leaves us free to grow to be citizens of the world. Nevertheless, the difficult art of living in a community must be acquired in a small way first, even by citizens of a world State.

The child encounters the rule of authority and law first in his own home; he also encounters justice, and perhaps injustice. The kind of injustice—or what seems like injustice—which most children experience at one time or another is the revenge of a parent exasperated by some trivial last straw. Perhaps this in itself is not such bad social training (though the pamphlet does not discuss it), being an epitome of society's response to prolonged irritation; and perhaps the child had better get used to it early, and learn to conduct himself with tact. But such moments of human failure apart, if he is to have a fixed sentiment of respect for justice later, he should be able to count securely on justice as his portion in the home. Even more certainly he should be able to count on affection; and if his home in addition supplies forbearance and understanding he is in a favourable position to build up a stable system of human values.

The pamphlet is remarkable in being the first official document for some time to relate these values directly to religion, and especially to Christianity. Despite the imperfections of Christians and Christian Churches, it suggests, Christianity has been the most enduring civilising force seen in the world. Nevertheless the writer concedes that the love of justice and truth, the appreciation of beauty, with a sense of duty and compassion, can be responsible for achievements "of which all good citizens, without distinction of belief, may be proud."

On the standards formed in the home the child must superimpose the wider and in some ways more exacting standards of the school, since the moral values and ideals he acquires there are generally higher than those of society at large: "the transition from school to is often something of a moral shock." The remedy this, the pamphlet suggests, is not less idealism in and school, but more in daily work and daily pl For hundreds of thousands of young people work dull routine, and leisure means the cinema or the hound track, the palais-de-danse and the par They are bored, listless, emotionally hungry. girls, especially, have no hope of escape from the pattern except through marriage, as Pearl J has pointed out.[2] Better use of leisure time will redress the balance; but the real answer, the pa argues, is better human relations on the spot:

> "To understand other people's point of view; to orders persuasively as between one human being and and to give the reasons that make orders intelligible acceptable; . . . to give a good day's work as a ma ordinary honesty and to . . . reward a good day's work decent working conditions and a fair share of the rewards; to make a bigger sacrifice oneself than those asked of people and to take no credit for it—these are the simple maxims for the lack of which the work of a big org may jolt along with unnecessary friction and waste."

But of course they are not simple at all. To achieve atmosphere in an industry—or for that matter in group of people working together, whether in a h a college, a ship, a theatrical company, or an else—is a complex feat, depending on such things as good will and determination of a small group, a co interest and purpose, and a tradition of service coöperation. It is a weakness of this pamphlet that takes universal good will for granted, and attends the disruptive forces in society only sufficiently imply that we should be better without them.

This one-sided approach is perhaps justified, howe when the practice of citizenship in the schools is disc for teachers need no reminders of the disruptive f in their midst. In our preoccupation with the pro of our day, the pamphlet warns us, we must not ass that they have a like fascination for the young, and carry into the classroom "matters which are beyond understanding and fail to arouse the interest of child They do need, however, to know something of the and national institutions through which we are gov earn our living, and manage our affairs: and an u standing of these things can be gained through studies, in which the children map their own neighhood, examine its industries and agriculture, and study transport system and the goods it exchanges with places. They may visit local institutions and indu and wider horizons still are opened when the "adopts" a farm or a ship, or when—for exam a girls' school council manages a scheme of part-help in hospitals, homes, and small local shops. Ed tion for home life could well extend to household re which interest children of both sexes, and can be used introduce them to facts about items of food, clothi and household equipment—where they come from why some are scarce. Gardening, poultry-keeping, the care of pets, and questions of design and style house equipment, are topics round which teachi explicit or implicit, can range. A science course c teach method, and is often used for that purpose only but it can also be used to teach the scientific background of our civilisation, and the effects of science world food-production, population increase, soil erosi and pest control. Sex education is allowed its pl among other studies; but, as the London County Cou has put it in some recently published notes quoted in pamphlet, "reproduction is an important, but not preponderant feature of the living organism at work it should take its place, but no more than its place, the teaching of biology."

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[1] Citizens Growing Up. Ministry of Education Pamphlet no. 16. London: H.M. Stationery Office. 1949. Pp. 55. 1s.

[2] Rising Twenty. London, 1948. See *Lancet*, 1948, ii, 698

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DEATH

The Christian's attitude to death is, of course, closely linked with his attitude towards life. To the Christian death is not the collapse of the physical organism which carries with it the destruction of the personality ; nor is it necessarily, as a surprisingly large number of people believe, the automatic release of the soul, whatever its relation to God on earth, into a condition of eternal bliss. Death for the Christian is the great crisis of human experience. It is the event which makes clear to the strongest and proudest of men that they are frail and mortal creatures who cannot live unto themselves but are always in the hands of the living God. It is the great tragedy of our human existence because in it the deep rift between what we aspire to and what is possible to us stands most vividly revealed. It is also the great trial of the Christian's faith ; for it is only when he stands face to face with the enemy that a man is able to know with assurance whether he believes in the power of the risen Christ and whether that power is able to sustain him through the darkness.

It is fitting, therefore, that the whole demeanour of the doctor in approaching death should be one which recognises the gravity of a great and solemn mystery. This is true of death in general, quite apart from the particular issue of euthanasia, which has already been touched upon. In treating a dying patient the doctor should realise fully that he is being present at an event of great importance, and do the utmost in his power to help the patient to make a good end. It is clearly essential that, provided he shows a proper common sense and sensitivity in doing so, the doctor should inform the patient when his end is near, and strive to make proper provision for the patient to see a priest or minister before it is too late for him to make adequate use of their ministrations. It may not be inappropriate to mention here that the provision made by Catholics for ministering to the spiritual needs of the dying often proves in experience to be much more satisfactory than that made by many Protestants, who sometimes suffer from vagueness and embarrassment. This is a matter which should be looked at very carefully by Protestant ministers. Provided he takes care not to obtrude his own personality unduly, the doctor himself can often be of great help to patients as they face death in these days of spiritual confusion and uncertainty. While the busy doctor who is constantly in attendance upon the dying can hardly be expected to be pondering constantly upon the meaning of death, he would be an insensitive Christian indeed if its challenge and test and promise did not frequently press home upon himself the question of his own relation to his Judge and his Redeemer.

It need hardly be said that Christians should show a proper reverence for the human body in death as in life. The mortal remains of immortal souls are not "stiffs" to be treated like so much horseflesh. The profession has a high tradition in these matters, but it is a tradition which can easily be dissipated by carelessness and thoughtlessness, and it is worth taking trouble to ensure that standards of behaviour in the dissecting-room are always maintained at a high level.

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[4] See *Lancet*, 1946, ii, 798, 850, 882, 961.

It must be emphasised that it is the desire to cherish and preserve the divine gift of life to man which is the ultimate justification of the profession of medicine from a Christian point of view, and not, as is perhaps more commonly said, the desire to relieve pain and suffering. The parable of the Good Samaritan, which is itself frequently misunderstood, is not the only or the most appropriate text to justify the work of the Christian doctor. The desire to relieve pain and suffering is, of course, included in the other, and is itself part of the Christian's essential work of healing compassion; but to give it the overriding primacy is sometimes to leave open the door to dangerous sentimentality.

Christians believe that each individual human being is infinitely precious in the sight of God, and that, because that is so, the true well-being in God's sight of each individual (which is not the same as his immediate comfort or convenience) cannot be sacrificed to what is conceived by some to be the physical well-being of the race. This conviction of the infinite worth of each particular individual is shared with Christians by many people who do not claim the Christian name but who sometimes put Christians to shame by their ready service of the weakest and most insignificant of their fellows. To the Christian, however, it must always seem that the reasons such people give for holding to their conviction are not very well grounded. He would say that the realisation that each individual soul, however poor or socially ineffective it might be, is infinitely precious is not one which can be rationally deduced from the ordinary experience of those who have humanitarian impulses but one which can only find an adequate justification on the basis of a knowledge of what the divine predestination means.

The word "predestination" has an ominous sound in the layman's ears, but that is largely due to a misunderstanding. Christian predestination does not mean that God has chosen some to be His children and rejected others, according to an unaccountable caprice of His own, so that those who are not chosen do not matter and deserve no consideration. It means that God has a purpose for mankind which He reveals to the individual as a purpose in which he has a specific part. Its nature is such as to emphasise our solidarity with each other in the fulfilment of that purpose, and to remind us that even those who, to our eyes, seem the weakest and most unworthy of creatures, may have a part to play in its fulfilment of which we may at present be unaware. It is because of this that the Christian insists that we have no right to treat lightly the lives of those who perform no useful economic or social function or who are nuisances or menaces to their fellows. He will always remember that the difference between himself, in his personal unity, and the worst and most useless of God's creatures, is at best slight in God's eyes; and he will certainly not presume to try to pass the judgment of God on the worth of the life of a fellow-man while God permits him to live. Thus Christians treat with great reserve all proposals for the sterilisation of the unfit and uncompromisingly resist all proposals for the legalisation of euthanasia, at least as that is commonly interpreted.

It might be argued that this is contradicted by the attitude of at least a large majority of Christians, who would be prepared to justify the wholesale slaughter of large numbers of human beings in war on the ground that it would mean the setting right of intolerable injustice and make life better for future generations, or who would permit the forcible restraint, and if necessary the killing, of a madman running wild through a town and possibly spreading a deadly infectious disease. Without taking sides in the familiar pacifist controversy, it may be claimed that this contradiction is more apparent than real. There is a clear distinction between a situation in which, through the evil actions of men, a
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Reconstruction

UNITS IN HOSPITAL COSTING*

J. E. STONE
C.B.E., M.C., F.S.A.A.
OR, DIVISION OF HOSPITAL FACILITIES, KING EDWARD'S
HOSPITAL FUND FOR LONDON

ER the accounting regulations of the National 1 Service Act, 1946, the maintenance expenditure ospital is required to be set out under 18 headings, with a few appropriate subheadings. The expen- under each of these headings on outpatients is ted. The resulting balances represent the supposed diture on each item for inpatients. Each of these items is then divided by the average number of ied beds, and the quotient is the "average cost per ied bed." This is the unit of cost to be used to are hospitals one with another. It was the method under the Revised Uniform System of Hospital unts, and it has been the subject of severe criticism any years.

PER OCCUPIED BED

e reasons for this criticism are not theoretical; they ased on the experience of trying, without success, ake comparisons between things which were not arable. And many of the items are not comparable he basis of the occupied bed: for instance the unts deducted for outpatients are approximate, for hospitals maintain separate accounts of expenditure tpatients. Again the different methods of accounting preparation of statistics in use are evident from the nents of witnesses before the Committee on Esti- s. Thus the unit of the cost per occupied bed be, and indeed is, unreliable, and those who rstand the peculiarities of hospital finance do not pt it.

NO COMPARISON

et us take this unit and try to compare two hospitals. Annual Statistical Summaries of King Edward's pital Fund for London (discontinued since the start he National Health Service) show that the lowest per occupied bed in the medical-school hospitals up was £629, and the highest £967, a difference of £338! cannot account for this big difference unless we are ished with much more detail than is contained in general figures in the Summary and the published unts of the hospitals. It may be argued with reason t it is not possible to burden the published accounts h a mass of detail. But the answer is obvious. A hos- l, whether it publishes the details of its accounts not, should always be in a position to furnish m.

t could do so, without any trouble, if it maintained ystem of cost accounts showing the cost of working h ward and department: the unit cost of each: l the constituent elements of this cost. Without s information, it cannot do so, and it is compelled fall back on such replies as: "we have a very large ray department which does a lot of treatment work": ur stores department was reorganised last year": new laboratory was opened which involved a big rease in our staff": "the hospital has been painted"; "a lot more bedding was bought during e year, thus increasing our expenditure unduly for last ar"—as if this kind of item were peculiar to any e hospital. Inquiry might show that the other hospital d done all these things, or some of them, but even en such an inquiry would be inconclusive, for neither spital would be able to produce informative figures.

The wide range of differences in the nature and extent of specialised treatments and services available is another factor which renders this unit of cost practically useless for making comparisons between hospitals. Some hospitals possess elaborate and up-to-date accommodation, and apparatus for radiology and all modern forms of electrical treatment: in others, these facilities may be limited, and the volume of work negligible. On the other hand it might well be that despite limitations the volume of work was even greater. One hospital may have 3 operating-theatres; while another, with the same number of occupied beds, may have 6. Then again, there may be differences in the physical arrangements—area, lay-out, distribution of wards: the number, nature, and proportions of general and special wards; the nature and extent of research work, and of social services. Whether medical records are looked upon as an asset or merely a routine job has a great influence on the cost of that department. The interest, or otherwise, which the authorities take in catering also influences cost. There are differences in the percentage utilisation of available beds, variety and sex of patients, and average length of stay.

AN UNSATISFACTORY UNIT

Where so many different kinds of services are concerned, the average cost per occupied bed calculated on the total expenditure for inpatients is meaningless, and the Voluntary Hospital Commission, in its final report,[1] described it as "at best an unsatisfactory unit." Some hospital activities may, of course, rightly be costed on this basis—e.g., wards; though here again distinction must be made at least between (a) general and special wards, and (b) adult and children's wards. But for most services—operating-theatres, dispensary, X-ray and electrical treatment departments, boiler-house, works department, nurses' home, to mention only a few—it has no statistical value. Ambulance service is the same for a patient brought to the hospital for a four-day stay as for one brought for a month. Twice as many laboratory tests or examinations are not usually carried out for a patient who stays in a hospital for four weeks as for one who stays only a fortnight.

With a uniform system of costing, discussed in our first article,[2] real comparisons would be made possible. With the expenditure on each ward, department, or service available, X-ray department could be compared with X-ray department: kitchen with kitchen: ward with ward; and not only on the total expenditure in each of these units, but also on the unit cost and its constituent elements.

SUGGESTED PLAN

It is not easy to determine exact units of cost; but the following tentative list, which is not exhaustive, may stimulate thought on the subject. The units costs suggested bear no relation to the subject matter of the expenditure—i.e., provisions, surgery, and dispensary—but are determined by the nature of the services covered by the expenditure.

1. Wards	(a) Per occupied bed in respect of all items of expenditure which vary directly with the number of patients under treatment—e.g., provisions, drugs, and dressings.
	(b) Per established bed in respect of all items of expenditure which do not necessarily vary with the number of patients under treatment—e.g., heating, lighting, and cleaning.
2. Operating theatres ..	(a) Per operation performed (weighting may be necessary to allow for adjustment of major and minor operations).
	(b) Per hour operating-theatre in use.
3. Laboratories	Per test or examination.

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* Second of a series of three articles. The first appeared on July 30.

[1] Voluntary Hospital Commission. London, 1937.
[2] *Lancet*, July 30, p. 212.

SUFFERING

Apart from his attitude towards life and death, perhaps the most distinctive of the attitudes of the Christian doctor is that which he holds towards suffering. Why do men suffer? Many answers have been suggested to this perennial question, and we shall hardly be expected to give a comprehensively satisfying answer here.

The Christian knows, however, that suffering is ultimately due to sin. In saying this, it must be emphasised that sin is not primarily the overt acts of wrongdoing committed by particular individuals, for which pain is conceived of as a punishment, but the fundamental estrangement of the whole human race from God the source of its life and health, an estrangement in which we all have part, whether we are called to great suffering or not. But by His suffering and death upon the Cross, Jesus Christ has borne the burden of this sin and opened up the way of reconciliation between God and man. It is the testimony of many who have borne great pain in faith in Him that their suffering has been caught up in His agony, and, through the realisation that they are entering into an understanding of the burden He bore for mankind, has been turned into a privilege and a blessing.[5]

Although suffering can be thus transformed, that does not mean that it is good in itself. However much, as the austere words of the Order for the Visitation of the Sick in the *Book of Common Prayer* remind us, it may be used as an occasion for the Lord's correction and for self-examination and penitence, in itself it is the fruit of our sinful heritage, the sign of the radical disharmony Christ came to set right. Thus, although the conquest of suffering has in itself no redemptive power, the Christian doctor is entitled to regard his work in overcoming it and the disease from which it springs, as part of that reconciling work which Christ initiated and sustains and in which He calls His followers to share. The doctor is, in however humble a way and however unworthy those to whom he ministers may sometimes be, trying to undo the effects of man's estrangement from God, as our Lord Himself did in His works of healing, and in that task he may confidently expect the divine blessing.

> "We have forgotten that Christ took a human body and spent the greater part of His time on earth in healing the sicknesses of it; we have not confessed that the body and the earth are as much redeemed and regenerated by Him as our spirits or intellectual powers; we have not confessed the meaning and power of the Resurrection. A man who fully believes in Christ's Regeneration must regard every physical study as a sacred study—physiology as the most sacred of all."[6]

The beneficent discoveries of modern medicine have a closer relation to the redemptive purpose of Christ than many even among Christian medical men allow. They have come because men have learnt to look upon the human constitution and its environment in a certain way, a way which, as the passage just quoted indicates, is in harmony with the Christian belief in the regeneration of mankind. A firmer grasp of that belief may be the essential precondition of the further development, enrichment, and purification of medical knowledge.

It is in the light of the doctor's reconciling task that the question of the methods which are justifiable for the relieving of pain can best be discussed. It is easy lightly that suffering can be a way to an enric sonality. The doctor knows that that is certain true of many forms of suffering, which are exhausting or enervating or else so intense as to out all thought of everything except themselves. suffering as a privilege is a gift of grace, possible because with God all things are possible. To suffering, or even to take pleasure in suffering, refuse all reasonable means for the alleviation of s is a tempting of God and a deadly form of pride, if not of mental perversion. The habit of intensely religious people of gloating over su fortunately rarely to be met with in the modern cannot be justified on Christian grounds. At the time, the doctor will not go to all lengths to pain. The weapons at his disposal for this pu very powerful, and may be dangerous not only but also, and more insidiously, to human pe itself. The risk, for example, that his patient a victim to drug-addiction as a result of his e "kindness" must be always in his mind. He remember that our primary purpose on earth is make ourselves comfortable with the minimum of and strain but to prepare ourselves for eternity, and this may sometimes, though rarely, lead us to t hard and painful way, in dealing with bodily pain so many other matters, rather than the "sensible the "humanitarian" one.

PURSUIT OF HEALTH

It might appear that the Christian should have thing positive to say about the nature of health. from one point of view, is the doctor's primary Yet, so far, the nature of health remains largely un whether by Christians or anyone else. Most of people who attempt to define it are cranks, who simply by taking one aspect of it and giving it exa importance. A great deal of work clearly needs done on this matter before very much beyond observations about the avoidance of excess and a *mens sana in corpore sano* can be said. We shall ourselves with one remark. The Christian will not the pursuit of bodily health an end in itself nor even take extravagant steps to avoid the risk of ill and injury. He will remember that he lives in a world and that he cannot live fully and satisfact it without accepting the reasonable risks of pain misery which such a life entails. This, in fact, is most doctors do without much thought in regard their own personal habits of life, cheerfully a such hazards as risk of infection when they are u able. There is a healthy strain in Christian which refuses to treat the body and its needs and with excessive seriousness. The Christian doctor w disposed, therefore, to regard a good deal of resp modern medical practice as a form of panderin valetudinarianism, the unhealthy product of an unhea society.

"... in the last resort the reduction of a country's structure *depends upon the willingness of a sufficiently* proportion of its people to discharge what are regar the humbler f . *The citizens* of Britain are all those of other cou —from a sligh . One symptom of for example, is the fact that so great a majority of the in London hospitals are of Irish birth. . . . If the me of a national economy become less willing to serve one a they become collectively *less able* to serve the world be served by it, until their money declines in value and are then all demoted together—i.e., they must all work h and some of them at less genteel occupations, for the return. . . . And after all, it is poetic justice."

—*New English Weekly*, July 28, p

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[5] It is, perhaps, worth emphasising that this does not necessarily involve any *elaborate* or high-level attitude to suffering as it ... The Apostle Paul points out that the ... ing is to put ... aristi ... "tribulation ... and ... good deal of ... and th ... arry with it ... that ... hree articles in the series on Disabilities ... 3, April 17, and May 29, 1948) provide in the ... excellent examples of the kind of attitude towards affliction which the Christian should display.

[6] Maurice, F. D. Theological Essays. London, 1871; p. 216.

of diphtheria prophylactic as now used, and feeling thing should be done which might conceivably interfere ne success of the present immunisation campaign diphtheria, and not wishing to pre-judge the issue, far not made arrangements for the free supply of lactics against whooping-cough. However, it has no to interfere with the liberty of medical officers of to recommend the use of such prophylactics obtained ommercial sources.

yelitis

unexpected outburst began in the end of May, st six weeks before the usual time, and had the edented incidence of 18 per 100,000, four and times that of the largest epidemic (4 per 100,000 8) previously recorded. The peak occurred in the veek of September when 708 notifications were ed. In the calendar year 7766 notifications (includ- lioencephalitis) were made, and 707 deaths were ed to the disease. The case-fatality was 9·1%, west on record, though probably this figure was ed by the well-recognised tendency to notify mild *on*-paralytic cases when the disease is prevalent. idst all that is unknown or uncertain some facts to have emerged recently. The age-distribution of incidence and fatality is undoubtedly changing, there seems to be a progressive relative reduc- in the susceptibility of children, especially those 5. Only one-third of the cases occurred in children 5; one-third were in children between 5 and 15. ty two-thirds of the deaths were in persons over 15.

FOOD-POISONING

e increase in outbreaks of food-poisoning reported ie Ministry continued, their number reaching 765 pared with 598 in 1946 and 422 in 1945.) Among were 668 known to have been due to salmonellæ. e outbreaks, in which the syndrome was similar to produced by salmonellæ, were due to the Sonne ntery bacillus. Moreover, *S. paratyphi* A, B, and which usually produce illness with the clinical ure of enteric fever, may cause outbreaks of acute to-enteritis. Of the 765 outbreaks 55 were due to hylococci or their toxins. These are usually to be rentiated clinically from the salmonellæ type of -poisoning by the extremely short incubation, of 4 hours, which usually precedes the acute symptoms, rally without pyrexia; the attack ends in rapid very.

y its expert assistance to medical officers and practi- ers, the Public Health Laboratory Service has tly stimulated the reporting to the Ministry of reaks of food-poisoning of all types. So many people adays eat communally in canteens that an infected cle of food is likely to cause illness among a con- rable number of persons in any one outbreak.

o prevent outbreaks the two most important points to t on, besides the elementary one of scrupulous cleanliness, (*a*) that all food-handlers should thoroughly wash their ds and lower arms before touching the food, not only n they begin work but also every time their work is rrupted, and (*b*) that as far as possible the food should eaten as soon as it has been prepared. This latter pre- tion is often difficult to secure in canteens, where meat, es, custard, and puddings, cooked the day before, are n reheated before consumption. Unfortunately the eating does not destroy staphylococcal enterotoxin. If d has to be kept after cooking it should be placed in frigerator as soon as possible to prevent the multiplication ny bacteria it may contain. Several outbreaks have been to defective refrigerators.

VENEREAL DISEASES

A marked fall in new cases suggests that the war-time e of venereal infections may now have turned, and at efficient and rapid treatment, as well as a growing blic awareness of these diseases, will result in a pro- essive decline. The efficacy of modern treatment is well shown by a decrease in infantile congenital syphilis in spite of the record birth-rate in 1947 and the large increase in acquired syphilis during the previous year.

Though the 1947 figures are encouraging, there is no room for complacency. For a fully employed people at peace, the number of new infections is still far too high, and, considering the efficacy of modern treatment, the fall should have been greater than it has been. Penicillin maintains its early promise as a powerful curative agent in both gonorrhœa and syphilis, and there are still no signs that the causative organisms of either disease are becoming resistant to treatment. Nevertheless, the very speed of its action and the ease with which, especially in gonorrhœa, it banishes signs and symptoms, too often breeds a spirit of unhealthy optimism, leading the patient to desert the clinic, sometimes recklessly to expose himself with an unknown consort, before there has been time for adequate tests of cure and the certain exclusion of a double infection. In such circumstances it is often impossible to distinguish between a true relapse and a reinfection.

At one of its earliest meetings the Interim Commission of the World Health Organisation named the venereal diseases, in company with tuberculosis and malaria, as one of the three greatest enemies of the human race, the combating of which deserved the highest priorities.

TUBERCULOSIS

Total deaths from all forms of tuberculosis showed an increase of 3% over 1946, when a new low record was established.

We are reminded that the death-rate from tuberculosis fails to tell the entire story, because tuberculosis, unlike cancer or heart-disease, kills in young adult life or in middle age. In addition, account must be taken of the many years of activity lost by tuberculous patients before death or recovery ensues. The ever-mounting waiting-list for beds could be halved were enough nursing and domestic staff available. The increased number of new cases diagnosed is evidence of activity and awareness on the part of both general practitioners and tuberculosis officers. More than 650,000 civilians were examined by mass radiography during the year, bringing the total so examined since October, 1943, to 2,019,670, of whom more than 94% were found at the time of examination to have no abnormal chest condition. The finding by mass radiography of 257 cases of intrathoracic malignant disease is reported.

A complete review of our general arrangements for the diagnosis, treatment, and aftercare of the tuberculous, and of measures of prevention, is in hand.

NUTRITION

The nation's food-supply, so far as energy-giving foods were concerned, was made worse in 1947 than in earlier years, by the addition, in November, of potatoes to the list of rationed foods. As bread had been rationed late in 1946 this meant that all the main sources of energy were now rationed. The rations, however, of both bread and potatoes were fairly generous, and no evidence came to hand of real privation, though there was doubtless much inconvenience.

Special attention was paid in the clinical surveys to groups of adolescents working in factories. Nothing of a disturbing nature was, however, observed. Indeed the nutritional state of the great majority of the adolescents examined was very satisfactory. In view of this finding it seemed likely that the brunt of any food shortage in families of adolescents and grown-ups was being borne by the housewife. An attempt was accordingly made in London and other cities to assemble for nutritional assessment representative groups of mothers of families of adolescent age and over. It was not found possible to secure representative groups, and while this made any general statement about the nutritional state of this class of mother impossible, the nutrition of those examined was certainly less satisfactory than that of any other group of the population.

The nutritional state of school-children appeared to compare favourably with that of earlier years, but data from 17 areas in different parts of the country showed for the first time since 1941 a slight but definite decline

4. X-ray department	(*a*) Per examination (diagnostic). (*b*) Per treatment.
5. Dispensary	(*a*) Per prescription. (*b*) Per outpatient attendance.
6. Kitchen	(*a*) Per meal. (*b*) Per *basic* meal. (*c*) Per person fed. (Distinction should be made between staff and patients.)
7. Boiler-house	(*a*) Per lb. of steam generated. (*b*) Per lb. of water evaporated.
8. Social service	Per case or per visit.
9. Laundry	(*a*) Per person—(i) staff; (ii) patients. (*b*) Per *basic* article.
10. Ambulance	Per mile run.
11. Nurses' home	Per nurse in residence. (If a training school is included a separate account should be maintained, when the unit cost would be—cost per nurse in training.)
12. Corridors and stairs	Per sq. ft.
13. Gardens and lawns, &c.	Per sq. ft.

The main factors which influence expenditure are: (1) percentage of occupation of available beds; (2) number, and the salaries and wages of staff, which account for 50–60% of the total maintenance cost of the average hospital; (3) engineering and works services 20%); (4) cost of food (excluding cooking and (11%), drugs and dressings (7%). Of these the pe of occupation is affected not only by the inci disease but also by repairs, periodical painting cleaning, during which wards may be closed or closed. It has a particularly important bearing cost per occupied bed. The number of admis the average length of stay are in some measure a tion of the intensity of work at the hospital and demands on the staff, and this in turn tends to the numbers of such staff. The figures of the length of stay in hospital become of paramount tance in ascertaining, not only the cost per bed but also the average cost of treating a patient conclusion. Thus the cost of treating a patient hospital where the average length of stay is consi above the general, though the daily cost is comp low, may be substantially greater than at a h where the average length of stay is low, but the cost is high.

Public Health

STATE OF THE PUBLIC HEALTH

RETROSPECT OF 1947

THE eighth year of austerity, 1947, was a testing year, writes Sir Wilson Jameson, chief medical officer to the Ministry of Health.[1]

Its first three months formed a winter of exceptional severity, which had to be endured by a people who in addition to rationing of food were faced with an unprecedented scarcity of fuel. These three months of snow and bitter cold were followed in April by the heaviest floods for 53 years, which did great damage, killed thousands of sheep and lambs, delayed spring sowing, and threatened the prospect of a good harvest, which was so urgently needed. Immediately after these four months of disastrous weather there followed a period of economic crisis with an ever-increasing dollar deficiency. So acute was the crisis that restrictions more rigorous than any in the war years became necessary. Bread had to be rationed for the first time late in 1946; in September, 1947, the meat ration was reduced; in October the bacon ration was halved; and in November potatoes were rationed. A summer drought accentuated the previous flood damage to the harvest. A steep rise in the prices of foodstuffs and cattle food followed disappointing harvests in many European countries, due to the hard winter and hot dry summer, and in certain crops, notably corn for animal food, in America. Affairs abroad were as depressing as conditions at home.

Nevertheless, the British people made a great recovery in the later months. Production increased, and the year closed more hopefully than might have been expected. Vital statistics and many of the low records of mortality set up in 1946 were again lowered.[2]

THREE INFECTIOUS DISEASES

The three outstanding features of the epidemiology of 1947 are, first, the great reduction in the mortality and incidence of diphtheria; secondly, the threatened invasion by variola major in the first half of the year; and thirdly, the unexpected and distressing epidemic of poliomyelitis.

Smallpox

The numbers of corrected notifications (78) of, and deaths (15) from, smallpox were the highest for many years. These seem to have been due to two importations, one by a soldier direct from India, the other probably seaborne and by a sailor via a French port. Both were of variola major; and the case-mortality was 19%. unsatisfactory feature was that 6 of the cases in persons who, before all others, should have been were not, protected by recent vaccination—a a sanitary inspector, a nurse and a kitchenmaid hospital, a disinfector, and a medical student. departments should review the state of their emp annually as regards immunity. In many cases the features and rash were so much modified by p vaccination as to present great difficulty in di The new laboratory methods proved of great help should be invoked in all cases of doubt. These t outbreaks were successfully limited, without vaccination, by the arduous labours of the various staffs in listing, surveillance, and vaccination of con

Vaccination by the multiple-pressure method was mended by the Ministry as the method of choice late in It is almost completely painless, involves a minimu trauma, and is less likely to be associated with unduly local reactions or septic complications. It is hoped the use of this method will increase the percentage of vaccinated during their first year, for the importan primary vaccination in infancy to the child and to the munity is well established. Postponement of primary tion to a later age; or until it becomes necessary for f travel or military service or from contact with probably entails far more inconvenience and leave community quite unnecessarily vulnerable to smallpox

Diphtheria

For the sixth successive year the number of d was the lowest yet recorded. Moreover, the 244 d at all ages numbered but a little more than half (472) in 1946, and less than one-tenth of the a in the ten years 1931–40. The number of cases in 1947 is also the lowest ever recorded, less than the number in 1946. For the ten years 1931–4 average annual number of *original* notifications about 55,300. The total of original notifications (1 for 1947 therefore is nearly 45,000 below that av This meant a great saving of hospital beds and It released some 2500 nurses for other work, and financial saving was considerable. Such are the already reaped of the intensive immunisation camp

Dr. Percy Stocks shows that the protection aff by immunisation against dying from diphtheria considerably greater than the protection against tracting the disease. The practice of administ "boosting" doses, particularly at entry to school, w markedly increase the protection against attack.

The use of combined diphtheria and whooping- immunisation has many advocates; but the Ministr view of the excellent results given by the distribution

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1. Report of the Chief Medical Officer on the State of the Public Health during 1947: included in the Report of the Ministry of Health for the year ended March 31, 1948. Cmd. 7734. H.M. Stationery Office. Pp. 282. 5s.
2. See *Lancet*, 1949, i, 1028.

rvice mess made it natural to try alcohol as a but I am not a drinking man and the return to y was always so shattering that I gave it up, ough mild intoxication blended with the anxiety a way as to make one feel more normal.

e visual obsessions were terrifying, both because apparent meaninglessness, and because of their dent existence. I often had the most acute for instance, of a hammer and screwdriver g away at my skull, or of my skull being forced and spat into, perhaps at a moment when an r would only have noted [illegible] ng peration or talking to my [illegible] I be opening an abdomen, for instance, and would e most vivid hallucinosis of eyes looking at me from the cavity. At night I was driven to distraction ughts of self-destruction—not by the wish to do by an accurate representation of suicide in various sant ways—and I took elaborate precautions to against this. Silly jingles and rhyming phrases emselves over and over again in my head. Every d again, of course, all this boiled up to an unbear- tensity. Then I rang up the regional Service atrist and got it off my chest with a good deal ng and abreaction generally. This was a relief, ly for the time. He himself was an understanding but it was his duty to keep in the Service an who was still capable of performing his duties, at was all the treatment I got. Perhaps he was At any rate I knew nothing of psychiatry then, thing about treatment, which I assumed did not or my sort of trouble. Oddly enough, my surgical lid not suffer. If anything, I operated during this better than ever before or since, for it was the best f occupational therapy. Only at the very end of ar did I begin to feel unable to carry on, for once ce I had to get my anæsthetist to sew up for me; hough I am an atheist I several times prayed. an operation, for help in dealing with the life that my hands. Lack of occupation was the worst , and since periods of complete inaction always p in the Services they formed a recurrent terror. ng motor journeys from hospital and clinics over area were almost unendurable, as it was impossible anything but "sweat it out." Even reading, a standby, had become impossible. At any time ight be seized by the panic fear that, quite suddenly, hing in the outside world would go wrong, that ould begin to hear or see quite abnormal and ounds and sights; and sometimes these panic would become so acute that it was almost impos- to stop oneself running out into the road in flight this formless terror.

en I had been ill in this way for many months ature of the illness began to change. One can't being frightened for ever, and depersonalisation This, again, is difficult to describe to others. night best illustrate it, perhaps, by saying that it feeling of anonymity. I remember that I felt the time, and very acutely at some times. It ll so odd. I might be having a conversation with a or eating a meal, yet without any sense of my dentity or indeed of any identity. At such moments ht other human company desperately, for if others nised me and knew my name and treated me as son, then I must exist. Loneliness was unbearable, ortunately the unit had attached to it a Catholic who knew something of my sufferings and tried are my burdens. My heart goes out to him now ever I recall this period. But the depersonalisation ne worse and worse, and there was an acute stage , after three nights without sleep, a fundamental ation seemed to have taken place from the world other people inhabited. After that I lived, talked, acted, but I felt like a walking ghost. I *was* in limbo. Everything seemed to happen at one remove. Listening to the wireless, I first registered the sounds and then had to translate them. In London once, on leave, and looking into Lewis's window, I noticed a book entitled *Vertebrate Photoreceptors* and thought miserably what an accurate description of my own eyes this was, so little was I moved or interested by what my retinæ recorded.

And yet, all through this dreadful time, there was one in my mind who observed my derangement with detachment and with sanity, and I think this is what sustained me. Many times I thought of suicide, or longed for the help of religion. But I had no courage for the first or belief for the second. Though in the end I came to believe in my actual madness, the fact that part of my mind still seemed capable of critical comment saved me. Eventually I made a special journey to consult a psychiatrist who was an old friend, and was referred to a leading psycho-analyst, who made it clear quite casually that my illness was nothing exceptional, that I was far from mad, and that I could be cured by treatment as an outpatient. This was the first time I had ever even entertained the possibility of cure, and the effect was overwhelming. First I had to be invalided from the Service and then to find a suitably placed analyst, but after a couple of months these objects were secured and I began the strange, disturbing, but so rewarding process which lasted, with interruptions, for the next four years.

My analysis was conducted by a woman, and I was able to go on with a minor surgical job in the country; but it meant travelling 25 miles each way every weekday evening for the first few months. The financial burden was severe, though not, I imagine, as much as it would be today. This is no place to describe the process of analysis. It has its ups and downs, its periods of violent hatred or affection for the analyst—the negative and positive transferences, as they are called—and the times when we had to abandon it altogether for a time for lack of progress. But infinitely satisfying were the moments when intellectual understanding of the origin of a symptom fused with emotional acceptance to mark a step back to the real world, a step accompanied by a return of reality to the impressions my sense organs brought me. Now that I was in analysis and could talk it out, the fear of madness gradually receded, though it was another year before it became inconspicuous. At the same time my social behaviour became more unstable, freed from its previous rigid restraint. At no time did I stop working, and I accomplished with success many activities outside the purely surgical field.

Family life was difficult, of course, and my wife and children must have found it very trying at times. Looking back, I feel I owe my salvation first to a devoted wife and second to my analyst. What would have happened without these two I prefer not to think about. Now, cured and nearly a decade after falling ill, I occupy a busy, eminent, and satisfying position in my own field. I have moments when the shadow of a symptom returns, but now I can always detect for myself the immediate cause in some recent happening or incident. Above all, I would like to say here, analysis does not merely restore one to normal. It makes one normal for the first time. I feel now that I really understand life and living and that I have a real philosophy of life, and I wonder at the immature individual I used to be. I realise that neurosis is an untutored essay in self-analysis, and I have a profound contempt for the physical treatment, and particularly for the surgical treatment, of mental disorder. Above all, I have retained enough of my experiences to be able to remind my students and nurses that a neurotic's sufferings are real sufferings and his complaints genuine.

in weight. The rations and allowances for the schoolchild, including school meals, had not changed materially since 1945, and the proportion of children taking school meals had increased from 36·3 to 50·4% and that of those taking school milk from 73 to 87·5%. Hence the cause of the decline in weight is not clear.

In introducing this 24th annual report of a chief medical officer to the Ministry, Sir Wilson Jameson says that, as before, it is the work of many writers, named and unnamed. Dr. J. Alison Glover has again been editor.

Poliomyelitis

The number of notifications in England and Wales for the week ended July 30 was poliomyelitis 147 (96), polioencephalitis 22 (3). Figures for the previous week are shown in parentheses. Counties reporting more than one case (poliomyelitis and polioencephalitis together) were: London 20 (7), Bedford 2 (0), Berkshire 2 (3), Cambridge 2 (1), Cheshire 6 (0), Cornwall 8 (1), Dorset 2 (0), Durham 2 (1), Essex 8 (4), Gloucester 3 (2), Hertford 3 (1), Kent 3 (0), Lancashire 12 (8), Leicestershire 5 (6), Lincolnshire, Lindsey 4 (1), Middlesex 13 (11), Nottinghamshire 3 (1), Oxfordshire 2 (0), Southampton 7 (8), Suffolk West 4 (3), Sussex West 4 (1), Warwick 6 (1), Westmorland 2 (0), Yorkshire, East Riding 2 (1), Yorkshire, West Riding 21 (17), Denbigh 2 (0), Glamorgan 3 (0), Monmouthshire 2 (0).

The rise in notifications was considerable, and it is unlikely that a consistent fall can be expected yet. But it must be remembered that, in comparison with 1947, the rise this year has been irregular, and that in the corresponding week of 1947 there were 302 notifications of poliomyelitis and 34 of polioencephalitis. In 1947 the peak was reached in the week ended Sept. 6 (36th week): but notifications in the week ended Aug. 16 (33rd week) were almost as high, and there was a small recession in the two intervening weeks.

March Quarter

With its issue for the first quarter of 1949 the Registrar-General's Quarterly Return for England and Wales inaugurates a second century of publication. A note at the beginning mentions "an interesting social change" since 1849—namely, that "whereas in those days most marriages took place in the fourth quarter 'which follows harvest, includes Christmas, and is the marrying season in England,' and most births were in the first quarter, nowadays most marriages are in the third quarter and most births in the second."

Provisional vital statistics for the March quarter, 1949, show that the infant-mortality and stillbirth rates were again the lowest for any March quarter. The infant-mortality rate was 40 per thousand related live births, compared with 41 in the corresponding period of 1948 and an average of 64 for the first quarters of the ten years 1938–47. At 23·1 per thousand total live and still births the stillbirth rate was 1·3 lower than a year before. The live-birth-rate was 17·4 per thousand total population, compared with 18·7 in the March quarter, 1948. The death-rate of 15·0 per thousand represented an increase of 2·7 over the record low rate for the same period last year and was 0·2 above the average for the March quarters of 1943–47.

Population.—In the age-group 20–40 in the total population (including the Armed Forces) there is very little difference between the numbers of the two sexes (men 6,564,000; women, 6,541,000). From age 60 onwards the women outnumber the men by a million (women, 3,906,000; 2,910,000), and from age 80 onwards women are nearly twice as numerous as men (women, 412,000; men, 228,000). Persons under 20 years of age total 12,368,000; those aged 20 years and under 60 number 24,592,000; and there are 6,816,000 people 60 years of age and over.

Deaths in 1944

The last of the war-time arrears of the Medical Tables volumes of the Registrar-General's Statistical Review, that for 1944, has now appeared.[1] Those for 1945, 1946, and 1947 have already been published.

Disabilities

36. ANXIETY NEUROSIS—I

DURING the middle years of the second w I felt myself becoming increasingly uneasy sheltered occupation of a civilian surgeon, wa procession of house-surgeons and registrars c into the Forces. Eventually I volunteered, an a surprising amount of difficulty with my e and the authorities generally, managed to get of the Services in my own specialty. Looki now, I suppose this guilty urge to get into was the first symptom; at the time it seemed t thing to do, though I am a very domestic and always unhappy away from my wife and The first month or two of training and postin novel and exciting, like going to school for t time; and though, like everyone else, I had of being sent overseas and the risks this implie were not unduly magnified. Then I settled do a long and very comfortable posting at a Service h and without warning the thing struck me.

It is as difficult to describe to others what a anxiety state feels like as to convey to the inexp the feeling of falling in love. Perhaps the most teristic impression is the constant state of cause apparently meaningless alarm. You feel as if y on the battlefield or had stumbled against a wild in the dark, and all the time you are conversi your fellows in normal peaceful surroundings a forming duties you have done for years. W your head feels vague and immense and stuffe cotton-wool; it is difficult, and trying, to conce and, most frightening of all, the quality of your appreciation of the universe undergoes an change.

I found the visual disturbances most un Everything looked flat, two-dimensional, and I often used to stare at clouds and fields and w to come real again; and even now, cured an afterwards, these feelings of visual unreality lin I *recall that one of your peripatetic corresp* once wrote about the bitter complaints of his n that everything looked like a theatrical backdr is an accurate description. After vainly trying back to normal seeing, and getting refracted improvement, I noted similar changes in the senses. As the long humid summer days drag with their loads of terror and obsession, hear became dulled, and I wondered if I was drifti some limbo a stage removed from the outside Always, at every waking moment which was not o with some urgent and difficult task, my mi haunted by the thought, first that I might be mad, later that madness was only a matter o In the end, after a year of this, with mental distu of an unpleasant nature which will be mentione moment, I firmly believed that I was in fact ma longed only to get home for a few last weeks w family before the end. Another disconcerting times terrifying symptom was a loss of control o thinking processes, and the intrusion of though images of apparently spontaneous origin. T itself became verbalised, which it had never been l and grotesque and frightening images, often of hallucinatory intensity, appeared. These were acute in the drowsy pre-sleep period; but for m I was able to sleep soundly without dreaming through the miserable days I longed for the nig release. I managed to do without any drugs for the whole of the year, and then, when sleep too to fail, I had recourse to 'Medinal.' The atmo

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[1] Registrar-General's Statistical Review, 1944, Tables Part I (Medical). H.M. Stationery Office. Pp. 324. 5s. 6d.

Letters to the Editor

THE R.M.B.F.

-For the first time in the history of the Royal Benevolent Fund, the chairman's report is nt to every member of the profession in England, d, and Wales. The committee has felt justified g this step as the fund is essentially the profes- wn Benevolent Fund and all members of the on should be informed of the useful and valuable hich is being done to alleviate the distress which ithin our own ranks.

all your readers to consider the report as one of l importance and to help the work to be continued true spirit of brotherhood by giving generously e who are in adversity.

Fund receives much help from many, but to who are not subscribers I make this appeal: e support your own Benevolent Fund by a sub- n, large or small. Help to make the Fund of our great and noble profession by having sonal support of every medical practitioner."

Medical Benevolent Fund,
lliol House, Manor Field's,
London, S.W.5.

WEBB-JOHNSON
President.

OSTRACISM OF THE TUBERCULOUS

—Recent correspondence shows the need for a true iation of the part played by the tubercle bacillus community.

are desperately short of industrial man-power, and the important age-groups 15–50, tuberculosis is ly responsible for a mortality far greater than that any other disease. This severe, and recurrent, nic loss, according to a prediction of the Royal ission on Population, may become even greater. umber of young adults, aged 15–40, is likely to e by 1,400,000 over the next fifteen years!

majority of new cases of phthisis are being diag- in a stage too late for effective treatment; and of all deaths from pulmonary tuberculosis through- ne country, half are still occurring within a year of ation. Delay in diagnosis leads to: (i) death of atient; (ii) spread of infection, and further cases erculosis: and (iii) blocking of scarce beds with iced cases. The refusal of general hospitals to t cases of phthisis is largely responsible for the it unsatisfactory position. Success in our fight st this disease will only be won by the combined s of a team. The general practitioner, as the ator of diagnosis, is the most important member is team. Thousands of young postgraduates, how- are entering practice with little experience of culosis and no appreciation of the clinical features ly disease. As Dr. Foster-Carter says, "the teaching tals, in particular, should set an example to others." mportance of the disease to the community warrants llocation of a proportion of available beds in every eneral hospital.

der the direction of Dr. H. Joules, the experience he Central Middlesex Hospital has shown con- vely that, with adequate precautions, as stressed by nell, it is quite safe to nurse patients in tuberculosis s in a general hospital. Patients suffering from active onary tuberculosis are admitted to the tuberculosis is from the Willesden Chest Clinic. Emergency are kept free in the male and female wards, and these are transferred immediately any *open* cases of rculosis from the general medical or surgical wards. h cases are consistently found in every general ital and are largely responsible for the infection usceptible nursing staff.) Mantoux-negative nurses not allowed to work in the tuberculosis wards. The beds are adequately spaced, with free ventilation; floors are oiled; and nursing staff must wear masks and gowns while making beds and attending to patients. Sputum pots are handled by porters and cleansed in steam sterilisers on the block. Both the Mantoux conversion-rate, and the incidence of tuberculosis, amongst nurses at the Central Middlesex Hospital are thus kept well below the average for a hospital of this size. Lastly, there is no feeling of ostracism in the patients, who, together with the medical and the nursing staff, gain substantially from coöperation with other departments of the hospital; and practitioners of the area are encouraged to feel that early diagnosis will be followed by prompt treatment.

The advent of B.C.G. will not obviate the constant need for such precepts in the future!

Willesden Chest Clinic,
London, N.W.10.

C. H. C. TOUSSAINT.

SPLENECTOMY AND THE HÆMATOLOGIST

SIR,—Disputation concerning terms is seldom fruitful; but words have their uses, which I feel are abused in your leading article of Aug. 6, when you first categorically state that "the hæmatologist, on whom these surgeons rely, is not a clinical pathologist" and then proceed to define the said hæmatologist as a "clinician who is capable of making his own assessment and if necessary a personal interpretation of the hæmatological data and material." This I submit, Sir, is a very perfect definition of the clinical pathologist: it is the end to which all present training in clinical pathology in this country is directed and the aim of all those making through it their approach to medicine. The terms "hæmatologist" and "clinical pathologist" are not, as you appear to imply, incompatible.

The Royal Hospital, Wolverhampton.

S. C. DYKE.

HEARING-AIDS

SIR,—On the face of it, and to those without serious knowledge of the subject, your article last week on hearing-aids would appear to be a reasoned essay, and presumably an attempt to answer the leaflet published by the hearing-aid advisory committee of the British Association of the Hard of Hearing, of which I was the author.

You say that steps have already been taken to meet some of the complaints about the 'Medresco,' but the point at issue is that with all the modern knowledge of hearing-aids there should never have arisen any cause for such complaints. To produce, for instance, such an ugly ridiculous thing as the "plug-in" type of attachment for the earpiece, with its rubber nipple, when a standard moulded insert, made in many sizes, was available at the low figure of 1s. 9d. each, was surely the height of folly. These plug-in types are still being issued with the promise of a moulded earpiece at some distant date. Many people issued with the plug-in type are buying the standard moulded type as a temporary measure against the time when they are properly fitted.

Then, surely, a test by an experienced user of hearing-aids as they came off the production lines would have prevented many thousands of faulty aids reaching the hospitals to waste the time of exasperated hospital technicians.

Before the introduction of the medresco, clinics were careful about issuing an electrical aid to cases of nerve-deafness: now these appear to be issued indiscriminately. Fortunately I do not suffer from nerve-deafness, but, since I mix with the hard-of-hearing, I am able to study the reactions of a people suffering from severe nerve-deafness. In most cases, all they get is a tremendous increase of general sound, and, although they are able to hear someone speaking, are unable to pick out the words. The general increase in noise cannot be helpful to them,

In England Now

A Running Commentary by Peripatetic Correspondents

It was intolerably hot and the carriage was full. The train dragged slowly along, stopping at short intervals as if to mop its brow. Conversation turned on the advantages of possessing a pair of seven-league boots. In the circumstances unanimity might have been anticipated, but a beady-eyed little man in one corner—I noticed that he had pointed ears—came down sharply on the other side. "With all respect, gentlemen," he said, "have you seriously considered the arguments against?" Some of the more somnolent woke up and stared at him glassily but with faint interest. "You see," the little man went on, "the trouble with these boots is that you have to go seven leagues at every stride and that may be inconvenient. If your destination is twenty-one miles away, or any multiple of twenty-one, you are, I agree, on velvet. But suppose you want to go to a place *less* than twenty-one miles away, or somewhere more distant which is not a multiple of twenty-one miles away. You have to make a complicated zig-zag cross-country journey. What is more, you must work out your mileage accurately before you start. And there are worse dangers. I once had a friend who owned a pair of these boots. It is a sad story. He wanted to walk from Land's End to John o' Groats but he miscalculated the mileage. The unhappy result was that his last stride took him a mile out to sea and he was drowned."

The train creaked into a station and jolted to a stop. "Poughill!" shouted the guard. The little man jumped to his feet. "I get out here, gentlemen," he said. "Good-bye." He nodded pleasantly, waved, and disappeared through the closed door.

"Poughill," said somebody. "What a curious name."

"Yes," said a bearded scholarly-looking man in the far corner. "It's a corruption of Puck's Hill," you know.

* * *

The B.M.A. holds a nice little party every year, but it is chicken-feed compared to the annual congress of the A.M.A. in Atlantic City. The city itself must be unique. Along its beautiful sands stretches the famous wooden "boardwalk"—for 8 miles. It is hot walking, so you can be pushed gently along this in a little wicker chair by *a perspiring darkie, if you've enough dollars.* Alternative methods of transport were suggested by a hire advertisement for "bicycles, tricycles, and bi-sexuals." Inquiry proved the last to be a local colloquialism for the tandem. The rest of the city consists of the booths and shops which line this celebrated thoroughfare; the many piers (Steel pier, Million-dollar pier, &c.); some hundred of hotels, ranging from the super to the squalid; and the largest convention hall in the world, into which 20,000 people can on occasion be packed. There are of course some other buildings, which include the continent's largest sea-food restaurant (3200, excluding our party, were dining we heard!), and perhaps a dozen score of churches and chapels, lying in wait presumably for repentant visiting sinners. An alternative measure of dealing with this problem appears, however, to be provided by the unusually heavy armament carried by the local police. The economic life of the city seems to be cleverly balanced between the "Blackpool" component, which carries it through the summer, and the *conventions and* congresses, dear to the male American heart, which keep it populated throughout the rest of the year.

On our way to the hall to register—it was Sunday morning—we were edified to observe an aeroplane flying low along the shore, trailing a banner with what seemed at first the strange device "K.O.V.D." (Knock Out V.D.!). This was followed by another which more [illegible] ommended us to buy and use —'s [illegible] Later in the day they wrote "happy [illegible] ke.

We attended, together with 15,000 other doctors and wives, the new president's speech of welcome. The dais was backed with an enormous reproduction of Sir Luke Fildes's picture "The Doctor," with a caption advising us [illegible]fos part of the no-socialised-medicine campaign—to "take politics out of this picture." We sat up as the president led off by informing us in stentorian tones that his young and virile nation is in need of no outworn relics of the effete social system favoured by decadent so-called democracies. This seemed good so we stayed; but the rest was just ordinary p stuff. The madrigal singers, who had been much and who were to have followed him, did not ap there were some more speeches.

The exhibition itself was like our own Medical tion but on a colossal scale. There were also differences—for instance, the glamorous coll live semi-nudes who reclined on a beach fl U.V.L.; I think they were advertising a Miami or something. Then there was the large car which a drug-house will present to the who writes the prescription with the lucky num the ensuing year. The alcohol-ometer (for home use). The naval captain and army colonel who over a joint Service exhibit, each with a 'C bottle and straw in hand. The queues of thirsty waiting for a "handout" of babies' orange- next door of 'Camel' cigarettes. Upstairs one clinical demonstrations from a Philadelphia h the colour television screens, or hear high- lectures on diabetes, arthritis (including Com and cardiac failure. Out of hours hospitality was and we were made extremely welcome. To coin a a good time was had by all.

* * *

"And what do you think of the Health doctor?" is still, apart from the "What is really with me?" type, the commonest question we get nowadays. The possible answers are many, but saves sending in bills" seems as good as any. It a joy not to have to settle down the last week of quarter to send out a few hundred accounts. methodically minded it may be simple enough, people like me who are invariably about 12 weeks in their entries it isn't much fun. What n Victoria Road is Mrs. Jones? I suppose I t would never forget her address, but it's gone and I go inquiring at all the front doors in the street for a wearing a glass eye who hasn't paid her bill. Wh, I charge Mrs. Smith 7*s.* 0*d.* for one visit and 10*s.* the next? Perhaps the latter was a night call or it was really my own exasperation. Anyhow it's ago and I've forgotten. Yes I'm glad bill-sen over. Come to think of it, the actual *mention* of cash seems taboo now we are Bevan Boys. We innumerable forms. We may even write " service" on our maternity accounts, but figures discreetly left out. Perhaps that is why our q cheques with the higher mathematical sum accompanies them are still a bit incomprehensible average G.P.

* * *

I shall be a lot more sympathetic with my de patients in future. I have just undergone an ex traumatic experience and show all the cha symptoms of reactive depression. I have a de expression and appearance, complain of a lowe spirits, cannot concentrate on my work, and difficult to respond quickly to a stimulus—a sy known as psychomotor retardation. All these sym are subjectively appreciated as a continuous preoc tion with painful thoughts. Though I do not feel su life appears stale and profitless; so I can really stand why people can be tempted to end it. The c fulness and silly laughter of others seems unreal, their sympathy is a mockery and brings no comfor may ask a colleague to give me an ether abreaction this treatment, the people who are the cause of misfortunes would be presented to my mind in s manner that I could express fully my feelings of sion towards them. If all went well, this would my symptoms. But on second thoughts I might as wait until the results are out, and anyway I can another shot in six months' time.

* * *

The anxiety of some of us about grading, awards, and so on recalls to my mind that in 158 pay of a surgeon in the Royal Navy was 15*s.* a m raised in 1602 to 20*s.*; that the trumpeter drew the pay as the surgeon; and that the smaller ships given the choice whether they would carry a surgeo a trumpeter—they could not have both.

s, senior medical officers, and junior medical ; to the plain man it would seem possible to hese factors into a simple system of three groups, th its own salary scale, thus—

nsultants and medical superintendents ;
ecialists and senior medical officers ;
gistrars and junior medical officers ;

se are the analogous grades in the two original s.

, then, was this not done? The answer is an ; but a dismal one: because it would not have n accordance with the professional values of At the moment the voluntary-hospital system e ascendant, and voluntary-hospital ideals prevail current assessments and gradings, in the vaunted ance of medical counsel and the denunciation of l control, and in the endeavour to degrade the l superintendent. Nevertheless, eventually, the uthority system will succeed: because it has been ed in the vice of official demands, tested and proved furnace of official needs and requirements; because tional Health Service, when all is said and done, fficial, and not a voluntary hospital, service—and s its destiny. Wise, therefore, should we be to n the medical superintendent and the consultant qual and co-extensive, similar though not identical. would we? I wonder.

A Local Authority Officer.

LACRIMATION AND MICTURITION

—Dr. Vernon R. Pickles's communication (July 9) the association of lacrimation and micturition, niniscent of the euphemistic "shedding a tear," ts me to say that for years it has been my practice k all patients suffering from epiphora, not if rition had been disturbed, but—so fruitful has he inquiry—what particular form it took. Polyuria ncreased frequency, of course, are the usual com- s, but idiosyncrasies vary; the symptoms may be , and questioning demands insight and sympathy. n intuitive methods, though based upon long years servation, cannot be commended scientifically, and not prepared to formulate rules.

er all, the association should not be surprising. ickles does not give the sex of his case, and tells othing of his subject's personality—an important ion where these functions are being discussed, the commonest cause of lacrimation is emotion. may or may not be conscious and produces variable ts according to age; years bring a taboo. Hence, ips, the apparent rarity of the phenomenon recorded r. Pickles. The effect of emotion upon the secretion ine is also well known. In some mysterious way may account for the modern avoidance of the ed onomatopœic word "piss," which nevertheless ound biblical sanction. Present-day children wee- it needs only the addition of a "p" and they d a tear." May I go further and urge the desirability nsidering to what extent lacrimal obstruction may psychogenetic origin? But that is a far "cry."

Greece curative weeping is practised for con- tivitis, and according to Dr. T. Stephanides,[1] n tears fail to deal adequately with this and other itions the eye is bathed with fresh urine from a cow. universal foster-mother becomes a pharmacy. I am not quite sure that the alternative "fresh leaves pounded into a mortar and placed as a press on the eye" is not bringing the same ideas into ionship; the product, often suggestively pale w, of the vine is notoriously provocative of tears urine.

rtsmouth. W. S. Inman.

LIVER EXTRACTS IN PERNICIOUS ANÆMIA

Sir,—I do not propose to reply to all the points raised by Dr. Ewing in his letter of July 23, but I would like to call attention to one or two.

In the first place, there seems no doubt that liver extract resembles insulin and many other biological products in that certain patients respond better to (or are less worried by side-effects of) the products of certain manufacturers, apart altogether from the measurable therapeutic potency of the extract in question.

Dr. Ewing seems to imply that American liver extracts are, in general, more effective than those manufactured in this country, and that this is due to their being prepared from "fresh and healthy liver." Perhaps, however, his attention has not been drawn to an article by Rickes et al.[1] in which they report the results of their estimations of vitamin B_{12} in six American commercial liver extracts for parenteral use made by four different manufacturers. These extracts show a variation in B_{12} content, between 1·2 and 14·0 microgrammes per millilitre, although all were claimed to contain 15 *U.S.P.* units per millilitre. In another paper, by Haden and Bortz,[2] the clinical potencies of 15 *U.S.P.* unit liver preparations made by different American manufacturers are said to show wide differences. I understand that a paper will be published in the near future in which similar results of the assay of vitamin B_{12} in British and American commercial extracts will be compared and similar differences shown.

Dr. Ewing's suggestion that the opinions of representatives of commercial houses manufacturing liver extract in this country on the satisfactory nature of the livers from which their extracts are made would be neither competent nor disinterested, strikes me as curious. Surely the commercial firms would do everything in their power to obtain a raw material satisfactory for their purposes!

Weldon Dalrymple-Champneys.

Ministry of Health, London, S.W.1.

PREGNANEDIOL IN URINE

Sir,—The observations made by Dr. David Stern at the Congress of Obstetrics and Gynæcology, and restated by him in your issue of July 30, were, I thought, of considerable interest. But for the lengthiness of the congress discussion, no doubt the introducers would have been afforded an opportunity for response, in which case I would have said then, inter alia, what I propose to suggest now.

If the constancy of pregnanediol output per hour (over short periods) as found by Dr. Stern, and its close correlation with the 24-hour output, can be confirmed, then clearly an important point will have been established. For such confirmation both his own further investigations (for he admits that his series is as yet too small to justify publishing figures) and those of others will be necessary. I am doubtful, however, as to whether the value of this demonstration will be as great from the practical as from the theoretical aspect, since utilisation of the principle would involve the accurate noting by the patient (in the case of an outpatient) of the time when the bladder was last emptied before the specimen was collected, as well as the time the actual collection was made; and in addition the collection would have to be the entire bladder contents. Neither of these requirements would seem to be prohibitive, but my own experience of the results of requests to patients to follow even simpler instructions leads me to conclude that imperfect collection, or inaccurate recording of times (or its omission altogether), are not unlikely; and this would and this can be observed by their movements in continually raising or lowering the volume of their aid, or, in fact, eventually switching off and resorting to lip-reading and immediately being able to understand what is said.

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[1] *Lancet*, 1949, i, p. 115.

[1] Rickes, E. L., Brink, N. G., Koniuszi, F. R., Wood, T. R., Folkers, K. *Science*, 1948, 107, 396.
[2] Haden, R. L., Bortz, D. W. *J. Amer. med. Ass.*, 1948, 138, 870.

Your article states that the B.A.H.O.H. estimate the need at 150,000; this is not the case, the estimate was given by the Ministry of Health, and indeed it is a mystery how they arrived at this figure. It will be surprising if the eventual figure is not nearer the 500,000 mark.

We are asked to view the situation in perspective, although what is meant by this is not quite clear, and the statement is made that "it is a waste of time and money to give people aids without at the same time giving them proper training in their use." With this we heartily agree, but *unfortunately that is exactly what has been done from the very commencement of the issue of medresco:* no training whatever in the use of aids has been given, and therefore this cannot be used as an excuse for delay. You admit that there is a crisis, and state that one clinic has had to close the waiting-list with little prospect of opening again for nine months. It can be added here that the waiting-lists for repairs are beginning to reach the lengths of those for new aids. One year, or two, or even more is a long time to wait for an aid when you are old, for you may be dead before you get it, or thrown, unknowledgeable and unprotected, on to a seller's market to become the victim of unscrupulous advertising. Instead of protecting the hard-of-hearing against exploitation, the present chaotic position is doing exactly the opposite.

What has transpired since July 5, 1948? The annual budget for the hearing-aid side of the health service is £5,000,000. In the first year some 27,000 hearing-aids were issued, and according to answers in the House of Lords and the House of Commons on May 10, over 19,000 had then been issued and 7000 had been either found to be unsatisfactory or require repair. Again according to *Hansard,* at that time some 41,000 had been manufactured; what has happened to the odd 14,000 of this model called mark I is, as yet, unknown. It is almost certain that the whole of the first issue will eventually find their way to the scrap-heap because so many recipients are having to return them frequently for repairs.

We are also told, in *Hansard,* that an order for 100,000 of the new type called mark II has been placed. Some of the recipients are already complaining that this model, which is of the magnetic type, is not as powerful as the previous crystal type; and according to one hospital technician, quite a number of the earpieces have developed a fault within a short time of issue.

To supplement the present very inadequate service I submit that, after competent medical examination, the hard-of-hearing be allowed the alternative of a grant of, say, £10 towards the cost of approved commercial aid. These are guaranteed for one year; so that, for the first year, all those choosing this method would not be a liability on the National Health Service. For the following four years any repairs up to, say, a limit of £3 per year should be paid for by the service. Then, at the end of five years from the date of the first grant, a further grant should be allowed. Added to this there is also the cost of batteries; these are free to users of the medresco, and an equitable amount should be allowed to those using a commercial hearing-aid.

The Ministry of Health have, so far, maintained that any system of grants would not be an economical proposition. Unfortunately they do not give any figures regarding the cost of medresco, including the cost of repeated repairs, so that it is impossible to make any comparison.

As you reiterate, careful training in the use of a hearing-aid is essential with any type of aid; unfortunately this training has not so far been given. Experienced users of hearing-aids are prepared to u this task and it is to be hoped that the Ministry of will do something about this very important side service.

H. B. Read

460, Staines Road,
Twickenham.
Hard of Hearing

GRADING AND DEGRADING

Sir,—In the House of Commons recently, to a question on the grading of hospital medical the Minister of Health said:

> "It is wrong to speak of demoting. This is time that grading has been done; therefore there no demoting from a superior to an inferior grade."[1]

The Minister's statement, however, is not quite co because the local authorities' system of grading medical staff was in existence before the National Service; and (2) because the N.H.S. gradings —some say *intend*—definitely to demote medical tendents.

In what were recently local-authority hospit today constitute the majority of hospitals in the the classification of hospital medical staff in use contained the well-known grades of medical tendent, senior medical officers, and junior officers. In the Minister's classification, as pu in the Terms and Conditions of Service, the authority grades of senior medical officer and medical officer reappear as "senior hospital officer" and "junior hospital medical officer"; the medical-superintendent grade, which, correspon might have appeared as "chief hospital medical o is not represented as a separate and definite instead, medical superintendents are to be r in a variety of ways—namely, as consultant, or S.H or J.H.M.O.; or, perhaps, as part-time-consultant time-secretary, or part-time-S.H.M.O.-part-time-sec or even as part-time-consultant-part-time secretary, or part-time-S.H.M.O.-part-time-assistant tary; or, quite possibly, indeed, very likely, as time-J.H.M.O.-part-time-assistant-secretary: a sad fusion of terms arising out of a sadder conf ideas concerning the functions of these local-a medical officers.

Accordingly, a medical superintendent may himself graded as S.H.M.O.—and already many superintendents have been so graded—which, if it anything at all, means a definite demoting: for w before the grading, he was the chief medical o his hospital, he is now one of its senior medical and, it may be, lower in hospital status and in scale than his own deputy or one of his assistant m officers who has been graded as a consultant.

To maintain, therefore, that no demotings occurred, nor can occur, is to declare oneself, to say least, as strangely oblivious of existing facts and c happenings.

The Minister's classification appears to be the of an attempt to fuse two ideally different syste grading hospital medical staff—namely, the volun hospital system, based on the efficiency of counse the local-authority system, founded on the sufficie control. On examination, however, the new classifi is discovered to be not so much a fusion as a confu these two systems.

Yet, counsel and control are not incompatible it should be possible to achieve a satisfactory syn

The primary elements in the voluntary-hospital are consultants, specialists, and registrars; corresp units in the local-authority system are medical su

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[1] See *Lancet,* July 23, p. 176.

ONAL HOSPITALS' CONSULTANTS AND SPECIALISTS ASSOCIATION

I should be grateful if you would announce e above association has instituted associate ship for those medical practitioners in the service :

ho are graded as registrars by a regional board ;

ho hold a post of registrar status, whether that ecognised by a regional board or not ;

ho, in the opinion of council, are of similar status.

membership fee is 10*s*. 6*d*., payable on joining rying associate membership until the termination calendar year next after the date of joining. te members will have representation on the committees of the association but will have no Further information should be sought, by pros- associate members, from the following regional atatives :

ewcastle :	Mr. R. E. Jowett.
eds :	Mr. Donald Watson, Mr. A. R. Lister, Mr. R. R. Simpson.
effield :	Mr. L. Dougal Callander, Dr. J. W. Brown, Dr. P. H. O'Donovan.
ast Anglia :	Mr. J. M. Ridley Thomas.
.W. Metropolitan :	Miss A. H. Baker, Mr. C. Hope Carlton, Mr. A. Clifford Morson, Mr. Harold Dodd.
.E. Metropolitan :	Dr. F. Murgatroyd, Mr. J. B. M. Green, Dr. R. B. Niven.
.E. Metropolitan :	Mr. J. R. H. Turton, Mr. I. Monro Robertson, Dr. H. A. Treble, Mr. T. Meyrick Thomas.
. W. Metropolitan :	Mr. Nigel Cridland, Mr. N. Ross Smith, Mr. H. S. Taylor-Young, Mr. G. N. Golden.
outh Western :	Mr. C. E. Kindersley, Mr. L. Henry, Mr. W. H. Bradbeer, Dr. F. D. M. Hocking.
Velsh (North) :	Dr. H. S. Bell.
Velsh (South) :	Dr. W. Esmond Rees.
irmingham :	Dr. A. I. Cheyne. Mr. B. G. Scholefield.
lanchester :	Dr. F. M. Hilliard. Dr. Hugh Selbourne.
iverpool :	Mr. A. W. Holgate.

incoln's Inn Fields,
ondon, W.C.2.

NIGEL CRIDLAND
Hon. Secretary.

MEMORIAL TO SIR JOHN FRASER

—There must be many who would be eager to bute to a memorial to Sir John Fraser, Bt., the late pal of the *University of Edinburgh. These would* e his old students, his patients, and all those who he pleasure of working with him in the course of any public duties to which he gave himself so ringly.

h the consent of Lady Fraser and her family, a committee has been formed to receive donations und for this purpose. The form which the memorial take is a matter for suggestion and discussion; felt, however, that the income of the fund might plied in the provision of a scholarship, prize, or grant to be awarded annually to some young on or surgeons of promise.

ntributions, which should not exceed ten guineas, d be sent to Mr. John Bruce, C.B.E., F.R.C.S.E., rtment of Surgery, Teviot Place, University of burgh, not later than Dec. 1, 1949.

EDWARD V. APPLETON
F. E. JARDINE
J. M. GRAHAM
JAMES LEARMONTH.

nburgh.

Obituary

HENRY HORSMAN McNABB

M.D. MANC.

Mr. H. H. McNabb, consulting surgeon to the Royal Eye Hospital, Manchester, died on July 28 at the age of 74. Born in Bolton, Lancashire, he graduated from the Manchester medical school in 1898. After a resident appointment at Monsall Fever Hospital, he became junior house-surgeon at the Manchester Eye Hospital, and he remained there on the resident staff for about four years. He was then appointed honorary assistant surgeon, and in due course honorary surgeon. In 1940, when he retired to the consulting staff, the board of management paid high tribute to his long service, and gave him freedom of the hospital beds for his patients.

T. M. B., a colleague of forty years' standing, writes : " I have never seen a finer technician in the art of ophthalmic surgery than Harry McNabb. He had beautifully dextrous hands which he could turn to operate in any position, and to any experienced ophthalmic surgeon it was an eye-opener to watch the skill with which he performed the most difficult intraocular operations. His colleagues, who are always close critics of a fellow surgeon, never disagreed that he was the premier operator of his period, and his many visitors from home and Continental clinics always paid enthusiastic tribute to his skill. His clinical sense was high : there has always been a tradition at the Manchester Royal Eye Hospital that any difficult case should receive the opinion of all members of the staff, and his view was much valued on these occasions.

" Occasionally he wrote in ophthalmic journals, but he was never a prolific writer, because, I think, he rather disliked any form of publicity. He always attended meetings of the Oxford Ophthalmological Congress, enjoying the discussions and perhaps even more the universal comradeship. He always took the greatest interest in the North of England Ophthalmological Society, of which he was an original member, and he became president in 1927.

" In his younger days, McNabb was a keen cricketer, being a useful batsman, and a good spin bowler. He was a member of the Manchester Racquets Club, and he also played tennis. In his own house, where he entertained many distinguished English and foreign ophthalmic surgeons, he was a delightful host. For some 20 years he had borne intermittent ill health with great fortitude, never complaining, and continuing his work almost to the last. A man without enemies, he will always be remembered by his friends as one truly kind of heart."

Mr. McNabb married in 1915 Miss Bywater. They had two sons, the elder of whom died young. His younger son is now an officer in a Scots regiment.

RALPH PEMBERTON

M.D. PENN., F.A.C.P.

Dr. Ralph Pemberton, professor of medicine at the graduate school of medicine of the University of Pennsylvania, had been president of the International League against Rheumatism since 1938, and it was a great disappointment to his fellow members that illness prevented him from attending the congress held in New York this summer. They heard with regret of his death on June 17 at the age of 72.

Pemberton was born in Philadelphia and graduated in medicine at the University of Pennsylvania in 1904. For the next four years he held internships at the Children's Hospital, the Pennsylvania Hospital, and the Philadelphia General Hospital. During these early appointments his interest in arthritis was aroused. The award of a Woodward fellowship in 1908 enabled him to study the dynamic pathology—as he termed it—of this disease : working with J. E. Sweet at the Pepper laboratory he investigated the inhibition of pancreatic activity by extracts of suprarenal and pituitary glands. Two years of postgraduate study at Berlin and Strasbourg further widened his experience, and when, after the 1914–18 war, during which he served as a major in the Medical largely negative the value of this innovation. In the case of inpatients, there seems to be no good reason for not using 24-hour collections if one wishes to record the 24-hour output.

The objections mentioned above may or may not hold good; on an entirely different basis, however, is the now very considerable evidence, from widely differing sources, that pregnanediol excretion, even when measured in terms of 24-hour outputs, can vary to such an extent as to reduce the clinical value of its measurement to a low level *except in special circumstances*. As I pointed out at the Congress of Obstetrics and Gynæcology, it appeared improbable that this state of affairs could be ascribed entirely to technical inadequacies, while at the same time there were no solid grounds for believing that pregnanediol excretion at all closely paralleled the production of progesterone (as had been shown most convincingly by Professor Marrian in his paper at the congress). I would reiterate now, what I suggested then, that a simple direct method of estimating the blood-progesterone would surely supply evidence of much more clinical value than could ever be expected from the pregnanediol excretion in the urine.

Obstetric Hospital, University College Hospital, London, W.C.1. G. I. M. SWYER.

PREVENTION OF BURNS AND SCALDS

SIR,—I read with interest the paper by Dr. Leonard Colebrook (July 30), which has had considerable publicity, including a leading article in the *Manchester Guardian*. I was surprised to find that it makes no mention of the activities of the professional fire brigades in encouraging fire-protection methods in the design of domestic appliances and better appreciation of fire prevention amongst members of the public.

Under the Fire Services Act, 1947, every fire brigade is *responsible for giving, when requested, advice in* respect of buildings and other property as to fire prevention, restricting the spread of fire, and means of escape in case of fire. Many fire brigades are actively concerned in carrying out propaganda and publicity towards this end, and I should like to congratulate Dr. Colebrook and your journal on publishing this article. We hope that, together with the efforts of the professional fire brigades, it will bring home to the public the constant source of danger which exists in every home and the number of avoidable deaths which are caused year after year through neglect to take reasonable precautions.

Fairfield Street,
Manchester, 1.

K. N. HOARE
Chief Officer,
City of Manchester Fire Brigade.

TESTICULAR PAIN

SIR,—Dr. MacDougall's account of the somatic nerve-supply to the testis is accurate; it strictly agrees with Gray's *Anatomy*. The visceral nerve-supply is not absolutely agreed on by all anatomists. In so far as he includes the renal and aortic plexuses, and therefore additional spinal segments, he merely argues my point with greater eloquence than I do. For my point is that testicular pain cannot be localised to a single invariable spot (point B, fig. 3 of Mr. Brown's article), whether its path be along visceral or somatic or both sets of nerves.

As he says, the tunica vaginalis is presumably innervated from the overlying somatic nerves. My own view is that the ilio-inguinal nerve is responsible most of all, because its course betrays its elongation as the tunica vaginalis descends into the scrotum; also, pain is not usually referred along the perineal nerves. What Mr. Brown actually calls "tunica vaginalis pain"—i.e., the testicular pain of the intact body—Dr. MacDougall would therefore assign to all the scrotal nerves. In this he unwittingly and fundamentally differs from the view he set out to defend—namely, that the genital nerve alone is wholly responsible.

As pointed out before, stimulation of the femoral nerve at the point where the ureter cr cannot possibly explain the descending nature of pain any more than a station-master at Newca see all the Flying Scotsman's movements between and Edinburgh. Testicular retraction in calculus o tion by no means refutes this. The motor are stimulated reflexly, not directly; so it is to adduce testicular retraction as evidence of nerve stimulation.

East Barnet, Herts. FELIX E. W

POLIOMYELITIS OR LEPTOSPIROSIS?

SIR,—It is said that many cases of anterior myelitis may be expected this autumn. Hence we should be noted that the meningeal form of lept closely resembles mild poliomyelitis without Infections with *Leptospira icterohæmorrhagiæ* *canicola* are being recognised with increasing in this country, and many of these cases occur autumn.

The possibility that the meningitis may be *L. icterohæmorrhagiæ* should be considered if the has bathed in stagnant fresh-water, or if he is to come into contact, at work, with water which contaminated with rat urine. Contact with a would suggest the chance of infection with *L. c* The diagnosis can most easily be confirmed by the patient's serum for the presence of lept anti-bodies, which first appear about the of illness. Unfortunately, laboratory diagnosis usually practicable in the earliest stages of the dise

Other forms of meningitis may resemble poliom and bacteriological examination of blood or spinal fluid can detect the responsible micro-org or virus in many instances. As regards poliomy the diagnosis by laboratory methods cannot al assured in mild cases.

If leptospiral meningitis is the correct diagnos prognosis is improved, because death and perm disability are almost unknown. In addition, thi nosis removes anxiety about poliomyelitis deve in the patient's neighbourhood.

Group Laboratory,
Archway Hospital, N.19. J. M. AL

Leptospira Reference Laboratory,
Wellcome Research Institution, N.W.1. J. C. BRO

MALE TOADS IN PREGNANCY TESTS

SIR,—As the letter from Professor Bach and Dr. S (July 30) may prove misleading to those who di see the previous letter by Bach et al,[1] we should to point out that their series of 610 tests was app performed on *Rana esculenta*, not on *Bufo bufo*. only reference to the latter species was the statement "though we have found it [bufo] equally satisfa for the purpose . . . we have used the edible frog, *esculenta*."

Bach and Szmuk say further that "*R. esculent* proved more sensitive, giving a positive result with 10–12 units of gonadotrophic hormone." This is from Bach et al.[1] who did not mention any gonadotr level for *B. bufo*. Our finding,[2] that this specie give a positive response with 8 I.U. of chorionic trophin, has since been confirmed, but the sul under further investigation. Bach et al. quoted Mainini's results obtained on the giant South Ame *Bufo arenarum* Hensel, where the threshold was 40 units. One would expect the much sma *esculenta* to have a lower threshold than this.

Physiology Department, St. Mary's
Hospital Medical School,
London, W.2.

J. F. D. FRAZE
F. X. WOHLZOG

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1. Bach, I., Szmuk, I., Robert, L., Klinger, B. *Lancet*, 1949,
2. Frazer, J. F. D., Wohlzogen, F. X. *Ibid*, July 16, p. 13

ented by a Mr. Monaghan of Denver, weighs only permits the patient to walk about and feed himself. s of a rubber-plastic plate held in position over the chest. A small chamber inside the chest-plate iflated and deflated intermittently by a pump, the which can be operated from the electric mains or ttery (the dimensions of which are not given) lasting four hours.

MEMORIAL TO ROBERT WILLAN

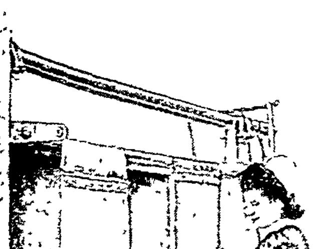
day, Aug. 12, a tablet is being affixed by the London ouncil to No. 10, Bloomsbury Square, in memory Robert Willan (1757-1812). Willan was appointed to the public dispensary opened in Carey Street, coln's Inn, in 1783. In his *Description and Treat- utaneous Diseases*, published in parts between 1797 8, he established a nomenclature of skin diseases still more or less in use today. He lived at No. 10 0 until shortly before his death.

LIGHTING OF BUILDINGS

luminating Engineering Society's *Code for the Lighting ing Interiors* is a set of rules and recommendations both natural and artificial lighting for all types of s. The society, whose membership includes repre- es of the lighting industry and users of light, says recommended values of illumination are in general han those recommended in some other countries; t this country we are not yet satisfied that there is antage to be gained by raising levels above a certain The most significant change in the 1949 edition ode[1] is that the illumination charts are now printed r. A useful addition is the list of British Standard ations on illumination and lighting fittings.

A CRANE FOR LIFTING PATIENTS

VICE which enables one nurse to lift and turn a heavy or a patient in a heavy plaster-cast, has been designed C. H. Cullen, an engineer. The apparatus consists ter frame of 'Duralumin,' consisting of two uprights ing a crossbar to which an oblong frame is slung bed belting. The belting passes over pulleys at each d leads to a winch, on one of the uprights, operated by a crank-handle. By means of this winch the frame can be raised or lowered. From the frame depend two broad canvas slings which can be passed under the patient and secured; and these slings pass over parallel rollers fitted to either side of the frame. The apparatus, which can be assembled in ten minutes, stands over the bed with one upright at the head and one at the foot. The slings are threaded round the patient and fastened over the parallel rollers of the frame. The winch can then be operated by a nurse, and when the patient is clear of the bed he can be d easily by pulling one of the canvas slings so that it round over the rollers. If a patient in a plaster-cast be lifted the distance between the parallel rollers can be ished so that the plaster is well gripped by the slings the patient is half turned, and there is no danger of rolling over suddenly. The device is said to make easy, and comfortable the moving and turning of helpless and heavy patients. It should be specially useful where nursing staff is scarce.



The crane in action.

The Cullen Crane has been patented and is made by Cecil H. Cullen & Son, Langford, Bristol.

University of Oxford

On July 30 the following degrees were conferred:

D.M.—G. P. Maher-Loughnan.
M.Ch.—G. J. Fraenkel.
B.M.—G. F. Harris, J. C. F. Poole, R. O. Payne, Patricia M. Gilham, Sabine J. Strich, Alison D. Reid, D. J. Woolford,* T. C. Barns,* Ruth E. Trilling.*

* In absentia.

University of London

At recent examinations the following were successful:

M.D. (branch I, medicine).—G. M. Bailey, D. H. Bennett, A. C. Boyle, H. W. Bunje, N. R. Butler, J. A. Chamberlin, C. E. Dent, H. E. de Wardener, I. R. Gray, K. G. Green, T. A. Grimson, K. J. Gurling, Michael Hamilton, J. N. Harris-Jones, M. F. Hart, M. S. R. Hutt, Madeline K. Keech, D. R. Laurence, G. de J. Lee, G. H. T. Lloyd, John Marks, D. B. Morgan, F. W. Nash, F. T. Page, Diana G. Paradise, R. G. Pitman, Nallarakuppillai Ponnampalam, T. A. J. Prankerd,* D. L. Rees, T. A. Richards, Matthew Steel, S. J. Steel, P. G. Swann, D. M. E. Thomas, N. A. Thorne, L. H. Turner, Eric Waddington, R. S. Walker, J. R. Wilson, W. J. S. Wilson.
M.D. (branch II, pathology).—Rosemary P. Biggs,* Feroze Novroji Ghadially, C. L. Greenbury, R. F. Jennison, Sylvia D. Lawler,† W. D. Linsell, C. F. Ross, C. H. Smith, H. E. Vickers, K. W. W. H. Walton, Francis Whitwell.
M.D. (branch III, psychological medicine).—J. H. Rey, Alexander Shapiro, Fede M. Shattock.*
M.D. (branch IV, midwifery and diseases of women).—J. D. Martin, N. F. Morris, A. C. Pearson.
M.D. (branch V, hygiene).—Doris A. Craigmile, M. T. I. Jones.
M.D. (branch VI, tropical medicine).—David Lawrence.

* University medal.
† Distinction.

Dr. Robert Knox has been appointed to the chair of bacteriology at Guy's Hospital medical school.

Dr. Knox took the Conjoint qualification from St. Bartholomew's Hospital in 1932 and his M.B. Lond. the same year. Two years later he proceeded to his M.D. and the M.R.C.P. After holding house-appointments and a chief assistantship at Barts he became demonstrator in pathology at the University of Cambridge, where he took his M.A. in 1935. Later he joined the staff of the Imperial Cancer Research Fund and he worked at the Mill Hill laboratories till he was appointed to his present post of director of the public health laboratory at Oxford under the Medical Research Council. In 1945 the University of Oxford conferred on him the degree of M.A. Dr. Knox has published papers on bacterial tetrathionase and on the effect of penicillin on cultures in liquid and solid media.

The title of professor of bacteriology has been conferred on Dr. F. R. Selbie in respect of the post held by him at Middlesex Hospital medical school.

Dr. Selb [illegible] at the University of Aberdeen with first-class [illegible] house-appointments in Aberdeen before he [illegible] Imperial Cancer Research Fund in London. In 1932 he took his M.D. with highest honours. In 1939 he became assistant pathologist at the Bland-Sutton Institute at the Middlesex Hospital, and two years ago he was appointed to a readership in bacteriology at the school.

University of Manchester

Mr. W. Sayle-Creer has been appointed honorary clinical lecturer in orthopædic surgery.

An annual prize in pathology has been established in memory of the late Dr. William Susman, lecturer in morbid anatomy and histology from 1926 to 1948. The first award will be made in 1950.

British Society of Periodontology

This society has lately been formed to promote the study of periodontology, and Dr. E. W. Fish has been elected the first president. The society will meet during the winter months, and papers, communications, or demonstrations will be presented. The initial membership is about 40. The hon. secretary may be addressed at the Institute of Dental Surgery, Eastman Dental Clinic, Gray's Inn Road, London, W.C.1.

Establishments of Medical and Dental Staff

The Minister of Health has asked the regional hospital boards and the boards of governors of teaching hospitals to tell him the number and type of posts which they have determined as the establishment of their hospital services for the immediate future. If a different establishment is contemplated within the next two years, the contemplated new figure is also to be stated. The establishments, the Ministry points out, are not subject to its approval, but it would be helpful to the Minister to know what is being done by boards and committees.

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[1] btainable from the society at 32, Victoria Street, London, S.W.1. Pp. 28. 2s. 6d., post free.

Corps, he once more settled in Philadelphia, he quickly won recognition. Soon afterwards he set up his famous arthritis clinic at the Abington Memorial Hospital. He also joined the staffs of the Chester County Hospital and the Presbyterian Hospital.

His *Arthritis and Rheumatoid Conditions*, which first appeared in 1930, marked an important advance in the approach to arthritis, for his studies of the disturbances of normal physiology in the early stages of this group of diseases did much to remove the confusion surrounding them and to put their treatment on a scientific basis. His *Medical and Orthopædic Management of Chronic Arthritis* (with R. B. Osgood) appeared four years later. A former chairman of the American Campaign for the Control of Rheumatism, Pemberton was in 1946 awarded the gold key of the American Congress of Physical Medicine in recognition of his work on arthritis. But his reputation was transatlantic and his honorary fellowship of our Royal Society of Medicine was only one sign of the European esteem he had gained.

Appointments

BLACK, M. D., M.B. Glasg., F.R.C.S.E., F.R.F.P.S., M.R.C.O.G.: asst. obstetrician and gynæcologist, Lanark County area.

ERSKINE, J. P. O., M.B. Glasg., F.R.F.P.S., M.R.C.O.G.: *chief obstetrician and gynæcologist, Dunbarton County area.*

HOLLAND, C. B., D.S.C., M.B. Manc., D.A.: consultant anæsthetist, Ipswich area.

TENNENT, R. A., M.B.E., M.B. Glasg., M.R.C.O.G.: chief obstetrician and gynæcologist, Lanark County area.

King Edward VII Convalescent Home for Officers, Osborne:

Civil Consulting Staff:

BEDFORD, D. E., M.D. Lond., F.R.C.P.
BRINTON, D. H., D.M. Oxfd, F.R.C.P.
BROOKS, W. D. W., M.A., D.M. Oxfd, F.R.C.P.
FRASER, Sir FRANCIS, M.A. Camb., M.D. Edin., F.R.C.P., F.R.C.P.E.
MARNHAM, RALPH, M.A., M.CHIR. Camb., F.R.C.S.
OSMOND-CLARKE, HENRY, C.B.E., M.B. Dubl., F.R.C.S., F.R.C.S.I.
PORRITT, A. E., C.B.E., M.A., M.CH. Oxfd, F.R.C.S.
ROSS, Sir JAMES, M.S. Lond., F.R.C.S.

Births, Marriages, and Deaths

BIRTHS

ALLEN.—On July 27, in London, the wife of Dr. S. J. Allen—a daughter.

ASHWORTH.—On July 31, the wife of Dr. H. W. Ashworth—a daughter.

CONWAY.—On July 19, in Glasgow, to Dr. Lilian Conway (*née* Donald), wife of Dr. Hugh Conway—a daughter.

BEILBY.—On July 29, at Hoddesdon, Herts, the wife of Dr. F. G. Beilby—a son.

DIGGLES.—On Aug. 2, at Walkden, the wife of Dr. H. Diggles—a son.

EBERLE.—On July 30, the wife of Dr. A. J. F. Eberle—a daughter.

FAIRBAIRN.—On Aug. 7, in London, the wife of Dr. A. S. Fairbairn—a daughter.

GEMMELL.—On Aug. 1, at Prestwick, the wife of Dr. A. R. Gemmell—a son.

GIMSON.—On Aug. 3, at Aylesbury, the wife of Dr. Peter Gimson—a daughter.

JEREMY.—On July 27, the wife of Dr. W. H. R. Jeremy—a daughter.

LODGE.—On Aug. 2, at Wisbech, the wife of Dr. F. E. Lodge—a son.

RAMSAY.—On July 30, at Londonderry, the wife of Dr. R. H. Ramsay—a daughter.

* STERN.—On June 12, in Cape Town, to Dr. Edna Stern (*née* Bowman), wife of Dr. Alfred Stern—a son.

SULLIVAN.—On Aug. 4, the wife of Dr. B. Sullivan—a daughter.

THOMPSON.—On July 25, the wife of Dr. P. H. Thompson—a son.

WELLS.—On July 31, at Wimbledon, the wife of Mr. B. W. Wells, F.R.C.S.—a daughter.

WHITEHEAD.—On Aug. 2, at Salisbury, the wife of Dr. B. L. Whitehead—a daughter.

* Amended notice.

MARRIAGES

EASON—TOWLER.—On Aug. 6, at Croydon, Thomas John Eason, F.R.C.S., to Ruth Willand Towler, M.B.

EVANS—MITCHELL.—On July 31, in London, Carlton John Evans, M.R.C.S., to Alexa Mitchell, M.R.C.S.

DEATHS

BUTLER.—On July 29, Hedley Ormonde Butler, B.A., M.B. Camb.

CHARLES.—On Aug. 2, at Bournemouth, Rhys Pendrill Charles, T.D., M.D. Berne, F.R.I.C.

HOPKINSON.—On July 31, at Cambridge, Albert Hopkinson, M.A., M.B. Camb., B.SC. Manc., aged 85.

LYLE.—On Aug. 2, in Belfast, William Lyle, M.B. R.U.I., aged 76.

MCNABB.—On July 28, Harry Horsman McNabb, M.D. Manc., aged 74.

PALMER.—On July 28, at Accra, Gold Coast, Ralph Winnall Palmer, M.R.C.S., aged 35.

WILSON.—On July 30, in Birmingham, Theodore Stacey Wilson, M.D., B.SC. Edin., F.R.C.P., aged 88.

Notes and News

BRITISH SOCIETY OF NEUROLOGICAL S

THIS society held its 40th meeting in London, on and 23, under the presidency of Prof. Lambert Rog ings were held at the National Hospital, Queen Sq at University College Hospital medical school. T large attendance which included visitors from th States, South Africa, Australia, and Europe. Dr. Sachs, of St. Louis, was made an honorary member.

The research unit from Queen Square described t neurophysiological studies. Dr. Paul Bucy, of spoke on the surgical treatment of involuntary a subject of interest and importance at present in the extravagant and seemingly unfounded claims the daily press for cortical excision operations. disease is incurable by operation, and the most that hoped for is the abolition or diminution of tremor. Dr said that both his own experience and that of American neurosurgeons had shown that involuntary ments cannot be stopped without excising the mo which naturally produces profound weakness or the affected limb. Dr. R. A. H. Krynauw of Johann an account of his experiences of removing the hemisphere in hemiplegic epileptic children.

At the society's dinner Dr. Sachs gave some reminiscences of Sir Victor Horsley, under whom studied; and Dr. Francis Grant, of Philadelphia, about the organisation and present-day trends of ne in America.

COLLECTIONS OF MICRO-ORGANISMS PROTOZOA

IN connexion with the British Commonwealth Conference, 1946, a specialist conference was held on collections of micro-organisms; and this conference mended that a directory of the important culture co of the Commonwealth should be prepared. A di the collections maintained in the United Kingdom Crown Colonies has now been compiled by the United national committee of the British Commonwealth C of Micro-Organisms organisations; and later the gen species in the various collections are to be listed directory is obtainable, without charge, from the sec the United Kingdom committee, 38, Old Queen Street, S.W.1.

A catalogue of the arthropods, helminths, moll protozoa of human and veterinary interest that tained at institutes in the United Kingdom has been by the Laboratory Animals Bureau, Royal Veterina Royal College Street, London, N.W.1. The cat be had, gratis, on application to the director of the

SWEET RATIONING

WHEN sweet rationing is reintroduced on Aug. 14 patients will still be able to obtain, without su personal points, packets of glucose tablets for use in e These tablets are prepared specially for medicinal pharmacists are asked to reserve them for custo they know to be diabetics.

By the terms of the new Ministry of Food Order, will not be able to have glucose barley-sugar ordered for on E.C.10s. A doctor may, if he wishes, give a pati "approved order" (not being an E.C.10) which may be to a chemist only, and the barley sugar may then be o on payment by the patient.

A LIGHTWEIGHT RESPIRATOR

THERE is no longer any doubt that lives may be in the acute stage of poliomyelitis by the prompt u respirator. The great variety and ingenuity of the d constructed for this purpose were indicated by Dr. Blackwell in her paper of July 16. She mentione compact "cuirass" respirator invented by Professor B of Melbourne, consisting of a rigid jacket enclosing the t The interior of the jacket is made airtight by the rubber collars round the lower edge and round the o for the arms and neck. Rhythmic compression of the is attained by alternately raising and lowering the p inside the jacket with a motor-driven or manual According to British United Press, another respirator

OPHYLACTIC SULPHANILAMIDE IN RHEUMATIC FEVER

REVIEW OF 548 CASES

YDNEY D. RUBBO MARGARET C. HOLMES
elb., Ph.D. Lond., Dip.Bact. M.Sc. Melb.
H. LAWRENCE STOKES
M.R.C.P., F.R.A.C.P.
he School of Bacteriology, University of Melbourne,
and Children's Hospital, Melbourne

UGH sulphonamide therapy for reducing the nce-rate in rheumatic fever has been well estab- by numerous American workers, no report has ublished from British or Australian sources except son's (1945). Further, in America, Wilson and lez (1944) carefully analysed statistically the published by five other groups of workers and ded that the final assessment of preventive chemo- y must be deferred, because the recurrence-rate ot significantly lower in patients receiving chemo- y than in controls. More recently Wilson (1947) ed this view, and Perry (1948) remarked that the of prophylactic sulphonamides had not been sive.

INVESTIGATION

value of sulphanilamide as a prophylactic to reduce ecurrence-rate of rheumatic fever has been under igation at the Children's Hospital, Melbourne, 1944. The material presented here fulfils the a which Wilson considered essential for an adequate tistical analysis. The patients selected for treat- were chosen without bias, the same clinical criteria ised for the diagnosis of recurrence, and the results calculated according to the method used by Frost in his studies on pulmonary tuberculosis. The groups of patients were large enough to exclude ement of chance affecting the results. In fact, the number of 1536 person-years included in both our ol and sulphanilamide groups is the largest yet ted by a single team of workers.

all daily doses of sulphanilamide have been given nuously to 211 children aged 4–14 years for 565 n-years, and over the same period 337 children have observed as controls for 971 person-years. The children received 0·5 g. of sulphanilamide night morning, except those weighing less than 42 lb., were given 0·25 g. night and morning. Since in ourne there is no pronounced seasonal incidence of natic fever, continuous prophylaxis was maintained ghout each year. Toxic manifestations due to anilamide were carefully sought by examining the ren weekly for the first six weeks and thereafter at eek intervals, when white-cell counts were performed the general progress of the children was noted. In ew cases where abnormal findings were obtained a lete blood examination was made.

ood-sulphanilamide levels were determined in some nts; but, since it was established that a daily ge of 1 g. maintained an average blood-level of ng. per 100 ml., these routine tests were discontinued.

urrence was diagnosed on the appearance of one or major manifestations—polyarthritis, carditis, and ea—necessitating complete rest in bed and admission ospital. A parent's history of suggestive symptoms he absence of supporting evidence on clinical nination was not accepted as a recurrence.

e bacteriological work consisted of the isolation of olytic streptococci by anaerobic culture from ated throat swabs (tonsillar and postpharyngeal s), serological grouping, and sulphanilamide- itivity tests on the organisms isolated. The hæmolytic streptococci were isolated by plating out throat swabs on 8% horse-blood-agar containing 1 in 500,000 gentian violet and incubating anaerobically for 18–24 hours at 37°C. It was found early in this work that anaerobic culture significantly increased the recovery-rate of hæmolytic streptococci, a finding consistent with the results of Fry (1933) and Jones et al. (1941). The successful isolation of these organisms from identical swabs by aerobic and anaerobic techniques is compared in table I.

In most cases where strains were isolated from the anaerobic plates only a few colonies were present and the profuse growth of other organisms on the aerobic plates obscured the sparse growth of the hæmolytic streptococci. Thus anaerobic incubation, besides improving the hæmolysis, retards the growth of contaminant organisms and so provides a more sensitive method of detection, particularly when only a few streptococci are present.

TABLE I—COMPARISON OF AEROBIC AND ANAEROBIC METHODS FOR PRIMARY ISOLATION OF HÆMOLYTIC STREPTOCOCCI

Successful isolation	Group A		Groups B, C, and G	
	Aerobic	Anaerobic	Aerobic	Anaerobic
No. positive . .	121 (*63%*)	192 (*100%*)	58 (*77%*)	75 (*100%*)

The organisms were grouped serologically by Fuller's (1938) method of polysaccharide extraction and antisera of Lancefield's groups A, B, C, and G. Sulphanilamide-sensitivity tests were made according to the technique of Harper and Cawston (1945) with concentrations of 2 and 10 mg. of sulphanilamide per 100 ml. of the medium.

Recurrence-rate

Before discussing the influence of chemoprophylaxis on recurrence-rate it is essential to describe briefly the methods of matching the treated and control groups of patients. The following factors were investigated:

(1) The age-distribution in person-years for the two groups is shown in fig. 1, which shows that, except for those aged 13, the age-distribution did not vary more than 5%, and in this respect the patients may be regarded as comparable.

(2) It is well known that the likelihood of recurrence decreases with the increase of time following a major episode, either a first attack or a recurrence. Hence it was of first importance to consider the time-interval between the start of prophylactic sulphanilamide therapy and the occurrence of the last major episode. Fig. 2 shows the time-interval separating major episodes, calculated from an analysis of 162 recurrences in children attending our clinic over 1253 person-years. It will be seen that the tendency to recur is greatest during the first and second years following a major episode, and that the recurrence-rate thereafter is constant, but lower, during the third and fourth years. The increased recurrence-rate during the second year, which differs from

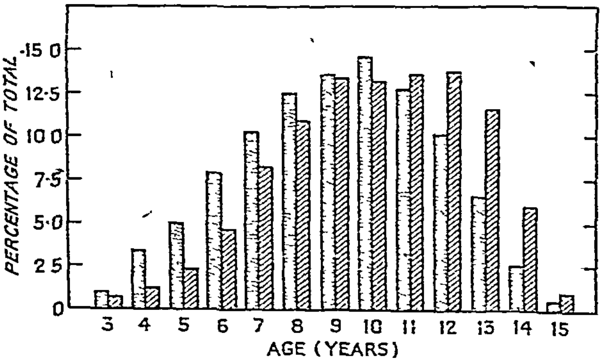


Fig. 1—Age-distribution in person-years for sulphanilamide group (hatched columns) comprising 565 person-years and for controls (stippled columns) comprising 971 person-years.

Royal Institute of Public Health and Hygiene

Dr. George Graham has been appointed Harben lecturer for 1949. He will deliver his lectures on Jan. 23, 24, and 25, 1950, and he has chosen diabetes as his subject.

Rector of Malta University's Visit

Dr. J. A. Manché, rector of the University of Malta, is spending three weeks in this country visiting laboratories, medical schools, and teaching hospitals to see teaching methods.

Regional Neurosurgeon

Mr. J. M. Small, assistant neurosurgeon in the United Birmingham Hospitals, has be [illegible] -charge of the Birmingham regional [illegible]

International Union of Nutritional Sciences

In connexion with meetings of the committee of this body, to be held in Copenhagen on Sept. 12 and 14, it has been arranged to hold some scientific sessions and visits to institutes of nutritional interest in the neighbourhood of Copenhagen between Monday and Friday, Sept. 12 and 16. It is thought that these may be of interest to a wider circle of nutritional workers. Further information may be had from Prof. H. Dam, biology department, Polytechnic Institute, Østervoldgade 10 L II, Copenhagen, Denmark, or Dr. Torben K. With, Rigshospitalet, Copenhagen, Denmark.

Sprayed Pears

Examinations made by medical officers of health have shown that a small proportion of the pears now arriving from Italy still retain a slight trace of an antiparasitic spray. The spray can easily be removed by wiping with a cloth, and the health authorities are examining all the pears now arriving to ensure that this is done where necessary before the fruit is offered to the public. The Italian commercial authorities have taken steps to prevent further consignments of affected fruit from being exported.

Exhibition for the Rheumatic

The British Rheumatic Association is holding an exhibition from Sept. 27 to 30, at the Town Hall, Chelsea, which will include a display of wheel chairs and a demonstration of the work of the disablement section of the Ministry of Labour, of "Remploy" and of voluntary organisations in training and work for the disabled, and of aids and appliances for home-therapy and physiotherapy. A conference, on the welfare of the rheumatic patient and the interests of the handicapped rheumatic, will take place concurrently with the exhibition. Tickets for the conference may be had from 5, Tite Street, London, S.W.3.

Medical Sickness, Annuity and Life Assurance Society

Speaking at the annual general meeting on July 25, Mr. R. J. McNeill Love, the chairman of the directors, said that since the National Health Service started the society had been able to help many members, both by advice on questions which arose out of the superannuation regulations and by devising new policies to meet the altered conditions. A private limited company, the Medical Sickness Finance Corporation, Ltd., had now been incorporated to offer doctors hire-purchase facilities for cars or equipment. The corporation was operating from the society's offices.

New life assurances, he continued, effected during the year amounted to over £771,000, a record in the history of the society; while life assurance claims were less by £20,000. The total funds now exceeded £4 million.

Central Council for Health Education

At the 22nd annual general meeting, held on July 28, Dr. E. K. Macdonald, the chairman, pointed out that despite the reduction in the grant from the Ministry of Health the council had maintained its equilibrium and introduced several promising developments. During the year three series of short refresher courses had been held at 12 university centres in England, Wales, and Northern Ireland. Three-quarters of all local health authorities in England, Wales, and Northern Ireland were using the new exhibition service which provided free portable stands with regular changes of material. The council was also planning a series of leaflets dealing with specific disorders, which general practitioners would be able to hand to patients at consultation. These leaflets would contain information about diet, &c., which would supplement the physician's verbal instructions, and which the patient could keep for reference. The scheme would be operated in conjunction with local authorities.

Royal Appointments

The King has appointed the following to his household: Lord Horder, extra physician; Sir Walton, extra surgeon; Sir Morton Smart, extra surgeon.

Three Years of Family Allowances

The Family Allowances Scheme was started ago on Aug. 6, 1946. Now about 2,941,000 families of more children are receiving allowances at a cost of £60 a year. Of the families receiving allowances 1,850,000 two children, 688,000 contain three, 247,000 co and 156,000 contain five or more. The family largest allowance of £3 5s. a week consists of fourteen within the age-limits.

Institute of V.D. Technicians

At the inaugural conference of this institute, Manchester on July 23, Mr. R. A. Henderson, secretary, said that though venereal-disease were performing a very exacting and highly of great social and national importance, their yet been defined. The primary function of the ins be the recruitment and training of male Si nurses for this work, and the setting of examinations For recognition the institute must gain the venereologists throughout the country and that Medical Society for the Study of Venereal Di it would not merit such approval unless it set the possible standard. When these aims and objects accomplished, V.D. technicians could go to the authority and ask for the technical status which the of their duties warranted.

Special Glasses for Colour-blind Drivers

A new type of three-colour spectacle lens, desi pally to help the colour-blind motorist distinguish traffic signals, has been devised at the U.S. Air Force of Aviation Medicine. The new lenses, of which the halves are clear and the upper halves coloured green enable the driver to tell whether the green light or light is showing. The glasses (says British United based on the fact that, seen through a red filter, as almost black, and red or yellow almost white; green filter, red looks black and green almost white moving his eyes slightly to the right and the left the will be able to tell which light is showing, while the lower half of each lens will prevent any int normal vision for other purposes.

Water and Sewerage in Rural Areas

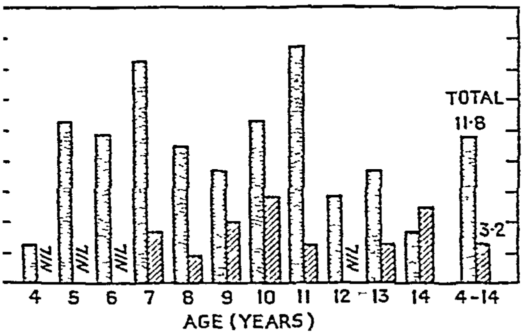
A month ago the National Federation of Women's wrote to every Member of the House of Commons House of Lords enclosing a copy of the water and survey it published in 1944. On July 25 a received by the Minister of Health, spoke of the of improving the water-supplies to meet the of agriculture; and the disquieting lack of local authorities since the 1945 Water Act, in piped water-supplies in rural areas. They urged whole question should be given a very high place Government's programme; that small-scale schemes be grant-aided and approved to a greater extent than hi that material for water-supply works should be put Prime Minister's priority list; and that the Ministry of should speed up and simplify its procedure for dealing local-authority schemes. The Minister expressed wholly in sympathy with the deputation, and do all in his power to speed up the work now going connexion with water and sewerage schemes. He emphatic that he could not grant-aid local isolated but he was equally clear that small-scale local schemes up with bigger schemes were eligible for help.

Sir Lionel Whitby, regius professor of physic in University of Cambridge, will be visiting Canada and United States from the middle of August to the be of October.

Prof. J. C. Spence's address to the conference of Health on the Need for Understanding the Individual (L 1949, i, 535) has been reprinted as a booklet. It is o from the National Association of Mental Health, 39, Anne Street, London, W.1, price 3*d*.

and 5. Hence we cannot offer any explanation in terms of age-incidence, age at the first attack, gth of time between attacks. Jackson et al. whose results are also quoted in table III, noted comment an irregular periodicity in recurrence.

ly, we wish to draw attention to the significantly ecurrence-rate in Australian children compared at in New York (Wilson and Lubschez 1944). no personal experience of the environmental and ctors operating in New York we cannot profitably this difference. The recurrence-rate in our more closely parallels that in the children ng the University Hospital, Iowa (Jackson 947).



Recurrence-rates for different ages in sulphanilamide group ed columns) comprising 211 patients aged 4-14 years (565 person- and in controls (stippled columns) comprising 337 patients -14 years (971 person-years).

HÆMOLYTIC STREPTOCOCCAL CARRIER-RATE

ppears that rheumatic fever usually follows a ytic streptococcal infection, provided certain and environmental conditions are simultaneously t. The adoption of prophylactic sulphonamide y is based on this concept, and its success must be ed as further support of this view. Though our y object here was the clinical assessment of prophylaxis, it was thought desirable to determine ect on the hæmolytic streptococcal carrier-rate in tients over a period of about three years. Our s are recorded in two ways: (1) a general sion of the influence of prophylactic sulphanil- is obtained by comparing the number of positive es obtained in each group without taking into consideration the number of children involved or the number of swabs taken from each child; and (2) the hæmolytic streptococcal status of the patients from each group is assessed, based on only those children from whom eight or more swabs have been taken during the investigation. The calculations yield essentially the same results.

III—RECURRENCE-RATES IN CONTROL AND PROPHYLACTIC SULPHANILAMIDE GROUPS

No. of person-years		No. of recurrences		Recurrence-rate %		Recurrence-rate % reported by other workers	
Control	Sulphanil-amide	Control	Sulphanil-amide	Control	Sulphanil-amide	Wilson and Lubschez (1944)	Jackson et al. (1947)
8	3	0	0	0	0	—	—
33	6	1	0	3	0	23	0
48	13	6	0	13	0	24	6
76	26	9	0	12	0	32	0
100	47	18	2	18	4	34	2
121	61	13	1	11	2	31	11
132	75	12	4	9	5	26	5
141	74	19	5	13	7	28	8
124	77	23	2	19	3	25	15
97	78	7	0	7	0	18	11
64	69	6	2	9	3	15	7
27	36	1	2	4	6	—	6
971	565	115	18	11·8	3·2	25·0	7·7

l group: 337 patients comprising 971 person-years.
nilamide group: 211 patients comprising 565 person-years.

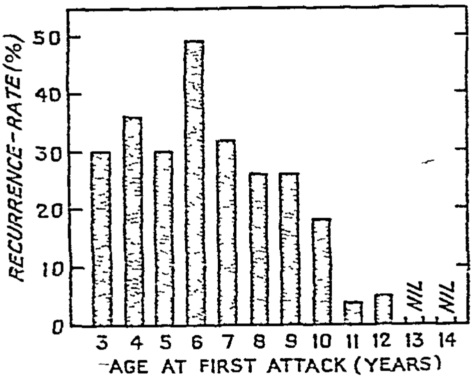


Fig. 6—Recurrence-rates in relation to age at first attack in 341 patients.

The recovery-rate of hæmolytic streptococci in the two groups (fig. 7) was as follows:

Hæmolytic streptococci	Positive Swabs (%) Controls (No. of swabs 2402)	Positive Swabs (%) Sulphanilamide group (No. of swabs 1856)
Group A	24·5	13·0
Group B	1·6	0·4
Group C	3·6	4·0
Group G	6·8	7·0

It will be noted that a considerable reduction in the rate of recovery of group-A streptococci was observed in the sulphanilamide group, compared with the controls.

It is noteworthy that where sulphanilamide significantly reduces the incidence of group-A hæmolytic streptococci it has no influence on groups C and G. In group G this discriminative effect can be attributed to the natural resistance of these strains, in that 62% isolated from the controls were resistant in vitro to 2 mg. of sulphanilamide per 100 ml. This contrasts with the sensitivity of group-A strains (fig. 9).

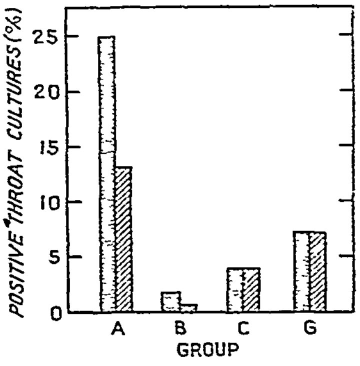


Fig. 7—Recovery-rate of hæmolytic streptococci from throats of rheumatic-fever patients: result of 1856 swabs for sulphanilamide group (hatched columns) and 2402 swabs from controls (stippled columns).

Of the children who had 8 or more throat swabs examined (table IV and fig. 8) there was a significant increase in the non-carriers of group-A streptococci in the sulphanilamide group. Further, the transient carrier state (arbitrarily defined here as that of a person from whom group-A streptococci has been detected in 1–3 swabs out of 8) was lower in the sulphanilamide group. Finally, the chronic or persistent carriers (4 or more positive swabs out of 8) differed by only 8% in favour of the treated patients—a figure which cannot be regarded as significant in that the difference might be attributed to chance with a probability of about 40%. However, the chance of recovery of streptococci is heavily weighted in favour of the treated patients, since more swabs were examined from these children.

On the evidence presented we conclude that prophylactic sulphanilamide therapy tends to counteract the colonisation of group-A hæmolytic streptococci, but this *the findings of Wilson and Lubschez (1944)*, can best be explained by the fact that our patients are kept in hospital for an average of 4·8 months after a major rheumatic episode and our time-intervals are calculated from the onset of the rheumatic attack. Thus the recurrence-rate in the first year does not cover 12 months but an average period of 7·2 months. Fig. 3 shows that 88% of our patients were put on sulphanilamide prophylaxis in the first and second years following the last major episode. On this evidence it is clear that most of the patients in the prophylactic group were studied while they were susceptible to recurrences.

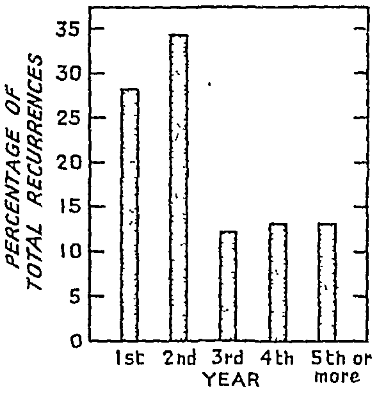


Fig. 2.—Times of recurrences of rheumatic fever (162 recurrences in 1253 person-years).

(3) It is stated (Cohn and Lingg 1943, Taran 1944) that the more severe the initial attack the greater is the tendency towards recurrence. We have tried to assess severity of the initial attack in our two groups by considering the cardiac status and the duration of complete rest in bed of our patients. The cardiac status was assessed clinically on the sleeping pulse-rate, cardiac enlargement, nature of cardiac murmurs, valvular dysfunction, and involvement of other cardiac structures. The duration of complete rest in bed merely reflected the severity of the carditis but was invaluable as a confirmatory index of cardiac involvement and as a measure of the severity of chorea in the absence of serious cardiac complications. In table II the two groups of children are compared on this basis, and it will be seen that a close agreement is obtained. We may note in passing that, though most of our patients had only mild attacks according to our classification, these were serious enough to require an average period of 4·3 months' detention in hospital. The recurrence-rates in our three classes of severity were as follows:

Severity of first attack	*No. of patients*	*No. recurring*
Mild	303	79 (26%)
Moderate or severe	41	10 (25%)

It will be seen that our findings show no significant difference in the tendency towards recurrence following a mild, a moderate, or a severe attack.

(4) In spite of consideration of the obvious factors which might explain any observed differences in the recurrence-rate in our two groups, it still might be said that less apparent factors had been inadvertently overlooked which collectively could invalidate our conclusions. For example, social environment, including the complex factors of home, school, district, and economic epidemiology, has a recognisable influence on recurrence-rate (Taran 1941). Instead of trying to measure social environment by some nebulous arithmetical or verbal yardstick, we preferred to determine the susceptibility to recurrence in our treated group by comparing the recurrence-rate of these patients before starting sulphanilamide therapy with that of the controls. Fig. 4 shows parallel and closely identical recurrence-rates in the two groups. In fact, the tendency towards recurrence was greater in the presulphanilamide patients than in the controls.

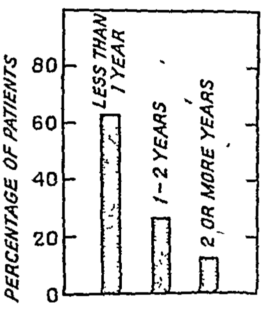


Fig. 3.—Times of start of prophylactic sulphanilamide therapy after an episode of rheumatic fever.

RESULTS

Having presented sufficient evidence to establish the close identity of our two groups, we now present our findings on the value of prophylactic sulph therapy. The results are recorded in table III fig. 5. It will be seen that the recurrence significantly less in the sulphanilamide group the controls. Combined results showed that for aged 4–14 years a recurrence-rate of 11·8% was o in the controls, whereas one of only 3·2% was o in the sulphanilamide group. When it is recalled these results are calculated from an analysis of recurrences in 971 person-years among the control 18 in 565 person-years among the sulphanilamide the statistical significance of our findings is ap Further, our results closely parallel the con reports of previous workers, which show r rates of 2·2% for the treated groups and 13·7% controls (Hench et al. 1948).

The recurrence-rates in children aged 14 years 6% in the sulphanilamide group and 4% in the co (table III). This difference is not significant and, had the dosage of sulphanilamide been incr accordance with the child's gain in weight, a favourable result might have been obtained.

TABLE II—COMPARISON OF SEVERITY OF FIRST A CONTROL AND SULPHANILAMIDE GROUPS

Severity of first attack	Average stay in hospital (months)	Control group (300 patients)	Sulp (176
Mild	4·3	87%	88%
Moderate ..	6·6	10%	11%
Severe ..	10·8	3%	3%

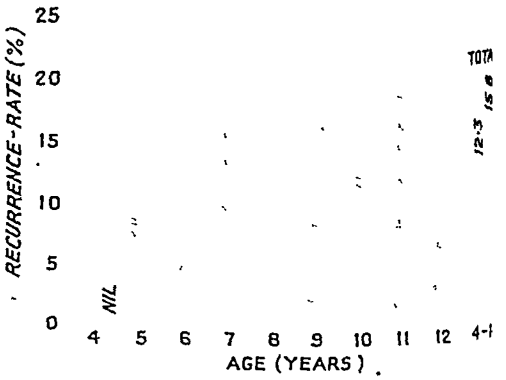


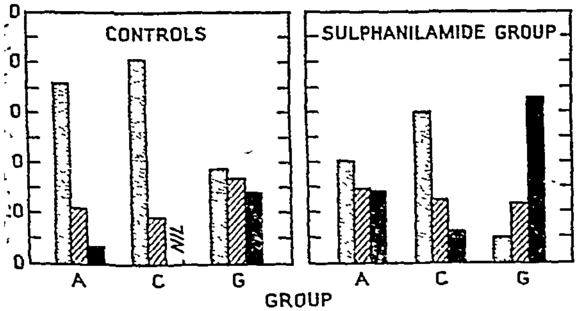
Fig. 4—Recurrence-rates for different ages in pre-sulphanilamid (hatched columns) comprising 183 patients aged 4-12 ye person-years) and in controls (stippled columns) compris patients aged 4-12 years (880 person-years).

Another point worthy of comment is the irregularity in the recurrence-rates in each age This finding is quite different from that of Wilso Lubschez (1944), whose results are also includ table III. It will be noted that these workers, pr ably using the same method of calculation as w obtained a gradual and regular decrease in recu rate as age progressed from *7 to 13 years*, where figures show distinct peaks at 7, 10, and 11 years have carefully examined our data from different of view in an attempt to discover the reason for peaks and for the discrepancy from the general of results reported by Wilson and Lubschez. We found that the tendency towards recurrence is gr in patients having a first attack at the age of 6 yea diminishes as the age at the first attack advances. finding is illustrated in fig. 6.

Further, calculation of recurrence-rates for the di ages, based only on first recurrences and not on mu recurrences, showed the same peaks as indicat wabs were cultivated anaerobically, and from 1331 lytic streptococci were recovered. These organisms grouped serologically. This survey showed a d incidence in group-A streptococcal carrier-rate the treated patients, but the results were less itic than those obtained in the United States training centres during 1944 (United States Navy tment 1944). Further, carrier-rates for groups C and unaffected by prophylactic sulphanilamide therapy. two phenomena—recurrence-rate and group-A r-rate—thus exhibited a common decline under the nce of prophylactic sulphanilamide. This evidence ms the current concept that group-A hæmolytic ococci are ætiologically related to rheumatic fever, t must be emphasised that the presence of these isms in the throat is not per se a criterion of infec-

It is now generally agreed that a high (greater 150 units per ml. of serum) or rising antistreptolysin titre is a more valuable indication of streptococcal ion than is isolation of the organism from a throat . (Commission on Acute Respiratory Diseases , Keith and Carpenter 1946). It was impossible e present study to carry out mass antistreptolysin ions, and we have restricted the use of this test ute rheumatic attacks. Accordingly, the reduced ence of hæmolytic streptococcal carrier-rate can be regarded as suggestive evidence of a corresponding ction in streptococcal infections.

spite of these favourable impressions two possible tions to prophylactic sulphonamide therapy can dvanced. The first deals with the toxic reactions to the drug, and the second with the development of stant organisms.



9—Resistance of hæmolytic streptococci to sulphanilamide in phanilamide group and controls: stippled columns, sensitive growth at 2 mg. per 100 ml.); hatched columns, partially istant (growth at 2 mg. per 100 ml.); black columns, resistant owth at 10 mg. per 100 ml.). Number of strains tested: group A ; group C, 107; group G, 161.

one of our patients experienced major toxic reactions ranulocytosis, severe anæmia, or exfoliative dermatitis) very few developed minor effects, such as morbilliform es and erythemas, during the entire period of study. ic reactions, therefore, have been conspicuously mportant. Though this finding is consistent with experiences of most American workers except well and Button (1941) and Kuttner and Reyersbach 43), we do not recommend chemoprophylaxis unless ients can be observed at regular intervals and appro- ite laboratory examinations can be made. In this ic routine clinical and laboratory examinations were de on the patients up to the age of 14, when they were nsferred to a hospital for adults.

he development of sulphanilamide-resistant strains of molytic streptococci has been demonstrated, and as been shown that this change is permanent in most the cultures. There was no evidence to suggest that s mutation was associated with any loss or gain in ulence of the organism. The question now arises ether the clinical benefit of prophylaxis is counter- anced by the potential danger associated with the development of sulphonamide-resistant organisms. In answering this question we must consider the issue from two points of view, that of the individual and that of the community in which he lives. From the individual point of view we have shown that chemoprophylaxis is of benefit in that it offers a significant degree of protection against recurrent streptococcal implantation. From the community angle benefit must also be derived since prophylaxis effectively reduces the carrier-rate which in turn must reduce infection pressure irrespective of whether we are dealing with a semi-closed community, such as a convalescent home, or an open urban community. The development of resistant strains, if there is no change in virulence or infectivity, cannot increase the infection-rate, since the incidence of infection is independent of this factor. Accordingly, resistant strains developing in a relatively small and selected group of the total population, such as rheumatic children, is not an epidemiological but a therapeutic problem, and, as already pointed out, penicillin provides a more than adequate substitute in case of manifest infection. Once the decision is made, treatment should be pursued continuously over the recurrence-susceptible years with adequate clinical, hæmatological, and, possibly, bacteriological supervision. The development of resistant forms, particularly in chronic carriers, is no indication for the cessation of prophylaxis, since the treatment still affords protection against reinfection with sensitive strains.

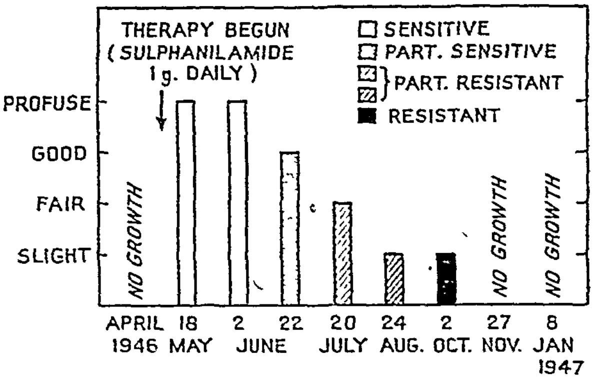


Fig. 10—Development of resistance to sulphanilamide during prophylaxis.

It may be asked which cases of rheumatic fever should be selected for treatment, when should therapy be instituted, when should this treatment cease, and what sulphonamide should be used? We consider that all patients who have had undoubted rheumatic fever or chorea should, if circumstances permit, be given the benefit of this treatment. It would be wrong to assume that it is indicated only for the moderate or severe cases, and that the mild cases in which the patients are discharged after three months' stay in hospital with no apparent cardiac damage can be ignored. A typical case from our series was in a child who had a mild attack of rheumatic fever at the age of 7 years and developed a polyarthritis with an associated carditis. This child was kept in hospital three months and discharged perfectly well. A year later he had a recurrence almost identical in nature and severity with his first attack. At the age of 12 years (five years later) he had a second recurrence and on this occasion showed pronounced mitral and aortic valvular changes, which have persisted. It was only after this second recurrence in 1944 that sulphanilamide therapy was begun; and, while he was under treatment he had no further recurrences. This initially mild case is typical of many in which repeated recurrences eventually lead to a state of gross valvular damage. Accordingly, chemoprophylaxis must be considered for all cases of rheumatic fever irrespective of the severity of the first attack.

antagonism is not completely successful, especially in children with enlarged tonsils, who tend to become chronic streptococcal carriers.

SULPHANILAMIDE RESISTANCE

The reluctance of clinicians to introduce continuous sulphonamide prophylaxis is partly due to the fear of developing sulphonamide-resistant organisms in the individual and in the community. This is understandable in view of the unfortunate experiences in the United States Naval Forces (Damrosch 1946, Delamater et al. 1946, Epidemiology Unit No. 22 1945, Roberg 1946, Wilson 1946) and the well-authenticated reports that drug-fastness tends to develop after prolonged and inadequate dosage (Colebrook et al. 1944, Hendry 1942). However, the arguments that called for caution in military establishments in 1945 are somewhat academic when applied to a restricted portion of civilian communities in 1949. In treating rheumatic children we are dealing with a very small fraction of the total or child population; hence the danger of dissemination of drug-resistant organisms is correspondingly small, and in the event of serious illness due to sulphonamide-fast organisms other chemotherapeutic agents, such as penicillin, are readily available. Though Baldwin (1947) did not encounter sulphadiazine-resistant streptococci in children given sulphadiazine prophylactically, our experience has been somewhat different. It will be seen from the results of tests on 669 strains of hæmolytic streptococci by Harper and Cawston's (1945) method that there was an increase in the number of resistant forms isolated from the treated group (fig. 9). For example, in a comparison of organisms from control and sulphanilamide groups the increase in resistant strains was from 6 to 29% in group A, from nil to 13% in group C, and from 28 to 66% in group G.

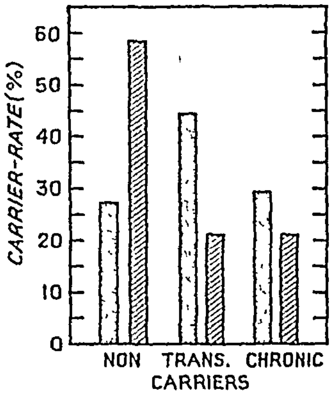


Fig. 8—Group-A hæmolytic streptococcal carrier-rate in sulphanilamide group (hatched columns) and in controls (stippled columns).

These findings call for comment in an attempt to reconcile them with the clinical benefits already described. The first point to be emphasised is that, *quantitatively*, prophylaxis lowers the streptococcal carrier-rate and hence lessens the risk of manifest infection and its sequelæ. Secondly, the development of sulphonamide-resistance is a gradual process during which the degree of infection appreciably wanes owing to natural defence mechanisms. This was well shown in a patient who contracted a group-A type Woodbury infection shortly after the start of sulphanilamide prophylaxis. The fate of this organism and its changing resistance are shown in fig. 10.

Another aspect of the problem of drug-resistance which received our attention was the permanency of this change. Twelve resistant strains were subcultured daily in sulphonamide-free serum-broth for five weeks. The sensitivities of the original and passaged cultures under identical conditions are shown in table V. It will be noted that most of them retained their original resistance after as many as 25 subcultures in the absence of sulphanilamide, and for this reason the change must be regarded as permanent. These findings provide little support for discontinuing prophylaxis in the hope that there will be a reversion of sensitivity during temporary cessation of treatment. This contention is

TABLE IV—INFLUENCE OF PROPHYLACTIC SUL *ON CARRIER-RATE OF GROUP-A HÆMOLYTIC*

Patients' group	No. of children	No. of swabs	Average no. child	Average interval	Non-	Tr
Control ..	63	608	10	2·5	27%	44
Sulphanilamide	122	1435	12	2·3	58%	21

Non-carrier, no positive swabs.
Transient carrier, 1–3 positive swabs
Chronic carrier, 4 or more positive swabs.

further supported by our observation of thre who continued to harbour sulphanilamid organisms for several weeks after withdrawal of amide. Hence the indication for maintainin in the presence of resistant organisms is the offered against exogenous reinfection by sulp sensitive strains.

DISCUSSION

The object of the present study has been the value of prophylactic sulphanilamide th *method of reducing recurrence-rate in rheum* We intentionally refrained from expressing an this question until sufficient data had been *to satisfy the most rigorous requirements of* analysis. Thus the present work covers about a half years' observation of 548 patients, a tot person-years. During this time 134 recurrences which were in a form severe enough to warrant to hospital and which fulfilled the diagnostic Jones (1944). The patients were divided into tw one receiving prophylactic sulphanilamide and serving as a control. The two groups were closely particular attention being paid to (1) age-dist (2) time of start of prophylaxis in relati major episode; (3) severity of initial attack; susceptibility towards recurrence due to factors.

The results of this study showed the recurrence-rate for children aged 4–14 years to and that prophylaxis reduced this figure to 3·2 *figures are statistically significant.*

On the basis of these results and those of ot there is little doubt that continuous prophylactic amide administered in doses of 1 g. daily to patients who have had one or more attacks of fever will significantly reduce the risk of recurrence.

Simultaneously throat swabs were taken from *visiting the clinic during the same period.*

TABLE V—STABILITY OF SULPHANILAMIDE-RESIST GROUP-A HÆMOLYTIC STREPTOCOCCI AFTER D CULTURE FOR FIVE WEEKS

Strain	Growth at 10 mg. per 100 ml.		Comment
	Original culture	Passaged culture	
1	+	—	± at 2 mg. per
2	+ +	—	+ + at 2 mg. pe
3	±	±	No chang
4	+	+	,, ,,
5	+	+	,, ,,
6	+ +	+	,, ,,
7	+ +	+ +	,, ,,
8	+ +	+ +	,, ,,
9	+ +	+ +	,, ,,
10	+ +	+ +	,, ,,
11	+ +	+ +	,, ,,
12	+ +	+ +	,, ,,

—, no growth.
±, slight growth.
+, fair growth.
+ +, good growth.

al tumours of the kidney form a single group. ted subdivision of this group of common renal s arises either from antiquated views on histogenesis ignorance of the wide range of structure to be seen group and even in one tumour. 'Grawitz tumour,' nephroma,' 'clear-celled carcinoma,' 'solid-celled ma,' &c., are not separate kinds of tumours but names which have been given to the single entity, ma of the renal parenchyma."

his view of renal tumours is accepted by most ists is, I think, true, but the reorientation of to accord with this view of the unity of kidney is (other than the embryonic nephroblastomas) nterpret the findings of carcinoma cases with hological findings as are cited below is slow to e.

llowing statements on ætiology and pathology n from Willis's book.

nce.—In Willis's own series of 1060 necropsy ich were all studied microscopically the incidence oma of the kidney was $2^1/_2$% (27 cases). This it a tenth of the incidence of gastric, and a third of pulmonary, neoplasms.

About half the cases occurred in the fifth and cades, the highest proportion being in the sixth It was rare under the age of 30. Willis's t patients were aged 29, 30. and 32. The mean eath was 58.

There was a preponderance of males over ; the ratios in published reports range between l 5 : 1 males to females.

of Tumour.—Young tumours are invariably in the cortex of the kidney.

l Factors.—There is a clear relationship between na and adenoma of the kidney, and there is for the almost invariable origin of adenomata rplastic foci in damaged kidneys. However, y only some carcinomata arise from pre-existing ata. for in only a few cases do carcinomatous show evidence of nephritis or of arteriosclerosis usually accompanies adenomata.

Structure and Growth.—The seeming circumscrip- l expansive lobular appearance of the tumours; ariable bulk, from small adenoma-like tumours masses weighing many pounds; their yellow ge colour, rendered all the more variegated by of fibrosis, necrosis, hæmorrhage, and cystic ; and their grossly polypoid invasion of the elvis and main veins are all familiar features.

scopic Structure.—The cellular make-up is very : (1) "clear-celled" type of growth is very ive; (2) solid-celled papillary adenocarcinoma is n: (3) anaplastic variants, spindle-celled or rphic-celled, and often diffuse and sarcoma-like earance, have led to many erroneous diagnoses "sarcoma" or "mixed" tumour (case 4); and ly vascular and hæmorrhagic tumours also used a source of confusion in histological diagnosis ithelioma," "endothelioma," "angiosarcoma").

stases.—These are very fickle and unpredictable r behaviour. Some grow for long periods and to izes without yielding metastases (case 2), whereas remain small and symptomless yet produce large metastases usually by the blood-stream (case 3). atic growths have caused many errors of diagnosis. nephrectomy metastatic growths may soon appear lungs, bones, or elsewhere, or they may not appear ix, eight, or ten years later. Perhaps more often ny other tumour renal carcinoma produces solitary rs in bone, brain, or other tissues; and it has claimed (Smyth 1939) that surgical removal of primary and secondary growths is sometimes ve in such cases, a claim which, it need scarcely be said, should not be made until there has been long postoperative freedom from recurrences.

In about 50% of Willis's necropsy cases the lumbar glands were involved, and in about the same proportion involvement occurred in glands regional to organs containing metastases. Blood-borne metastases were found in the lungs in three-quarters, in the liver in half, and in the skeleton in nearly half of fatal cases. Such metastases in the skeleton often simulate primary disease of bone. Metastases in the brain (see cases 3 and 4) occur in a quarter of fatal cases; hence carcinoma of the kidney is the third commonest tumour to give rise to metastases in the brain (after neoplasms of the lung and breast).

CLINICAL PICTURE

The classical clinical triad of hæmaturia, pain. and tumour is now recognised to be found only late in the disease if at all. Hæmaturia, generally painless, is usually given as the most frequent first symptom and one which requires full urological investigation in patients of carcinoma age.

Of the cases presenting with secondaries, the lungs, the liver, the skeleton, and the brain are the common sites in order of frequency. Secondaries in the lungs often show a suggestive cannon-ball radiological appearance but may mimic primary lung carcinoma (case 3). A review from the files of 6577 necropsies by Hale and Burkland (1943) revealed 54 carcinomata of the kidney presenting silently with the result that no evidence for the true diagnosis was found during life.

PROGNOSIS

Judd and Hand (1929), in a review of 367 cases of carcinoma of the kidney seen at the Mayo Clinic between 1901 and 1928, found that 106 (51·5%) of the patients who had undergone nephrectomy were alive 3–20 years after the operation, 36% had survived 5 years or more, and 13% had survived 10 years or more. They state that "some were known to have metastases at the time of operation, and from the evidence at hand it would seem that the condition was arrested for a time. Therefore even in these cases nephrectomy would seem to offer a reasonable degree of palliation." Abeshouse and Weinberg (1945), in a series of 34 cases of carcinoma of the kidney, found the five-year cure-rate to be 35% and the ten-year cure-rate 20%.

CASE-RECORDS

Case 1.—A man, aged 42, was seen on Oct. 24, 1944, complaining of recent faintness and giddiness, attributed by him to migraine though without headaches. Melæna had been observed, without diarrhœa. His friends had noted his pallor.

Family History.—The patient's mother and his maternal grandmother had been obese and subject to migraine. His mother had died of carcinoma of the transverse colon. His father had died of uræmia after urinary calculus.

Previous History.—The patient had been subject to migraine from the age of ten years. The migraine had originally been severe, with vomiting, but now usually consisted of left frontoparietal headache lasting for one or two days, with nausea, and relieved by injections of ergotamine tartrate. The patient had had psoriasis. In May, 1943, when he had been examined for migraine, he had had abdominal obesity, a blood-pressure of 180/110, and a trace of albuminuria, with slightly impaired water-elimination test.

On examination the patient was pale and had a systolic blood-pressure of 130 mm. Hg. No other physical signs beyond abdominal obesity were found.

Blood-count.—Red cells 3,160,000 per c.mm., Hb 5·35 g. per 100 ml., colour-index 0·57, white cells 10,000 per c.mm. (polymorphs 70%).

Stools were positive for occult blood.

Barium Meal.—Findings suggested chronic gastritis with no evidence of ulcer or neoplasm. An oval opacity with clear centre near the duodenal loop suggested a gall-stone.

Prophylaxis should be instituted when a quiescent state has been reached after a major episode, preferably the first attack. This would probably be about three or four months after the onset of the episode, when the patient is about to be discharged from the convalescent hospital. The start of prophylactic therapy at this stage will have none of the untoward reactions which may arise if treatment starts in the acute phase (Massell and Jones 1938, Swift et al. 1938).

As to when sulphonamide prophylaxis should be stopped we have little factual information. Baldwin (1947) found no evidence of increased susceptibility towards recurrence on withdrawal of sulphadiazine.

Our experience, with few exceptions, has been restricted to the observation of children up to the age of 14, when they are discharged from the clinic and prophylaxis becomes the responsibility of the hospital for adults. It is evident that the tendency towards recurrence decreases as age advances, but in unusual circumstances, such as entry into an environment of high infection pressure—e.g., a military establishment—rheumatic fever can and does recur in adults. Hence the decision to discontinue prophylaxis after treatment during the recurrence-susceptible period must be determined for each patient according to his cardiac status and his environment.

As to the choice of sulphonamide, we have had little experience. The work reported here was begun in 1944, when the newer sulphonamides were unobtainable, and we have persisted with the same drug, sulphanilamide, to accumulate sufficient data on its effectiveness. More recently we have been using sulphadiazine in average daily doses of 0·5 g., but it is too soon to make any comparisons. In view of the close parallelism between our findings and those of American reports for sulphadiazine prophylaxis there appears to be little to choose between the two drugs.

SUMMARY

The influence of prophylactic sulphanilamide therapy in children with rheumatic fever is assessed on a clinical and bacteriological basis.

The recurrence-rate in 211 children aged 4–14 years who were maintained on small daily doses of sulphanilamide for 565 person-years was 3·2%. In a control group of 337 children, closely matched with the treated group and studied simultaneously for 971 person-years, the recurrence-rate was 11·8%.

The hæmolytic streptococcal carrier-rate in the two groups of patients was determined by repeated throat cultures, and a significant reduction of group A was observed in the treated group.

Sulphanilamide-resistance tests on 669 strains isolated from both groups of patients revealed that 29% group-A strains isolated from the treated group and 6% from the controls were resistant to 10 mg. of sulphanilamide per 100 ml.

The following conclusions have been reached:

Sulphanilamide prophylaxis is of definite value in reducing the recurrence-rate in rheumatic fever.

Treatment should be available to all patients provided adequate clinical and laboratory control is exercised.

Treatment should begin in the quiescent period following a major episode and should be continued at least during the recurrence-susceptible years—i.e., up to the age of 14 years.

Toxic reactions to sulphanilamide are minimal and seldom a contra-indication to prophylaxis.

The development of sulphanilamide-resistant organisms in these patients is not an indication to discontinue therapy.

We wish to thank the staff of the records office, Miss M. Tricks, and the medical registrars attached to the clinic for their assistance; and Miss L. Nutting for drawing the charts.

References at foot of next column

CARCINOMA OF THE KIDNEY

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IT has long been appreciated that carcinoma (kidney can be responsible for very varied clinical dromes, but as a rule there are pointers in either sy or clinical signs to suggest a renal origin for the p. tumour.

I report here 4 difficult cases, with widely di symptoms, seen in the last four years, which w shown at necropsy to be due to renal carcinoma none of the 4 cases was the correct diagnosi clinically, despite biopsy specimens in 3 cases. In case only were there symptoms or signs referable t urinary tract.

The cases are reported because it is felt that c medicine lags behind pathology in this disease ar re-emphasise the frequency of clinical and pathol misdiagnoses. This may be of more than acad interest, since a renal tumour can produce l syndromes at a time when it may well be remo by surgery (case 2) and the five-year survival following nephrectomy is probably about 35% (and Hand 1929, Abeshouse and Weinberg 1945).

In each of these cases the diagnosis of carcino the kidney came as a great surprise to all the clini concerned, and, though extensive investigations made in each case, in only one was pyelography formed. Therefore it seems worth while to per pyelography in all cases of suspected neoplastic di when no primary growth can be found.

ÆTIOLOGY AND PATHOLOGY

In computing data on renal carcinoma Willis (has emphasised the importance of using only t necropsy cases in which the diagnosis has been con by microscopy. He opens his remarks on carcino the kidney with the following sentences:

> "Excluding the tumours of the renal pelvis an embryonic nephroblastomas, all of the remaining mal

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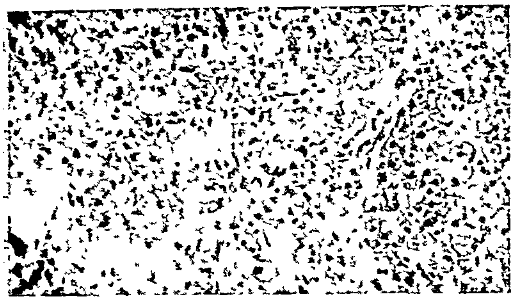

peration specimen (case 2) of renal tumour, showing charac- appearance of carcinoma of kidney. Note extreme similarity figs. 2 and 3, suggesting that "liver biopsy" was actually of large carcinoma of right kidney, since there were no ries in liver at this date.

of a gastric ulcer, and evacuation of the patient q was arranged. In April he arrived at No. 1 British Hospital, Karachi, where he was treated with diet lis with little benefit. He was placed in category hree months. His symptoms continued without a, though he gained about 1 stone in weight, making t 13 stone. In September he was further investigated me hospital. Barium-meal examinations on two occa- wed no gastric lesion. Tests for occult blood in ls were negative. "Neurotic dyspepsia" was diag- nd the patient was invalided to South Africa. In , 1943, he reached Oribi, Natal. Pain was still us, though he felt better. A barium meal showed abnormal. The patient was placed in category C ic dyspepsia. In April he arrived in Mombasa and ted to H.Q. East Africa Command. He continued spite of persistent pain. In May he was admitted 2 General Hospital, Nairobi, where enlargement of r was noted and *entamœba histolytica* was found in ls. He was not jaundiced. He was treated with ctions of emetine gr. 1. Aspirations of the liver tempted without success. The patient complained thlessness on exertion at this time. He was given tional six injections of emetine gr. 1. In August he nsferred to the 83rd General Hospital, where his as found to be palpable four finger-breadths below t costal margin. Radiography of the chest showed phragm to move evenly on the two sides. Liver- n tests were normal. An unsuccessful attempt was t liver-puncture biopsy. The patient was placed in y E by a medical board as a case of cirrhosis of the d embarked for the United Kingdom.

patient reached England in November, 1943, and was January, 1944, to the British Postgraduate School don for further investigation of unexplained hepato- . He was then a slightly apprehensive thin man g 10 stone 10 lb. in his clothes, with no abnormal l signs in any system beyond his liver, which could ated four finger-breadths below the right costal margin. rine was normal. A blood-count showed 5,300,000 lls per c.mm., Hb 95% (Sahli), white cells 9000 per with normal differential count. His erythrocyte- ntation rate was 1 mm. after 1 hour (Westergren). Kahn, plasma-bilirubin, blood-phosphatase, fasting sugar (90 mg. per 100 ml.) estimations were all normal. graphy of chest and abdomen showed lung fields normal, domes of the diaphragm moving freely, and no cencies of the liver shadow. Radiography of skull, and long bones showed nothing abnormal except a rarified area of the right parietal bone—? irregular ar groove. Eight stool examinations were negative for and ova, except two which showed cysts of *endolimax* fat analysis was normal; and three stools were ve for occult blood. Bromsulphthalein and intravenous ose liver-tests were normal. A liver-biopsy specimen efinitely abnormal, but, unlike any of the commoner lesions, chronic inflammatory lesion (Prof. H. Dible). atient was referred by Lieut.-Colonel W. R. M. Drew ank) to Westminster Hospital.

admission to Westminster Hospital in October, 1944, symptoms already described above the patient was r thin, alert, and slightly nervous. The only abnormal cal sign found was enlargement of the liver to four finger-breadths below the right costal margin. The right kidney could just be palpated. Laparotomy was agreed on as being the most likely way of elucidating the nature of the hepatomegaly.

Laparotomy (Mr. G. T. Mullally, Nov. 1).—A carcinoma of the right kidney was found as big as a football and well encapsulated, with no involvement of the renal veins. No evidence of metastases was seen. The liver was normal in size, shape, and consistence but had been displaced downwards by the renal mass. The tumour was removed with much loss of blood and with shock, which was treated with serum and blood-transfusions.

Progress.—Postoperatively the patient developed a thrombosis of the right internal saphenous vein from the ankle to the knee. On discharge from hospital on Nov. 27 he had a serum-alkaline-phosphatase level of 6 units; and radiography of the chest, long bones, spine, and skull was normal except for the (?) enlarged vascular channel of the right parietal bone. Comparison of a section from the operation specimen of the tumour with the "liver-biopsy" specimen showed identical histology (figs. 2 and 3), suggesting "liver-biopsy" was in fact tumour biopsy, the tumour having displaced the liver and occupied its site.

In June, 1945, the patient had developed skin recurrences near the operation wound and of both iliac fossæ, and radiography showed a shadow in the right superior mediastinum. The patient was given deep X-ray therapy. On July 23 he died in hospital with signs of right pleural effusion and gross hæmorrhagic ascites.

Necropsy.—Secondary deposits were seen in the liver, peritoneum, right kidney bed, iliac fossæ, right pleural cavity, and mediastinal glands. The left kidney was normal macroscopically. There was no evidence of growth in the renal veins or vena cava. The stomach appeared healthy.

Case 3.—A married woman, aged 65, had had a sudden onset of mistiness of vision of the right eye, with no diplopia and no pain, in October, 1946. She had been seen by an ophthalmic surgeon, who had found no abnormality. A week later her right upper eyelid had drooped, and soon afterwards the patient had been unable to open her eye. This had been accompanied by pain behind the right eye and on the right side of forehead and head to the vertex, and to a lesser extent behind the right ear. This pain had been associated with numbness. It had come and gone without apparent cause, but it had particularly been brought on by sneezing or by any sudden event, such as the banging of a door.

Family History.—The patient's father had died of old age at the age of 81, and her mother of cancer at the age of 89. There was no familial disease.

Past History.—The patient had had attacks of diarrhœa lasting from ten days to three weeks every month or so for twenty years, and she had passed fæces and mucus in the attacks. Sometimes she had not been able to control defæcation. Varicose veins with ulceration of legs had been present for thirty years.

On Examination (Nov. 22, 1946).—The patient was an alert woman of healthy appearance who was an active housewife. Abnormal physical signs were confined to cranial nerves: (1) smell was said to have been defective from birth; (2) the patient wore glasses at all times, though crude clinical tests did not show any apparent defect of vision; (3) there was complete paralysis of all the extrinsic muscles of the right eye, with complete ptosis and an immobile but not dilated pupil on the right side; and (4) there was partial loss of sensation over right ophthalmic fifth nerve. The size and sounds of the heart were normal. Blood-pressure was 180/85.

Investigations.—Serum Wassermann and Kahn reactions were negative. Radiography of the skull did not reveal any abnormality. On lumbar puncture the cerebrospinal fluid was clear, with normal cytology and chemistry and under a pressure of 85 mm. H_2O, and gave a negative Wassermann reaction. Blood-counts showed normal numbers of red and white cells.

The patient was discharged from hospital with the provisional diagnosis of atheromatous aneurysm of the right internal carotid artery.

Readmission.—Six weeks later the patient was readmitted. Ten days before, in outpatients, the left eyelid was seen to be closing. This had progressed since and was accompanied by pain over the left eye. Five days before readmission the patient had had a sudden hæmoptysis of about $^3/_4$ pint.

The remainder of the gastro-intestinal tract was normal. A further barium meal by Dr. Cochrane Shanks revealed that the "opaque gall-stone" was really a projection into the duodenum encrusted with some opaque material. A polyp of the duodenum was tentatively diagnosed.

Laparotomy (Dec. 16, 1944).—Mr. N. C. Lake reported: "The patient was very fat and the whole operation was rather difficult on this account. I felt a mass the size of a large chestnut projecting into the lumen of the descending duodenum. The mass was on the back wall and apparently very adherent to an enlarged right kidney. At one moment I thought it arose from the kidney but decided that the mass arose in the duodenum and had become adherent to the kidney pelvis. In the mass of fat I could not feel the left kidney (this was subsequently proved by pyelography in April, 1945, to be present). I opened the duodenum and examined the highly vascular mass which obviously invaded its posterior wall. I removed the more superficial portion of the tumour, but the deep portion was so fixed posteriorly (for reasons which ultimately became clear at necropsy) that I decided against an attempt at radical removal. I closed the duodenum, did a gastro-enterostomy, and removed some stones from the gall-bladder (these were non-opaque and had not shown on radiology of the abdomen."

The biopsy specimens were seen independently by three pathologists, Dr. F. Kellett, Dr. H. W. C. Vines, and Dr. M. Haines, who all concluded that a hæmangio-endothelioma was present (fig. 1).

Radiotherapy.—The patient was admitted to Westminster Hospital in January, 1945, for radiotherapy to duodenal tumour (Dr. F. Allchin). A total tumour dose of about 1870 r (Westinghouse) was given between Jan. 24 and April 18. During this time the patient had recurrent slight bleeding from the gastro-intestinal tract and a large hæmatemesis (2 pints) for which 2 pints of blood was transfused.

Further Investigation.—In March, 1945, a mass was palpable deep in the right hypochondrium close to the midline, fixed, firm, and non-tender. Further investigation of the renal tract was undertaken with particular reference to the functioning of the left kidney. In April an intravenous pyelogram showed a very large hydronephrosis of the right kidney with no localised deformity of the renal pelvis. The left side showed normal filling, with a slightly full renal pelvis. The dye excretion-rate was very slow. A urea-clearance test in May, 1945, showed 74% of average normal renal function. Blood-urea was 26 mg. per 100 ml. A trace of albumin was present in the urine, but no red blood-cells or abnormal cells were seen.

Progress.—The patient was weak and anæmic but was now afebrile, with blood-pressure 110/65, and was discharged home convalescent on May 7, 1945. He remained well though weak till readmitted on Oct. 16 with severe recurrent hæmatemeses, necessitating 8 pints of blood by transfusion during the first week. During this week he was severely ill with sustained fever and had two rigors (no evidence of incompatible blood-transfusion was present). Suddenly his

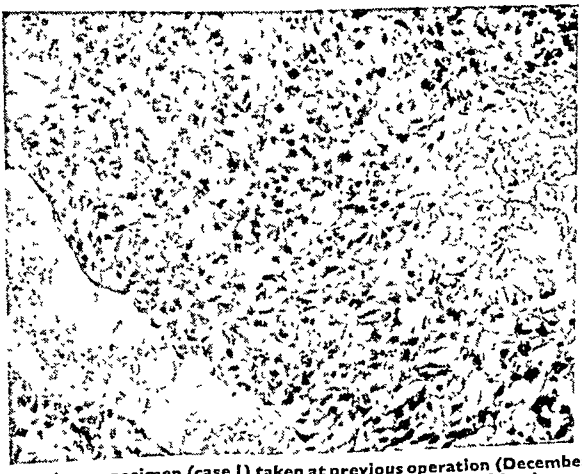

Fig. 1—Biopsy specimen (case 1) taken at previous operation (December 1944), when it was diagnosed as hæmangio-endothelioma of duodenum. (× 150.)

clinical condition improved, and this was acc
a fall to normal of his temperature, pulse-rate, and
On Oct. 29, a blood-count showed red cells 3,
c.mm., Hb 56%.

On Nov. 5, the patient developed a tempera
physical signs and no evidence of further blee
culture grew a coliform organism (? contami
repeat blood-culture yielded no growth). The
then became intermittent, with rigors, and the
very ill and anæmic (Hb 31%). A course of '
thine' was started.

On Nov. 16, there were further frank
4 pints of whole blood was transfused before
—operation had been decided on, despite the poor
because all other treatment had failed. There wa
chance that radical removal of the tumour or
surgery could be done, particularly since it was
that the left kidney was present and functioning
there was no good evidence of secondaries.

Laparotomy (Mr. G. T. Mullally, Nov. 17).—T
was found in the second part of the duodenum
neighbouring structures. The right kidney w
enlarged. It was decided to attempt a radica
The hepatic flexure of the colon was mobilised,
the growth the middle and right colic arteries
divided. The tumour mass, with the right ki
removed by dividing the common bile-duct, the
third parts of the duodenum, and the body of the
The inferior vena cava was found closely appl
tumour's posterior surface and was dissected off,

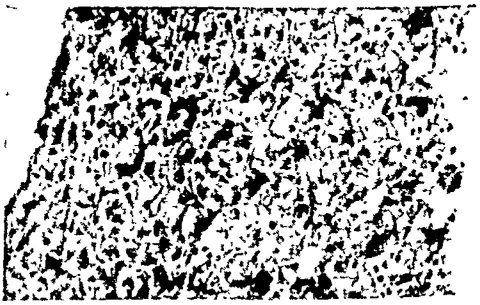

Fig. 2—"Liver-biopsy" specimen (case 2).

renal vein being avulsed during this process. T
died while still on the operating-table but some
the growth had been removed. 8½ pints of
transfused during the operation.

Pathology.—A large yellowish tumour in the
of the right kidney had grown into the second p
duodenum and formed a large polypoid mass. Sect
from the kidney and the duodenum showed the
be a carcinoma of the clear-cell type; the enla
showed secondary deposits of this tumour and
from portal pyæmia. A lymph-node showed no

Case 2.—A man, aged 29, was seen on Oct.
complaining of epigastric pain in short bouts, with
relation to food or any other factors, except that
to come on when he was nervous and hungry.
empty feeling and well localised and had been p
three years on and off. The patient also comp
"stitches" of short duration at both costal ma
after any sudden exertion. He felt weak and was
and tired on exertion.

Family History.—The patient's father had died
cæmia at the age of 44, and his mother of stroke
of 52. His wife, aged 35, was alive and well.

Previous History.—The patient had enjoyed excell
till September, 1941. He had had gynæcomastia
of 13, appendicectomy more than 10 years ago, an
and dengue fevers.

Present Illness.—The patient took part in th
campaign in June–August, 1941. In September,
arrived in Iraq and almost at once developed c
epigastric pain, unrelated to food and worse in the
Food, occasional vomiting, and the taking of alk
no relief. In spite of the pain the patient remained
until March, 1942, when he was investigated at
General Hospital. Barium-meal examination rev

ECT OF PENTAMETHONIUM IODIDE N NORMAL AND HYPERTENSIVE PERSONS

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GISTRAR

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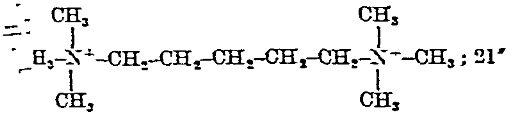
eir investigation of the pharmacological properties homologous series of polymethylene bistrimethyl-ium compounds Paton and Zaimis (1948a and b, found that both the pentamethylene and hexa-ene members paralysed transmission through the mic ganglia.

amethylene bistrimethylammonium di-iodide (now as pentamethonium iodide) has the following a:

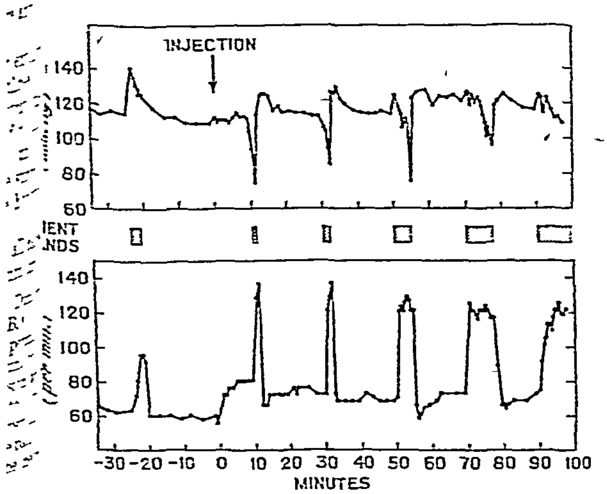


$$H_3-\overset{CH_3}{\underset{CH_3}{N^+}}-CH_2-CH_2-CH_2-CH_2-CH_2-\overset{CH_3}{\underset{CH_3}{N^+}}-CH_3 ; 2I^-$$

white powder, freely soluble in water. The solution le and is sterilisable by autoclaving.

on and Zaimis showed that, in cats, intravenous on of pentamethonium iodide caused relaxation nictitating membrane, excited to contraction by glionic stimulation, but did not alter the effect tganglionic stimulation. It also caused a fall of pressure in cats anæsthetised with chloralose, ect which was inhibited by the previous administra-f nicotine. Pentamethonium iodide prevented the cardia normally produced by stimulation of the eral end of the cut vagus. From these and other s Paton and Zaimis concluded that, in animals, incipal site of the drug's action was at the ganglionic se. Pentamethonium iodide does not stimulate utonomic ganglia and is almost devoid of the sing properties of the higher members of the . In fact, it antagonises the curare-like action of ethonium iodide (Paton and Zaimis 1949, Organe 1949).

a preliminary trial of its action in man, Organe (1949) found that intravenous doses of 20–40 mg. well tolerated. Vasodilatation occurred after the injection; the blood-pressure, in the supine subject, did not fall, but postural hypotension was observed as late as 30 minutes after injection.



—Systolic blood-pressure and pulse-rate in a normal person before after the intravenous injection of 50 mg. of pentamethonium ide, showing the effect of posture. After the injection, the subject od up at intervals, for periods shown in black, until he felt faint had to lie down.

We have been investigating, at the request of the Medical Research Council, the clinical effects and possible uses of pentamethonium iodide. Its action has been studied in normal people, in patients with hypertension, and in patients with peripheral vascular disease. Its effect on the peripheral circulation is the subject of a separate paper (Arnold et al. 1949).

Pentamethonium iodide was used in a solution containing 50 mg. to the millilitre, and was given intravenously in doses ranging from 25 to 100 mg. It was injected within a period of 30 seconds, and the subject remained supine while under observation, except when tested for postural hypotension. It has also been given intramuscularly in doses up to 100 mg.

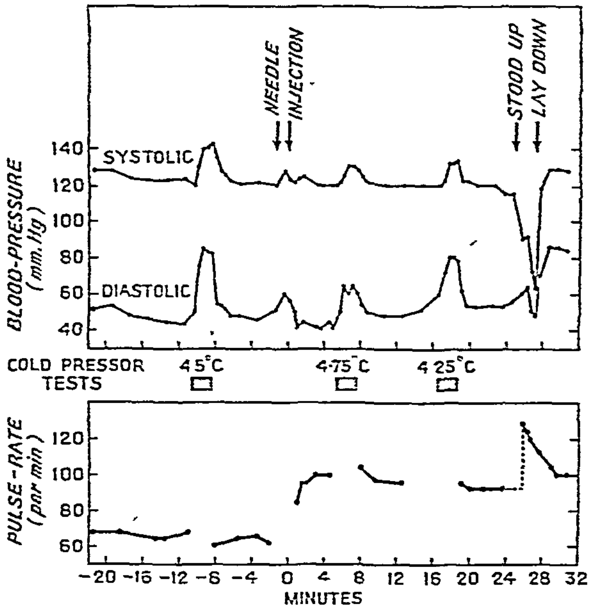


Fig. 2—Blood-pressure and pulse-rate in a normal person before and after the intravenous injection of 60 mg. of pentamethonium iodide, showing the response to immersion of the hand in cold water and to change of posture.

NORMAL PERSONS

In normal persons in the recumbent position intravenous injection of pentamethonium iodide produces no immediate subjective sensation. A transient feeling of warmth or fullness in the head, hands, or feet is occasionally noted within a few minutes of the injection; this is never well marked, and the tingling and coldness felt after injection of tetraethylammonium salts have been notably absent. Accommodation may be slightly impaired but not so much or so constantly as with tetraethylammonium chloride.

Objectively, suffusion of the conjunctivæ is often seen, and slight cyanosis of the lips has been observed on two occasions. Within a minute of the injection the pulse-rate usually increases by some 20–30 beats a minute. Little, if any, change in the blood-pressure occurs unless the erect posture is assumed, when well-marked hypotension results. Postural hypotension can be observed up to 1½ hours after injection (fig. 1). Vasodilatation, as measured by digital and pulse volumes, begins within 2 minutes and is still present 60 minutes after injection. Digital blood-flow and skin temperature also increase (Arnold et al. 1949). Doses up to 70 mg. modify but do not abolish the cold pressor response (fig. 2). The lack of change in blood-pressure after

She had been blind in her right eye for the past fortnight. She had become progressively weaker and more breathless and had lost weight (unknown amount). She had lost her appetite and had been too weak to walk.

On Jan. 8, 1947, there was a tremendous change in the patient. She was now slow, lethargic, and expressionless, and looked thin and very ill. There was complete bilateral external and internal ophthalmoplegia with fixed inactive pupils. There was no appreciation of light by the right eye. No optic atrophy was seen. The vision of the left eye was probably not impaired. Hypersensitivity of left ophthalmic fifth nerve was noted, with slight impairment of sensation of the right ophthalmic fifth nerve to cotton-wool and pinprick. Radiography showed no abnormality in the skull and a poorly defined opacity of the hilum of the left lung, extending towards the periphery. The right eighth rib was partially destroyed in the posterior axillary line, where there was an associated mass of soft tissue. A small diaphragmatic hernia was present on the left side. A carcinoma of bronchus with skull and rib secondaries was diagnosed.

Progress.—The patient's lower jaw muscles became so weak that she could not keep her mouth shut, and she died in coma on Jan. 24.

Necropsy.—The skull contained a soft mass of growth (4 × 3·5 × 3 cm.) apparently centred in the sphenoidal air sinus, whose walls had completely disappeared. The growth had extended rather more towards the right side than the left and had completely surrounded the right 2nd, 3rd, 4th, and 6th nerves. On the left side the 2nd nerve was constricted but not surrounded by growth. The 5th nerve on each side was situated near the margin of the growth, its anterior division, especially the right, being well within the growth. The pituitary was unrecognisable on the soft opaque brownish-red cut surface of the mass, though its stalk was well preserved. The growth had also invaded the dura to appear as a cluster of close-set rounded purplish-red nodules in the medial part of the right middle fossa.

Secondary growth in much enlarged bronchial lymph-nodes at the hilum of the left lung had compressed the left vagus nerve and its recurrent laryngeal branch below the aortic arch and deflected the left phrenic nerve. Microscopy showed carcinoma in the lymphatics around bronchi, near the hilum, and with a recent thrombus in a large pulmonary vein. An ovoid nodule of growth took the place of a length of the right eighth rib, bulging mostly inwards beneath the parietal pleura. The right kidney contained a rounded somewhat lobulated mass which appeared to have penetrated the renal capsule in one area and to have spread into the circumrenal connective tissue. The renal pelvis, renal vein, and inferior vena cava were not invaded. Macroscopically and microscopically this mass was a typical carcinoma of kidney. Some small veins were filled with growth.

Case 4.—A married woman, aged 62, was seen on Sept. 2, 1947, complaining of having had no energy and a poor appetite for the past three months.

Family History.—Her mother and her father had lived to over the age of 70. Her husband and daughter were well. There was no anæmia in the family.

Past History.—The patient had had no serious illness. Before this illness she had always been well and had plenty of energy. There was no evidence of loss of blood from any system. The patient had possibly lost a little weight. Her usual food was a normal mixed diet.

On examination there was definite anæmia, with no jaundice, glandular enlargement, or splenomegaly. The only abnormal sign in the central nervous system was loss of vibration sense in both ankles. The patient was running a continuous fever of 99–100°F with peaks to 103°F.

Investigations.—On Sept. 9, 1947, a blood-count showed red cells 2,000,000 per c.mm., Hb 5·2 g. per 100 ml., M.C.Hb 26 μμg., reticulocytes 5%, and white cells 13,400 per c.mm. (polymorphs 82%, neutrophil myelocytes 0·5%, Turk cells 1%). A histamine test showed a normal gastric secretion of hydrochloric acid. Occult blood was absent from three stools. Barium meal and enema revealed no abnormality. Serum-bilirubin 0·8 mg. per 100 ml. Serum Wassermann reactions negative. Blood-urea 33 mg. per 100 ml. Radiography of lung fields, thorax, dorsilumbar spine, pelvis, and femora showed no abnormality. The urine contained no albumin, cells, casts, or Bence-Jones proteoses.

A further blood-count on Sept. 23 showed a severe red cells 1,730,000 per c.mm., Hb 3·8 g. per 100 normal mean corpuscular volume but decreased content, giving a low mean corpuscular hæmog centration of 25·3% (normal 32–38%). This anæmia occurred despite massive iron and a therapy. Sternal marrow revealed normal cell an abnormal myelo-erythroid ratio of 1 : 1 and an of primitive cells.

Scrutiny of breasts, thyroid gland, and the surface on Sept. 26 revealed no evidence of neoplasm and vaginal examinations were also negative.

Progress.—On Sept. 27, the patient was given a of 4 pints of packed red cells. On Sept. 30, a showed red cells 2,450,000 per c.mm., and Hb 7·5 g. Two weeks later, despite the addition of liver ex folic acid to the iron therapy, Hb was 3·3 g. per and reticulocytes 0·2%. Repeated blood-counts steady fall in the total granulocytes, with an primitive cells and a slight but steady rise in the number of lymphocytes. On Oct. 4 a transfusion of of packed red cells were given. On Oct. 21 a bl showed red cells 1,990,000 per c.mm., Hb 5·85 g. per and white cells 7700 per c.mm. On Oct. 24 the pat in coma, having had generalised convulsions in three days.

Necropsy.—A carcinoma of the upper pole of kidney was found. There was no growth in the re The only affected glands were eight left para-aortic Growth took the place of 90% of the bone-marrow sternum, lumbar vertebræ, and femoar, with only islands of normal red bone-marrow. Both suprarenal were involved. There were a few small subcapsular in the liver. A subarachnoid hæmorrhage was p the lateral surface of the left cerebral hemisphere sylvian fissure; a few very small blood-vessels were bosed in the white matter of the cerebrum deep to and on the opposite side (right). Microscopy s carcinoma of the kidney of an unusual type, having abundant rather cellular stroma and relatively few or acini, with the result that many parts simulated nective-tissue tumour, but definite tubules were p were more obvious in some of the secondaries—e.g., suprarenal glands—than in the primary growth. spindle-shaped cells were present; these were elongated epithelial cells.

SUMMARY

Of 4 cases of carcinoma of the kidney, one p as gastro-intestinal bleeding, one as unexplained megaly, one as a lesion of an internal carotid and one as leuco-erythroblastic anæmia.

In only one of them was there any clinical sug of renal abnormality.

All 4 were misdiagnosed after extensive inve and despite biopsy specimens in three.

This series is presented to illustrate the extrao difficulty there may be both for clinicians pathologists in the diagnosis of a not uncommon ne disease. This is important, since surgical treatm carcinoma of the kidney is more hopeful than t most neoplasms.

Pyelography should be done in all cases where stases are present but no primary tumour can be fo

My thanks are offered to Dr. H. Dunlop (case 1) G. T. Mullally (cases 1 and 2), Dr. L. B. Cole (cases 3 and Sir Lionel Whitby (case 4) for permission to their cases; Mr. N. Lake for his account of the lapa in case 1; Prof. H. Dible for permission to reprodu liver biopsy specimen in case 2; the pathological depa of Westminster Hospital for the necropsy findings in 1 and 2 and all the photographs; and the pathological d ment of Addenbrooke's Hospital for the necropsy fi in cases 3 and 4.

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tion, since subjective sensations, paralysis of dation, and bowel and bladder disturbances ss prominent. The dosage required to produce alent effect seems to be only a tenth of that of lammonium chloride. It is recommended that l intravenous dose should not exceed 40 mg., loses up to 100 mg. have been well tolerated. mmendation is made because signs of collapse asionally accompany a sudden fall in blood- This has been observed in one of our cases been reported (Hewer et al. 1949) in three ised patients in whom pentamethonium iodide n as an antidote to decamethonium iodide. This n be counteracted with adrenaline, which we should always be at hand. Repeated injections necessary.

h pentamethonium iodide is of value in the tion of hypertension, postural hypotension will limit its use in routine treatment. It may,

ION OF EFFECTS OF PENTAMETHONIUM IODIDE, ETHYLAMMONIUM CHLORIDE, AND SECONAL IN SIX TENSIVE PATIENTS

(Blood-pressures in mm. Hg)

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
lood- ə ..	184/92	186/100	194/100	234/116	218/118	252/154
blood- after : thon- lide—						
..	—	—	—	160/100	126/70	220/143
..	—	—	109/60	148/97	—	—
..	90/60	147/90	—	—	102/62	225/139
..	—	—	109/74	127/80	—	—
..	105/63	—	—	—	—	—
..	115/54	124/58	—	—	—	—
hyl- aium e—						
..	—	—	—	—	132/80	—
..	—	153/93	—	133/73	130/68	207/130
..	132/80	—	120/70	—	110/58	—
..	—	150/95	—	—	—	—
..	126/70	—	—	—	114/63	—
r. 4½	—	—	156/80	126/70	118/78	184/122

r, prove of value in the control of hypertensive Pentamethonium iodide is a powerful vaso- and it is in the field of peripheral vascular disease is most likely to be of clinical use.

SUMMARY

amethonium iodide has an action similar to that aethylammonium chloride, but is effective in doses. Judged by the presence of postural nsion and vasodilatation and the persistence of red blood-pressure in hypertensive patients, its after intravenous injection, lasts for at least an

xcessive fall of blood-pressure has been the only toxic effect so far observed, and it has been that this can be counteracted by repeated ns of adrenaline.

hanks are due to Dr. W. D. M. Paton for his advice a supply of pentamethonium iodide. Much of the sed in this investigation was kindly supplied by the ne Foundation.

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ACQUIRED RESISTANCE TO PROGUANIL IN PLASMODIUM FALCIPARUM

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AFTER it had been shown that *Plasmodium gallinaceum*, maintained by serial blood inoculation in chicks, could readily be made resistant to proguanil ('Paludrine') by repeatedly giving subeffective doses of this substance (Bishop and Birkett 1947, Williamson et al. 1947) it became desirable to find out whether proguanil-resistance could similarly be induced in the human malarial parasites. This was shown to be the case with *P. vivax* (Seaton and Lourie 1949) ; in this paper it is shown that the same is true of *P. falciparum*.

A strain of *P. falciparum* was isolated in November, 1947, from a patient who had contracted malaria in West Africa. This patient had been taking proguanil intermittently during his infection, but without apparently increasing the resistance of his parasites to the level of ordinary therapeutic doses, since after he had come under our care a single dose of 300 mg. was sufficient to clear his peripheral blood of demonstrable parasites within twenty-four hours. Blood was taken from this man and inoculated into a neurosyphilitic patient and the strain has since been maintained by intravenous blood inoculation in a series of such patients.

As a rule, proguanil treatment was started in the subinoculated cases as soon as parasites were found in thick blood-films, though in 2 cases (2c and 6) the drug was given for some days before the patients were inoculated. Our aim was to adjust the initial treatment so that the doses given were insufficient to abolish the fever and parasitæmia but sufficient to prevent the development of cerebral malaria. This treatment was usually followed by a ten-day course of daily doses of proguanil, based on the observation by Fairley (1946)

DEVELOPMENT OF RESISTANCE TO PROGUANIL

Cases		Weeks since start of investigation	Initial treatment			Ten-day course		Relapse (days from end of ten-day course	Proguanil (g.) before subinoculation (main-line cases)
Main line	Collateral lines		Proguanil (mg.)	Duration (weeks)	Parasitæmia	Daily dose (mg.)	Last day of parasitæmia		
1		0	100 twice weekly	4	Intermittent	300	2	—†	0·9
	→2a	2	100 twice weekly	2	Continuous	300	2	19	—
	→2b	6	100 twice weekly	3	,,	300	1	None	—
↓ 2c*		8	100 twice weekly	3	,,	600	3	10	6·4
	→2d	9	100 twice weekly	1½	,,	—	—	—†	—
	↓ 3b	11	100 twice weekly	2	,,	300	1	None	—
↓ 3a		13	300 alt. days	1	,,	600	3	18	1·2
↓ 4		16	—†	—	—	1000	2	None	1·4
↓ 5		21	400 twice weekly	4	Continuous	1000	6	10	0·3
↓ 6*		23	100 daily	9	,,	1000	3	None	6·6
↓ 7		32	300 alt. days	4	,,	—†	—	—	3·0
↓ 8		37	300 daily	1½	,,	—†	—	—	5·1
↓ 9		42	300 alt. days	1	,,	—†	—	—	2·4
↓ 10		44	600 daily	2	,,	1000	Present throughout	—†	21·5

* Inoculated with malarial blood *after* proguanil administration had begun.

† Given mepacrine or quinine.

injection, the occurrence of tachycardia, the presence of postural hypotension, and the modification of the cold pressor response are shown in figs. 1 and 2.

HYPERTENSIVE PATIENTS

Pentamethonium iodide was given to fifteen patients with various forms of hypertension in the medical wards and, by Mr. J. G. Dumoulin, to patients with toxæmia of pregnancy. In hypertensive patients a sharp fall of blood-pressure usually follows intravenous injection. This begins within a minute and reaches a maximum within 2–5 minutes. The fall lasts much longer than with tetraethylammonium chloride, and a steady base-line is usually obtained (fig. 3). In a few patients the fall has been observed to persist for several hours (fig. 4). Tachycardia of about the same degree as in normal people usually occurs, and postural hypotension can be demonstrated. The subjective sensations in these hypertensive patients are again far less than with an injection of tetraethylammonium chloride.

In the accompanying table the lowest pressures obtained in six hypertensive patients given various doses of pentamethonium iodide, tetraethylammonium chloride, and 'Seconal' (a rapidly acting barbiturate) are compared. Those patients in whom tetraethylammonium chloride and seconal produce a large fall in blood-pressure also experience a large fall with pentamethonium iodide. A small fall is usually obtained in those whose pressure only falls slightly with the other two drugs. Discrepancies, however, occur, and the effect obtained with pentamethonium iodide is occasionally surprisingly great (cf. case 2). The table also shows the effect of varying the dose of the drugs, and from these and other results it seems that a dose of pentamethonium iodide will produce a fall of blood-pressure similar to that obtained with about ten times the weight of tetraethylammonium chloride. In addition, this response lasts longer (figs. 3 and 4).

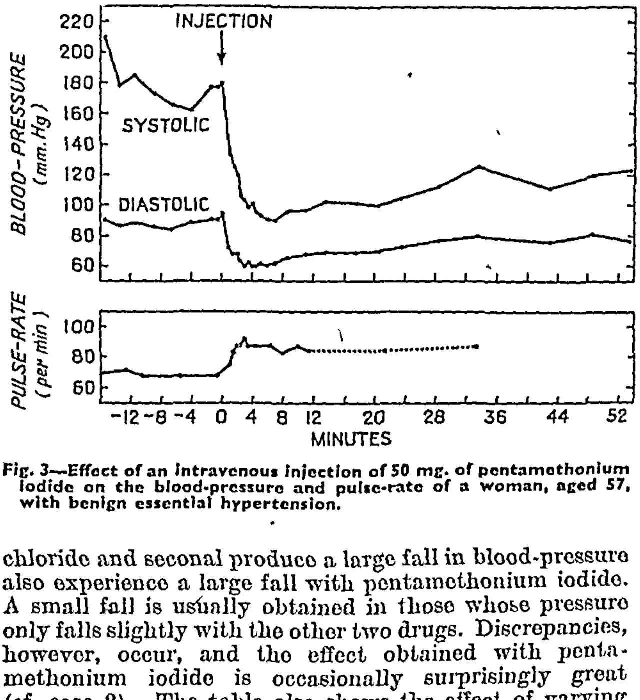


Fig. 3—Effect of an intravenous injection of 50 mg. of pentamethonium iodide on the blood-pressure and pulse-rate of a woman, aged 57, with benign essential hypertension.

Intramuscular injections of pentamethonium iodide have been used in only two cases and produced no local pain and no disturbance of bladder or bowel function. In a patient with chronic nephritis who had a sudden rise in blood-pressure, associated with headache, vomiting, and papillœdema, intramuscular doses, ranging from 20 to 75 mg., lowered the blood-pressure for periods up to 8 hours and relieved the headache. In one other hypertensive patient, with raised intracranial tension, an intravenous injection of 60 mg. produced an immediate fall in cerebrospinal-fluid pressure. Similar results have been reported with tetraethylammonium salts (Lyons et al. 1947), and this aspect of the action

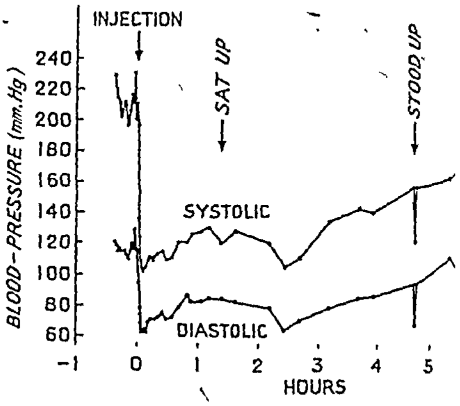


Fig. 4—Protracted effect of an intravenous injection
pentamethonium iodide on the blood-pressure of a wo
with benign essential hypertension.

drugs is under investigation.

TOXIC EFFECTS

In one patient, with toxæmia of pregnancy, fall in blood-pressure was accompanied b This reaction is similar to that occasionally with tetraethylammonium chloride, but such may be more serious with pentamethoni Though the blood-pressure responded well to the lasting action of pentamethonium iodid further fall of pressure requiring repeated in adrenaline (fig. 5). The reaction in this patie a large initial dose (75 mg.), and it is now our start, in any patient, with a dose not exceedi In one other patient, however, an old man with and coronary vascular disease, an initial dose led to a fall in systolic pressure from 134 to 7 though the patient complained of no sympto blood-pressure rose spontaneously. In thre after repeated injections, a maculopapular rash developed. This cleared rapidly, ther *other symptoms suggesting iodism*, and on patients was subsequently given iodides with No other toxic effects have been observed.

DISCUSSION

The results so far obtained, in man, wi methonium iodide confirm that its action is that of the tetraethylammonium salts but potent and lasts longer. It is probably mor

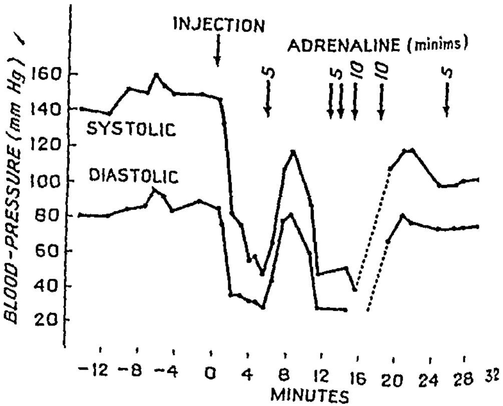


Fig. 5—Effect of an initial intravenous dose of 75 mg. of
iodide in a recumbent patient, aged 27, with pre-eclamptic
The patient collapsed and became semi-conscious as the
pressure reached its minimum. The figure shows the eff
adrenaline (intramuscular or subcutaneous) on the blood-
Note the transitory effect of the first injection of adrenaline.

-DISTRIBUTION OF DIPHTHERIA ANTITOXIN IN NORMAL LOOD SAMPLES FROM GUY'S AND ST. ALFEGE'S ALS, COMPARED WITH THE DISTRIBUTION IN CORD- SAMPLES FROM MOTHERS SCHICK-TESTED DURING ANCY

n values per ml.)	Number of cord-blood samples				
	A	B	C	D	E
0·001	21	29	..	..	..
01	2	0	..	..	..
02	0	0	..	..	..
04	3	2	..	..	..
1	5	3	..	..	..
2	6	2	..	..	..
4	11	16	1	9	13
	15	17	4	14	16
	17	16	11	13	11
	14	8	10	9	5
	3	3	17	2	3
	3	4	6	3	2
	0	0	1	0	0
	0·113	0·0925	..	..	..
c mean	..	..	0·787	0·267	0·209

cord-blood samples at Guy's Hospital; random samples.
cord-blood samples at St. Alfege's Hospital; random mples.
ord-blood samples from Schick-tested mothers at Guy's ospital.
cord-blood samples over 0·04 unit per ml. at Guy's Hospital.
cord-blood samples over 0·04 unit per ml. at St. Alfege's ospital.

l, and at St. Alfege's Hospital, Greenwich, and titoxin titrations at the Wellcome Research tories.

paper deals with items 1 and 2 only, but we have e that babies can be successfully immunised with recipitated toxoid (A.P.T.) starting at the age of s, provided that their passive antitoxin content len below 0·04 unit per ml. Work completed so ws that the presence of 0·1 unit of passive anti- er ml. interferes with active immunisation when t dose of prophylactic was 0·5 ml. of A.P.T. The of active immunisation will be published in ater.

TECHNIQUES

ction of Cord-blood Samples and Blood Samples abies.—In all cases the cord blood was collected he placental end, immediately after division of d and before delivery of the placenta. The anti- was estimated in the serum obtained from these s and from those taken from the mothers.

babies were bled by heel-prick, using a special designed by Mr. F. Tottem, which is detachable he $3 \times {}^3/_8$ inch tube on which it is used, and is sterilised by boiling. The tubes contained potassium e in solution, and the antitoxin was estimated plasma.

itoxin Titrations.—Estimations of antitoxin content made by the guineapig intracutaneous method. working out the distribution of antitoxic values considered sufficient to make titrations at approxi- twofold differences, and such values (see table I) corded as the highest value at which no reaction tained in the test (e.g., a value between 0·5 and 1 rded as 0·5). In the determination of the geometric of groups of figures, each antitoxic value was as the geometric mean of the two limits within it lay (e.g., a value between 0·5 and 1·0 unit is led as 0·707 unit). When accurate estimations required tests were made at 10% differences, and ntitoxic values were calculated by means of a la taking into account the nature of the readings ae intensity of the reactions produced in the guinea- y the different test mixtures. Owing to the small es of blood samples taken from babies, close testing ot possible except in those whose antitoxin content ufficiently high to permit of the testing of a dilution e serum.

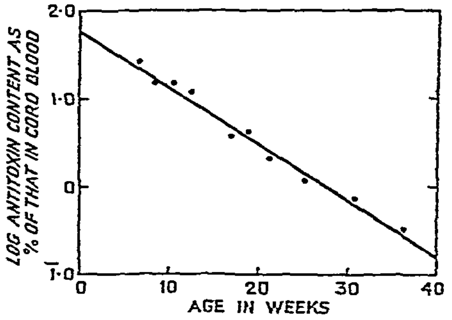
RESULTS

Distribution of Antitoxic Titres

Columns A and B in table I show the general distribution of antitoxic values in samples of cord blood taken at the two south-east London hospitals some 8 miles apart; no Schick tests had been made on these mothers, who represented a random sample of the population. Arranging these values into 7 groups (under 0·004 unit, 0·004 to 0·02, 0·04, 0·1, 0·2, 0·5, 1·0 unit and over) the difference in distribution between the two populations is not significant ($\chi^2 = 5{\cdot}719$; $P = 0{\cdot}46$).

Influence of the Schick Test on Antitoxic Titres

A group of expectant mothers at one of these hospitals was Schick-tested during the 4th month of pregnancy and the positive reactors were immunised with A.P.T. When the cord-blood samples were subsequently titrated for antitoxin, it was found that from 50 tested mothers who had been either Schick-negative (47) or positive-and-pseudo (3) no sample contained less than 0·04 unit per ml. and only one was below 0·1 unit; these women had not been immunised during pregnancy. From one other woman who had been recorded as Schick-negative the cord-blood value was less than 0·001 unit; she was excluded. The results of these 50 titrations are shown in column C of table I. Columns D and E give the values of the first 50 samples tested from populations A and B which contained 0·04 unit or more. The difference between the means of the logs of these values is not significant ($t = 1{\cdot}123$; $P = 0{\cdot}267$) but the difference between the means of the logs of groups C and D is highly significant ($t = 5{\cdot}19$; $P = 0{\cdot}001$). The values given in column C were obtained from women in the same district as those in columns A and D, and there seems to be a strong possibility that the difference between C and D was due to the Schick tests made on group C some months before delivery.



Rate of loss of passively acquired diphtheria antitoxin in babies.

Glenny and Allen[1] showed that the intracutaneous injection of a Schick dose of toxin into guineapigs and rabbits acted as a secondary stimulus and appeared to be as effective as the subcutaneous injection of 1·0 ml. of a toxoid-antitoxin mixture "suitable for human immunisation." In 1926 O'Brien[2] stated that several previously immunised children who had reverted to the Schick-positive state produced more antitoxin and became Schick-negative as a result of the test injection. An experiment has been started by one of us (M. B.) in collaboration with Dr. H. J. Parish with the object of measuring the antitoxic response of adults to a Schick test, and the rate of loss of the antitoxin so produced.

Rate of Loss of Passively Acquired Antitoxin

Fifty samples of cord blood were tested sufficiently closely to give a good indication of antitoxic value. Tests were also made on bleedings taken from the babies 6–38 weeks later. The rate of loss of antitoxin was calculated for each observation by dividing the age in weeks into the difference between the logs of the cord-blood value and that of the baby's blood at the time of

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1. Glenny, A. T., Allen, K. *J. Hyg., Camb.* 1922, 21, 104.
2. O'Brien, R. A. *J. Path. Bact.* 1926, 29, 320.

that 300 mg. of proguanil given daily for ten days was sufficient to cure infections with the New Guinea strains of *P. falciparum* with which he was working, so that in most cases the parasites were subjected to doses of two orders of magnitude. The strain was subinoculated in each case after varying amounts of proguanil had been given so that the parasites were exposed almost continuously to the action of the drug.

The progress of the experiment is shown in the table, from which it can be seen that by the tenth passage the strain was resistant to doses of 1 g. daily for ten days, which is at the upper limit of toleration of the drug. The question when resistance first appeared is more difficult to decide in the absence of any observations on the behaviour of the strain on its first encounter with proguanil, but from the second passage onwards the strain resisted doses of proguanil (100 mg. twice weekly) which we have found are ordinarily sufficient to control natural infections with West African strains of *P. falciparum* seen in Liverpool. But caution is necessary in drawing an analogy between the response to treatment of primary attacks of malignant tertian malaria and the relatively late cases which form a considerable proportion of the naturally infected cases treated by us, for the amount of treatment needed to clear the blood of parasites may be smaller in the later stages of the disease than in the initial attack, as was shown for quinine by James et al. (1932). The response of the strain to the ten-day course of proguanil was normal, in that parasites and fever disappeared before the fourth day, until the fifth passage when parasitæmia continued till the sixth day of treatment. From the seventh passage onwards the strain was unaffected by proguanil, in that parasitæmia persisted during all periods of treatment, though the intensity of the infection was probably to some extent diminished by the drug.

RETENTION OF RESISTANCE ON PASSAGE THROUGH MOSQUITOES

Attempts were made to infect batches of *Anopheles stephensi* on the patients of the eleventh and twelfth passages to determine whether the resistance would survive the sexual cycle of development in the mosquito. Considerable difficulty was experienced in doing this, for in the first two batches of mosquitoes fed the development of the parasites ceased in the oöcyst stage before sporozoite formation had occurred, although neither of these patients had been treated with proguanil. One mosquito of the third batch was found on dissection, sixteen days after the infecting meal, to have sporozoites in its salivary glands; these were inoculated intravenously into a patient, who developed overt malaria ten days later. After a further four days proguanil, 600 mg. daily, was given for three days and then 1000 mg. daily for six days. Parasitæmia continued throughout this ten-day course though on the last day the parasites were very scanty. Fever and heavy parasitæmia recurred four days after the proguanil was stopped, and a course of proguanil, 1000 mg. daily for twelve days, was then begun. The response was peculiar, in that fever and parasitæmia had disappeared by the fifth day but parasites were again detected on the eighth day and fever recurred on the tenth day. On the twelfth day, because of the patient's general condition, mepacrine was given. It is evident that the proguanil resistance was substantially unchanged by mosquito transmission of the strain.

DISCUSSION

The possibility arises of the production of proguanil-resistant strains in the field by inadequate treatment of malignant tertian malaria. At first sight it would seem more likely that this might occur than in benign tertian malaria since the resistance of our strain of *P. falciparum* developed more rapidly and to a higher degree than was
the case with *P. vivax* (Seaton and Lourie 1!
more, the margin between the minimal effe
the dosages ordinarily used in treatment
much smaller in *P. falciparum* than in *P*
tions; consequently the chance of unde
former disease is correspondingly greater.
hand, however, there is the extremely impo
tion (Fairley 1946, Mackerras and Ercol
et al. 1949) of the sterilising effect of
gametocytes, which in the strains of *P. fal*
examined prevented mosquito infection
during the administration of proguanil t
upon whom the mosquitoes are fed and f
afterwards. If these findings are genera
the prospects of the accidental develo
proguanil-resistant strain seem remote.

SUMMARY

A high degree of resistance to proguanil
in a strain of *P. falciparum* by giving sub
of the drug to a series of patients in wh
was maintained by blood-inoculation. T
was unaffected by mosquito transmission.

The accidental production in the field
resistant strains of *P. falciparum* is tho
because of the sterilising effect of the dru
cytes.

We are greatly obliged to Dr. A. O. F. R
Alergant, and Mr. R. Ousby for their coöperatio

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CONCENTRATION OF DIPHT ANTITOXIN IN CORD BL

AND RATE OF LOSS IN BABIE

MOLLIE BARR A. T.
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DURING the early stages of an inves
the best age at which to begin active imm
children against diphtheria, two unexpected
obtained. First, it was found that the a
of the cord blood may be considerably high
of the mother's blood; and secondly there is
that the Schick test has a greater and
effect on antitoxin production than is genera

The object of the work now in progress w
data on the following points:

(1) The distribution of values of diphtheria
the blood of newborn babies, passively
placental transmission. Use was made
blood.
(2) The rate of loss of this antitoxin.
(3) The effect of antitoxin derived from colo
maintenance of passive immunity.
(4) The degree to which the passive antito
with active response to an injection of pro
(5) The age at which babies can respond
active immunisation.

The clinical part of the work has been don
past 2½ years at Salomon's Welfare Ce

lowed them up for a longer time. The course se of undulant fever is unpredictable. Though rage duration can be calculated from an analysis numbers, there is no guarantee that a particular ill conform to this average. Spontaneous rapid y soon after admission to hospital is common and might easily be attributed to the treatment at the time. Relapse after apparent cure and ge from hospital is commoner still.

comparison of large series of cases treated by ove-mentioned methods with similar groups of ted controls has convinced me that the treatments itherto have had little or no influence on the of the infection. Also, some treatments seem to ate or prolong the disease, while others expose tient to unjustified risks.

discovery and introduction of the antibiotic ycin by Duggar (1948) has given rise to new Through the courtesy of Dr. Linton, of the e Laboratories Division of the American Cyanamid ny, I have been able to treat 24 cases of undulant with this new drug, and my results confirm those med by Spink et al. (1948) in Mexico. It is true the number of cases is relatively small and the d of observation so far too short to allow one to k with absolute certainty, but the results have been pressive that a preliminary report is justified.

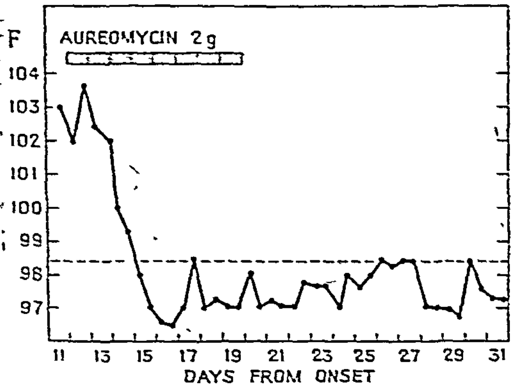

Fig. 1—Effect of aureomycin in case 1.

MATERIAL

series consisted of 12 males and 12 females, of from 11 to 55 years. Of these 24 cases, 7 were of severe or "malignant" type, and 2 patients were st moribund; 9 cases were of the undulatory type hich waves of pyrexia follow one another with or out intermission; 7 were of the continuous febrile , which runs a relatively low but continuous tem- ture for seemingly interminable periods; and the was a case of coxitis, afebrile at the time but with a itive blood-culture. The series was fairly representative he kind of case one encounters in Malta, with a ponderance, perhaps, of the severer types.

METHOD

he time at which treatment was started varied: atient was treated within fifteen days of the onset the infection, 6 patients within the first month, and within the first three months; while in the remaining ases the infection had been present for over six months. 2 of these the disease was over a year old and was l active.

In all but 4 cases the diagnosis was confirmed by ding the brucella in the blood before treatment. nfortunately in 2 cases the culture was contaminated d in the other 2 no growth was obtained.) But in all ese 4 cases the agglutination titre was so high that ere could be no reasonable doubt about the diagnosis.

Aureomycin has the great advantage that it is given by mouth, in capsules containing 250 mg. of the antibiotic. In the first 2 cases the drug was introduced gradually to avoid reactions, and it was not until the fourth day that the full dose of eight capsules (2 g.) was given. As no reactions were observed, and as some of the early cases were so severe that delay might have been fatal, the full dose was given from the start in all subsequent cases. The capsules were given one at a time every three hours. When an attempt was made to give them in twos, so as not to disturb the patients unduly, there were complaints of nausea, abdominal pain, and vomiting. In an attempt to economise the limited supply 2 children aged 11 years were given four instead of eight capsules a day, but the response was unsatisfactory and the dose had to be increased to 2 g. as in adults.

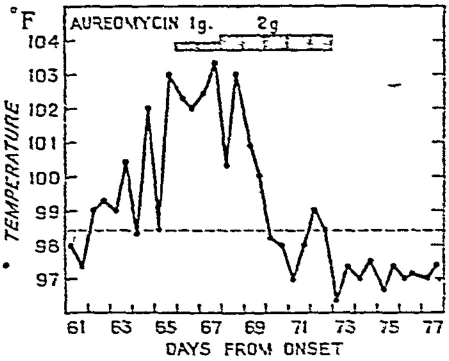

Fig. 2—Effect of aureomycin in case 2.

TOXICITY

There were no serious toxic reactions, though some of the patients were very ill before treatment was started and 2 had chronic nephritis. In some cases there was nausea, and, more rarely, vomiting and abdominal pain: 1 patient had diarrhœa for a day. But these symptoms were slight and insufficient to deter the patient from taking the capsules. Sudden and well-marked elevation of the temperature at the beginning of the treatment, graphically termed "spiking" by Spink et al. (1948), was observed in 3 cases where the temperature had been relatively low. There was a well-marked fall of blood-pressure in 2 of the severe cases, which gave rise to some anxiety at the time, but this might have been due to the severity of the infection. One patient developed urticaria on the tenth day of treatment, but the itching was easily controlled with 'Benadryl.'

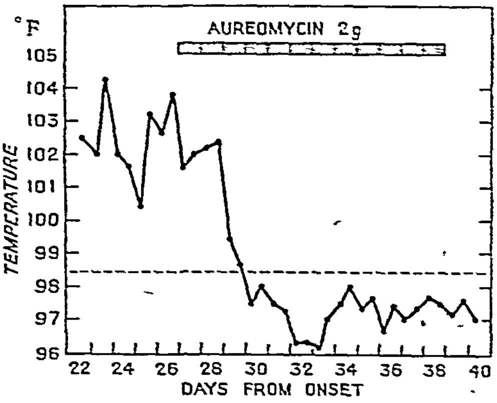

Fig. 3—Effect of aureomycin in case 3.

RESULTS

The immediate response was excellent in all cases. With one exception, in which the dose had to be increased to twelve capsules (2·5 g.), the temperature became subnormal within a maximum of four days after the establishment of the full dose of 2 g. As a rule there

TABLE II—DIPHTHERIA ANTITOXIN CONTENTS OF (A) ANTENATAL SAMPLES OF BLOOD, (B) CORD-BLOOD SAMPLES, (C) SUBSEQUENT BLOOD SAMPLES FROM MOTHERS, AND (D) BABIES' BLOOD

Mother	Antitoxin (units per ml.)				Ratio B/A	Days between samples		
	A	B	C	D		A to B	B to C	B to D
1		1·5	2·7				6	
2	13·5	21·0	11·0		1·78	1	4	
3	22·0	40·0	17·0		1·82	<1	4	
4	4·0	6·25	3·2		1·56	<1	4	
5	3·0	6·7	2·5	2·8	2·23	<1	3	3
6	5·75	11·0	5·25	7·0	1·91	<1	3	3
7	14·0	19·0	14·0	6·0	1·36	<1	5	5
8	0·07	0·12	0·08		1·71	<1	9	
9	5·0	7·5	4·3	4·2	1·50	<1	1	1
10	0·95	0·95	0·90	0·50	1·00	<1	1	1
11	0·01	0·08	0·01		2·00	<1	8	

the observation. The results were grouped together according to the ages of the babies at the time when blood samples were taken, and the average weekly rate of loss determined for successive groups of five observations. The average amount of antitoxin present at the average age of each group was calculated in terms of the amount present in the cord blood. The results so obtained are plotted in the figure, and the best straight line calculated from the data is represented by the formula $\log A_w = \log A_c - 0{\cdot}20 - 0{\cdot}065\ W$, where A_w is the antitoxic value of the blood of a baby w weeks old and A_c is the cord-blood value. The formula shows that there is a steady logarithmic rate of loss of 13·9% per week falling from an initial average value 36·9% below that of the cord blood: the latter is thus 1·58 times the effective value of the babies' blood. On the average the antitoxin in a baby's blood falls to half about every $4^1/_2$ weeks, to a fifth every 11 weeks, and to a tenth every 15 weeks, starting from the initial titre 36·9% below the cord-blood value.

The amounts of diphtheria antitoxin found by titration in the serum of the 50 babies at various ages, arranged in groups of 5, are compared below with the values calculated from the formula given above.

Average Age of Group		*Average Antitoxin Content as Percentage of that in Cord Blood*	
Weeks	*Days*	*Calculated*	*Found*
6	5	23·1	25·1
8	3	17·9	16·2
10	3	13·2	15·3
12	4	9·62	11·4
16	6	5·06	3·78
18	5	3·84	4·23
21	2	2·61	2·13
25	1	1·47	1·18
30	5	0·64	0·74
36	1	0·28	0·31

Concentration of Antitoxin in the Cord Blood

In the early stages of the main experiment it was frequently noticed that the antitoxin content of the cord-blood sample was slightly higher than that of the mother's blood sample taken some weeks earlier, but there was no reason to expect the antitoxic titre to be still rising.

Direct experiments are now being made to compare the antitoxic titre of blood samples taken during labour (A), cord blood (B), and samples from the mother (C) and baby (D) a few days later; the results obtained so far are given in table II. It will be seen that in every instance except one the cord-blood value was considerably higher than that of the mother's serum although in almost all instances the mothers were bled for test less than 12 hours before delivery. The values given in table II all refer to mothers immunised during pregnancy in order to obtain titres sufficiently high to permit of close testing. Sufficient material was available in each case to ensure that the values were tested to an accuracy of well within 10% except those for mothers nos. 8 and 11. The antitoxin content of the babies' blood was in all five instances nearer to that of the mothers' blood
taken at the same time than to the content of
blood. In the two instances of mothers nos. 7
where the baby's antitoxin content was much
the mother's, the ratios of titres between cord
mothers' blood were the lowest recorded.
titre of the baby's serum (*no. 10*) was confirmed
on a further sample of blood taken 7 days la
tests are being made on the blood of babies.

SUMMARY

There was no significant difference in the
of diphtheria antitoxin contents of 100 sample
blood taken from each of two hospitals 8 miles
south-east London.

When expectant mothers were tested
immunised at the 4th month of pregnancy the
mean of the antitoxin content of the subsequ
blood samples from those either Schick-negativ
as positive-and-pseudo was over 0·5 unit per m
than that of the controls selected at random
same hospital.

The antitoxin content of cord blood was ver
ably higher than that of antenatal samples of the
blood taken during labour, and higher than
10 out of 11 samples taken after delivery; in 9 ou
11 cases the contents of the cord samples were
higher than the mother's after delivery.

There is a steady logarithmic rate of loss of
in babies which averages 13·9% per week, fal
an initial average value 36·9% below that of
blood. The average antitoxin content of the
babies 10 days old is half that of the cord blo
sequently the babies lose half their antito
$4^1/_2$ weeks.

We should like to thank Prof. G. Paylin
who stimulated the commencement of this w
with Dr. H. J. Parish, has shown constant
also the staffs of the obstetric departments of S
and Guy's Hospitals for their coöperation; an
larly Miss L. Coombe, superintendent health
Salomon's Welfare Centre, without whose
this investigation could not have been underta

Thanks are also due to Miss F. Anderson
Cripps, Miss D. Delahoy, and Mr. A. Service for
assistance in the antitoxin titrations.

AUREOMYCIN IN UNDULANT F

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THE treatment of undulant fever has alwa
major therapeutic problem in Malta. In spite
ganda to boil milk and the enforcement of c
pasteurisation in certain areas, the disease is s
prevalent. Though the mortality is relatively
infection can be as severe as typhoid fever a
a long illness and a protracted convalescence.
people especially, where spondylitis is almost
there may be more or less permanent crippling

The treatments that have been tried are legi
include vaccines given intramuscularly or intra
filtrates such as melitine and brucellin, n
protein shock from the intravenous injection o
of T.A.B. vaccine, neoarsphenamine, acriflavine,
preparations, and the whole series of the sulph
alone and, lately, in combination with trans
streptomycin.

Though occasional successes have been ob
has been impossible to confirm the successf
reported from time to time. This may have
to the extra virulence and resistance of the loc
of *Brucella melitensis* or more probably to the
we have tried these remedies on larger series

reatment is simple and appears to be safe. It ly be carried out at home. The only drawback it is expensive. I understand that the retail aureomycin in Malta would work out at 5*s.* le, and that a complete treatment would cost ainst this must be set an average of three months' hospital and another three months' invalidism. ed from this point of view the cost does not to be excessive, and one hopes that, as in the enicillin and streptomycin, large-scale production proved technique will soon lower the cost and the supply.

anks are due to the Lederle Laboratories for supplying 2000 capsules of aureomycin free of charge, and to M.O. Malta, who handed me his quota of the drug given me permission to publish this paper. Most bacteriological work was carried out at the Public Laboratory, and I wish to thank Prof. V. Mifsud and gius for their help and coöperation.

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Reviews of Books

hiogenic Carcinoma and Adenoma

M. FRIED, M.D., associate attending physician, ontefiore Hospital, New York. London: Baillière, ndall, and Cox. 1948. Pp. 306. 33*s.*

s well-produced and freely illustrated work is of ular interest at the present time, when an alarming se in the incidence of pulmonary cancer is being ised. Dr. Fried feels that the increase is more ent than real, and is due to such factors as ved diagnostic methods, public-health facilities, awareness."

sification of bronchial carcinoma is by no means but it can follow anatomical or microscopical ters, and conveniently enough these almost de. Assessment of ætiological factors, too. is lt: radon in cobalt mines (Schneeberg) and ium are now under suspicion, while the old rites—tobacco, tar products, silicosis, and viruses—nore or less exonerated for the moment. The al aspect and course occupy several chapters and ried describes fully hypertrophic osteo-arthropathy lation to pulmonary cancer. In a good account perior-sulcus tumours (Pancoast) he admits that most are bronchial carcinomas wedged in the some are derived from bronchial rests. The value of bronchoscopy and sputum-examination tressed and the dangers of aspiration biopsy

Fried notes that radiotherapy rarely gives results, and advocates radical surgery wherever ble. The chapter on bronchial adenomas indicates he regards these, on the whole, as benign urs arising from the basal cells of the bronchial ous membrane or from the mucous glands. A concluding section on mediastinal tumours includes iptions of dermoids, neurogenic tumours, and other entities.

e 118 illustrations are well produced, the photographs being particularly satisfactory. A number lustrative case-reports in each section help to cover cts not fully dealt with in the discussion. The le forms an authoritative work on a subject that is anding increasing attention.

métrites du col

(2nd ed.) P. DUREL, Hôpital Saint-Lazare. Paris: Masson. 1948. Pp. 334. 650 Fr.

this monograph Dr. Durel gives full descrip- us of the pathological anatomy, bacteriology, and tment of the infected cervix. Relatively little is l of symptoms. There is an excellent chapter on the interaction of the diseased cervix and pregnancy. The greater part of the book, however, deals with gonorrhœal infection, and for the gynæcologist who rarely sees overt gonorrhœa its value is correspondingly limited.

Under pathological anatomy the English reader will find much with which he is familiar; but Dr. Durel expands the standard pathological descriptions into an ingenious, though possibly over-elaborate, classification of types. The colposcope diagrams are well thought out, though somewhat crude in execution; indeed, many of the drawn illustrations would be better replaced by photographs and photomicrographs. The full chapters on bacteriology contain much detail on the morphology, staining, and cultural characteristics of the organisms concerned.

Therapeutic measures are discussed in great detail, and the chapters on the use of antibiotic and chemotherapeutic drugs give full details of the physical and chemical characteristics of the different preparations. A section on the use of hormones develops into a discussion of their use in any gynæcological condition fortuitously associated with cervical lesions. Other therapeutic measures described range from the commonly accepted tampons, pessaries, and douches, through intracervical pencils (which are condemned) to methods to which the British reader may not be accustomed—e.g., cervical massage, artificial pyrexia, thermal baths, radioactive waters, and dietetic régimes. There are good chapters on the use of high-frequency currents, including diathermy and coagulation; and here, with his passion for thoroughness, Dr. Durel even includes circuit-wiring diagrams. Conisation by cutting wire is not discussed at all, and the actual cautery and electrocautery receive scant mention. Hysterectomy is only discussed in so far as it is necessary for chronic adnexal disease.

If Dr. Durel intended to cover all current knowledge on appearances, bacteriology, and methods of treatment of cervicitis he has achieved his object; but his chapters are apt to be watertight, and fail to link up appearances, ætiology, and treatment. Only very rarely does he express a clearcut personal opinion on the value of the various treatments.

Child Psychiatry

(2nd ed.) LEO KANNER, M.D., associate professor of psychiatry and of pediatrics, director, children's psychiatry service, Johns Hopkins University and Hospital, Baltimore. Springfield, Ill.: C. C. Thomas. Oxford: Blackwell Scientific Publications. 1948. Pp. 752. 45*s.*

THE second edition of one of the earliest attempts to present child psychiatry systematically is an important event, the more so as the psychobiological school at Johns Hopkins has seemed to many to provide the most "sensible" approach to this controversial subject. In his effort to be comprehensive, even at the expense of depth, Professor Kanner summarily dismisses psychoanalysis, thus (some will feel) discarding any serious examination of the dynamics of the situations he describes. While he gives a balanced account of the influence of heredity, he interprets the psychological disorders of childhood in terms of crude environmental influences, and the profit motive in the child. Even with such a self-imposed limitation, his choice of a purely symptomatic classification is hard to understand, being at odds with the psychobiological appeal, made early in the book, for a holistic approach to the physical, emotional, intellectual, and environmental problems of childhood. It is difficult to preserve the holistic perspective when, in a section entitled Problems of Behaviour, children are sorted out according to symptoms, under the headings of anger, fear, anxiety attacks, and hypochondriasis. In strong contrast to his appeal for unification are his references to the child psychiatrist's natural allies—parents, school-teachers, hospitals, and juvenile courts—which, on the whole, are unfriendly and even sarcastic; while the work of the psychiatric social worker is dismissed in two pages of vague description.

Professor Kanner's critical qualities, ably displayed in comparative studies of the contributions of others, seem to vanish before deeper psychological phenomena. Since his book will inevitably be in demand among was some elevation of temperature on the first day, a sort of hesitation for another day or two, and then a precipitous fall, as can be seen from the following 6 cases:

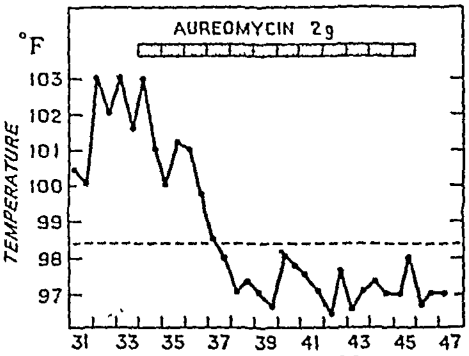

Fig. 4—Effect of aureomycin in case 4.

Case 1.—A woman, aged 47, was admitted to hospital within eleven days of the onset of a very severe "malignant" infection, with toxæmia, delirium, congestion of both lungs, blood-stained *sputum*, albuminuria, and peripheral circulatory failure. She reacted favourably and promptly to aureomycin (fig. 1). Brucella, present in the blood before treatment, disappeared after treatment with aureomycin 2 g. daily for eight days. There was a relapse four weeks later. Blood-culture was again positive, and there was a wave of pyrexia lasting fourteen days, after which the patient recovered spontaneously.

Case 2.—A boy, aged 11 years, with the "undulatory" type of infection, had already had two waves of pyrexia lasting about fourteen days each. Treatment was begun with four capsules (1 g.) daily; but, since the response was not well marked, the dose was increased to 2 g. after two days, after which the temperature came down precipitately (fig. 2). A relapse four weeks later was successfully treated treated with a fuller course.

Case 3.—A man, aged 48, husband of case 1, also had a very severe infection. He was given 24 g. of aureomycin in twelve days (fig. 3). There was no relapse, and the patient was back at work within three weeks of admission to hospital.

Case 4.—A woman, aged 20, with the undulatory type of brucellosis, was in the middle of a wave when aureomycin was started. There was a prompt and satisfactory response (fig. 4).

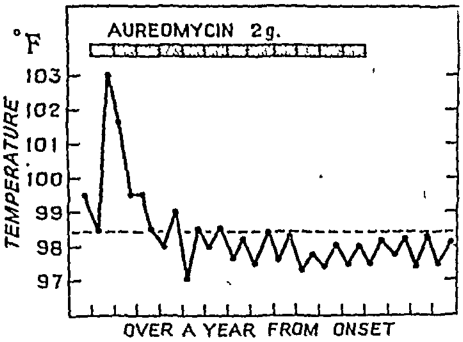

Fig. 5—Effect of aureomycin in case 5.

Case 5.—A woman, aged 24, had had undulant fever for over a year. Her temperature had been subfebrile throughout, with occasional pyrexial waves. Her spleen was enlarged and hard. Blood-culture was positive before treatment. Note "spiking" at the beginning of treatment (fig. 5). After a course of aureomycin, blood-culture was negative and the temperature remained normal.

Case 6.—A woman, aged 28, had been ill for six weeks. Blood-culture was positive before treatment. After a preliminary hesitation, her temperature came down rapidly and has remained low.

The fall in temperature was often preceded by an improvement in the general condition, a clearing of the pulmonary congestion, and an increase in appetite, and was followed by a more gradual reduction in the size of the spleen.

In the first part of the experiment, which included 14 cases, treatment was continued for eight days, and the average total dose of aureomycin was 16 g. Since the supply of aureomycin was so limited, and the of patients clamouring for it so great, it was that this would be sufficient. This economy, proved to be a mistake, and 4 of the cases In 1, a very chronic case of 18 months' duratio plicated by spondylitis and abscess formation, and the fever reappeared ten days later. In the there was a relapse after four, five, and seven In the second part of the experiment treatment from twelve to fourteen days, and so far (minimum of observation is eight weeks) there have been no in the 10 cases.

An important and pleasing feature is that patients treated with aureomycin have been fr the rheumatism which so often complicates th valescent stage and can be as troublesome as the In 2 cases where rheumatism was present before ment (a case of coxitis and another of sacro-iliac with unmistakable radiological changes) the pa eased almost at once and recovery was greatly ac

The blood was cultured immediately after the ment in all cases. It was sterile in all except the boy aged 11 years, whose treatment had been with 1 g. a day.

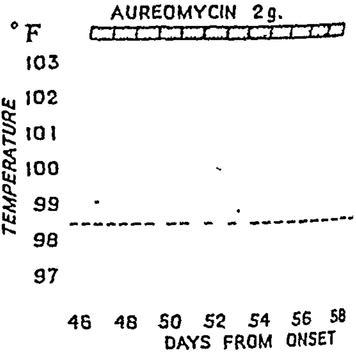

Fig. 6—Effect of aureomycin in ca

This boy relapsed after five weeks and received a second and fuller course of aureomycin without developing any allergic reaction and with a completely satisfactory result. Blood-culture was repeated at intervals of three or four weeks, and the are still being kept under observation in the out *department. In case 1 the brucella reappeared* occasion of a relapse four weeks after the end first treatment. In the other 2 relapses the blood remained negative.

The agglutination titre continued to rise i cases where it was low. The erythrocyte-sedime rate behaved erratically, as it does in untreate The leucocyte-count improved rapidly from the be and in most cases the leucopenia had disappeared four weeks. There was no evidence of any des of blood or aplasia, and the red cells and hæm returned to normal with the improvement in the condition.

So far as one can judge from the limited nu cases, there was no difference in response recent and old infections. Curiously enough th that relapsed included the oldest and the most infections.

CONCLUSION

After a long and disappointing experience treatment of undulant fever one cannot help somewhat *cautious in expressing* one's opinion. withstanding this, the results have been so co so rapid, and even dramatic that it is imposs deny that aureomycin has a specific action on *melitensis* in vivo. It is too early to say whethe eradicate the infection completely and for all tim cases, but it is certainly the only effective re have used so far. The failures can be attrib [illegible] and much work remains to [illegible] dose. It may also happen th strains of brucella may become resistant to aure

RATIONALISATION

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students, psychiatrists in training, and pædiatricians, they should be aware that the superficial "common sense" approach may mask an underlying poverty of inquiry into causation. We still cannot predict confidently that a particular type of reaction will be shown by a known child in a given set of circumstances; nor do we know why a certain child falls ill in one way while another child of comparable antecedents, subject to similar environmental influences, will react differently. The elucidation of these mysteries is a task of paramount importance to child psychiatrists of all schools.

Where there is little inquiry below the surface, treatment methods must rely on manipulation of the environment alone. This book, painstaking and thoroughly readable though it is, leaves too many questions open; and induces a mood of disappointment.

Sex in Social Life

Editor: SYBIL NEVILLE-ROLFE, O.B.E. London: Allen & Unwin. 1949. Pp. 506. 21*s*.

THIS symposium on the sociology of sex was ready for the press at the outbreak of war, and now appears in a revised form. Of the experts who contribute, those whose concern is with the scientific background are most at their ease, Dr. C. H. Waddington on sexual biology and Dr. M. Fortes on comparative anthropology being outstanding. In the sections dealing with hygiene and ethics, one occasionally longs for the horse-sense of certain other works. There are passages in which insufficient citation of evidence and confusion of fact with opinion diminish the authority of the writers, but in general the standard is high, though not equal to that of at least one recent American symposium. In books of this kind, the intended audience must at all costs be kept in mind; and to describe *Trep. pallidum*, for instance, as "a worm-like organism," or to state that venereal diseases are commonly contracted without promiscuity, though safe enough in the presence of a trained audience, is to court definite risks in public hygiene teaching. It would, however, be ungenerous to carp at a book which many will find informative and helpful, and which represents a sincere attempt to state the scientific background of a rational sexual ethic.

Progress in Allergy

Vol. II. Editor: PAUL KALLOS. Basle: Karger. 1949. Pp. 356. Sw. fr. 36.

THE first volume of this work appeared before the war under the editorship of Paul Kallos. The second volume resembles the first in having many contributors, but differs from it in being mainly in English instead of German. Since the editor has allowed each author to express his own views, there is not always absolute agreement. They discuss the immunological, chemical, and therapeutic aspects of recent advances in allergy, using the term in the sense given it by von Pirquet.

G. L. Waldbott surveys the ætiological causes of urticaria. He points out how difficult it is to determine the cause in many cases, especially when it is the residue of a long-persisting serum-sickness in which there are none of the usual landmarks of allergic disease. Drug sensitivity (e.g., aspirin) is common in the non-reactor group; but not everyone will agree with his assertion that pollen is as important as food as a cause of urticaria.

F. A. Simon's experimental evidence of the sensitivity of patients to human dander may throw light on the problem presented by the infant with eczema or seborrhœa. It is difficult to know where experimental findings can fit in with the clinical picture, for it was shown that a patient could have positive skin-reactions and circulating reagins for an allergen present in the epidermis of her thigh and her own scalp. Even a newborn infant has allergens in the epidermis. Scratching may therefore be harmful not only because it causes trauma, but also because it favours auto-inoculation.

Professor Haxthausen, too, suggests that the exacerbations of eczema may not be due primarily to antigen-antibody reactions but may be secondary to irritation and scratching. Positive skin-tests of urticarial type are often found in eczematous patients; yet it is urticaria or asthma and not eczema that results from an overdose of the an difficulty is that there are many causes, known an specific and non-specific, which influence an allergi

Animals may be sensitised to bacterial antig tuberculin type or show an immediate response t products like brucella polysaccharide. Dogs, lil can as easily be sensitised to ascaris antigen; but F. who reviews the subject of allergic diseases in a the first to demonstrate spontaneous allergy (a dog which had seasonal hay-fever.

Foster Kennedy postulates that the den diseases, including disseminated sclerosis, have an antigen-antibody upset. Many cases of transien retrobulbar neuritis, peripheral-nerve involveme headache, and migraine, and some cases of epileps with symptoms of an oversensitiveness to prote

E. A. Kabat epitomises the recent advances i chemistry; and aerosol, bronchoscopic, and ant therapy are well summarised.

One small criticism of this valuable w justified. The publishers have not allowed for each reference, and it is most difficult the non-alphabetical jumble which appears of most articles.

Kayne, Pagel, and O'Shaughnessy's I Tuberculosis

(2nd ed.) Editors: WALTER PAGEL, M.D.; SIMMONDS, M.D.; N. MACDONALD, M.D.; F.R.C.S. London: Oxford University Pr Pp. 720. 63*s*.

THE new edition of this textbook is inscri memory of two of the original authors, D Kayne and Mr. Laurence O'Shaughnessy, died since the first edition appeared ten year revising it, Dr. Pagel has been assisted Simmonds, Dr. MacDonald, and Mr. Fatti.

Recent work has made it necessary to alte considerably, and the book is 160 pages long predecessor. It is a sound account of mode and practice, and carries a good bibliogra arrangement remains the same, under the h pathology, diagnosis, prognosis, management all aspects of treatment), and epidemiology a tion. Two appendices cover classification present state of knowledge of streptomycin chemotherapeutic agents. The section on which includes the evolution of tuberculosi occupies considerably more space than any oth but the account is so detailed, well docum beautifully illustrated that the lack of balanc forgiven. Modern methods of diagnosis described, though the statement that inspec reveal a pronounced emphysematous ches not have been made without qualification. T forms of collapse therapy occupy many l accounts of immunisation with B.C.G. and the v form an important part of the section on l The authors urge the need for a clean milk rural areas but claim that the building up of negative herds on a large scale is impract Denmark and the United States, however, it l been accomplished.

An Introduction to Medical Psychology

L. ERWIN WEXBERG, M.D., director, bureau hygiene, District of Columbia. London: Medical Books. 1948. Pp. 171. 17*s*. 6*d*.

THE eclipse of Alfred Adler's "individual ps seems to have prolonged itself sufficiently to b as extinction. Dr. Wexberg, however, shov series of lectures delivered to medical stuc Adler's theory of dynamic psychology can into a body of teaching which takes accoun points of view and more recent studies. contains six chapters—ranging from Indiv Community to Methods and Techniques Psychology—and will commend itself to dislike psycho-analysis but want something from psychology which they can call medical ps inevitably they get something respectable. fashioned.

THE LANCET

VDON: SATURDAY, AUGUST 20, 1949

Mind and Brain

LY there have been several fresh attacks on ennial problem of the brain-mind relationship. s organised by the B.B.C., which produced in rd Programme a series of talks on the Physical f Mind. To Sir CHARLES SHERRINGTON, who the discussion, the physical changes in the nd the mental phenomena which accompany re separated by a gulf that seems at present geable. "It is a far cry," he said, "from an al reaction in the brain to suddenly seeing the around one, with all its distances, its colours aroscuro. . . . ARISTOTLE, 2000 years ago, was how is the mind attached to the body. We are that question still."[1] Prof. E. D. ADRIAN was ır from optimistic about our prospects of ing the relation between the brain and the "The real trouble," he said, "comes from the that there may be an important part of ture which can never be fitted in, however long y work at it."[2] An anonymous neurologist,[3] er, was hopeful that new knowledge might from a parallel advance in physiology and logy. He pointed out that a rat can be trained gnise a triangle and to distinguish it from a or circle. Such a rat, therefore, may be said ware of triangularity. This implies a process in rvous system by means of which a rat recognises igle and which is of the same kind as that by a human being recognises a word. This neural s, common to both animals and man, is the of abstract thought. The neurophysiological ation of speech and thought can be interpreted n terms of electrical patterns in the nervous n organised both in space and time, and comnsion of the brain-mind relationship will when we can understand the part played by patterns. If one looks at a tapestry through a ifying-glass one sees the individual threads but e pattern: from a distance one sees the pattern t the threads. He suggested that in the nervous n we are looking at the threads, while with the we perceive the pattern, and that one day we discover how the patterns are made out of the ds.

e series concluded with the contributions of three sophers,[4] Lord SAMUEL, Prof. A. J. AYER, and GILBERT RYLE. Lord SAMUEL, who accepted ualist hypothesis, had to admit that he saw no ion of the problem. Professor AYER's solution was y that the problem does not exist, or, at least, it is merely the product of the terms we use. The iologist's story is complete in itself: so, too, is the psychologist's. But they will not mix. "Each is an interpretation of certain phenomena and they are connected by the fact that, in certain conditions, when one of them is true, the other is true also." His conclusion was "that mind and body are not to be conceived as two disparate entities between which we have to make, or find, some sort of amphibious bridge, but that talking about minds and talking about bodies are different ways of classifying and interpreting our experiences. . . . Once we are freed from the Cartesian fallacy of regarding minds as immaterial substances, I do not think that the discovery of casual connexions between what we choose to describe respectively as mental and physical occurrences implies anything by which we need to be perplexed." Here Professor AYER seems to be adopting a materialistic monism and to imply that the physiological and the psychological are two different ways of looking at the same thing, from without and from within as it were. Professor RYLE also appears to be a monist since he complains that the difficulties all arise from the attempt to explain human behaviour in terms of the two entities mind and matter. Everything would be much simpler, he thinks, if both these terms were dropped.

This series of broadcast talks aroused wide interest and had educational and possibly even entertainment value. They were not perhaps very likely to go much further than ARISTOTLE. Like a somewhat uncoördinated attack on a wide front between allies speaking different languages and using dissimilar weapons, the engagement resulted in no striking advance. The physiologists and neurologists may, indeed, have been left with the feeling that the philosophers evaded the issue; for even if the whole problem is a matter of terminology, this statement does not really make it any easier for us to understand the relation between one experience, which perhaps wrongly we term physical, and another to which we erroneously apply the epithet mental.

N. WIENER has invented the term cybernetics[5] to describe the study of those problems he believes to be common to certain electrical machines and the nervous system. The development of electrical computing and statistical machines has led to the discovery that such machines are able to perform many tasks of which hitherto the human mind alone was thought to be capable. If the machine and the brain carry out these performances in fundamentally the same way, the machine may throw light on the organisation of the nervous system. At a comparatively low level, self-regulating mechanisms, such as the feedback, which are utilised in mechanical as well as in electrical machines, seem to be paralleled in the nervous system by the processes which regulate and graduate voluntary movement and which are manifestly disordered in patients suffering from tabes dorsalis or from lesions of the cerebellum. At a higher level the machine can be constructed so as to possess something equivalent to memory and to be capable of acts of abstraction which generate something which finds a mental equivalent in an idea or a universal. WIENER is careful to say that the mechanical process is not necessarily identical with the cerebral process, but that the machine's performance is a model of

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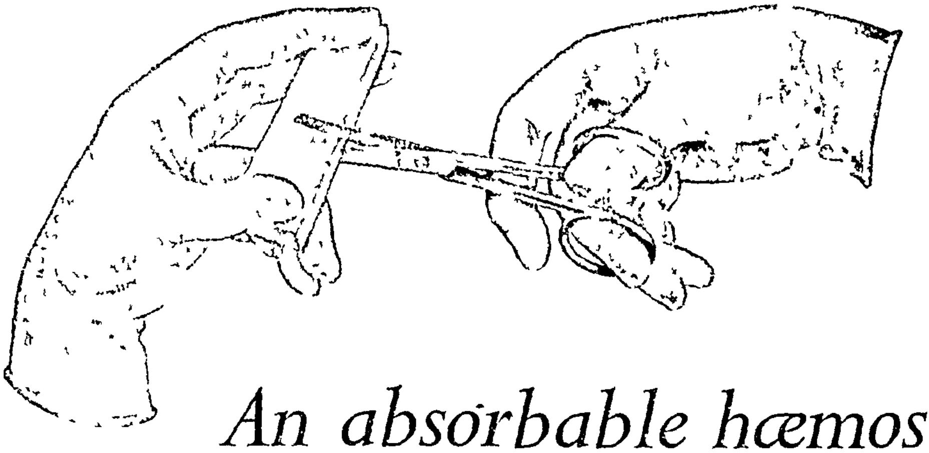
[1] *Listener*, May 5.
[2] *Ibid*, May 19.
[3] *Ibid*, June 16.
[4] *Ibid*, June 30.

[5] Cybernetics. New York, 1948.



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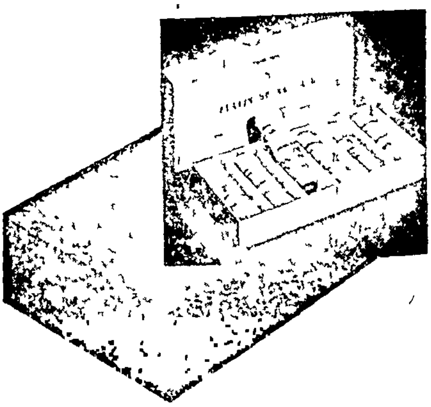

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mustard in prolonging the life of mice with phoid leukæmia AK4. This effect was seen hen the drug was given in the maximum d doses and was about the same as that ig treatment with 4-amino N^{10} methyl- glutamic acid. (This latter compound is an ic-acid-drug which may be more active than terin.) Lately a new purine antagonist has und by study of the nutrition of *Tetrahymena* micro-organism which requires both guanine acil for growth. Experiments showed that o-7-hydroxy-1-H-v-triazolo-[d]pyrimidine. is called guanazolo because it is a guanine ıe, is a powerful inhibitor of the growth of ganism. Guanazolo was tested in mice and to inhibit the growth of a rapidly growing anted adenocarcinoma.[7]

study of growth inhibitors analogous to natural onstituents has thus led to the discovery of al compounds which are at least of interest palliative treatment of leukæmia and cancer. ne of investigation is being followed and may the discovery of drugs of real clinical value in ant disease.

Cobalt and Red Cells

idea that some of the less common metals nportant in erythropoiesis is one that has ared at intervals for many years. It was ntly invoked to explain the occasional failures n to restore a normal blood-count; but we now that, in man at least, the true explanation ally poor absorption from the alimentary tract haustion of iron stores in the body. **Elvehjem**[8] is co-workers demonstrated that in rats, made ic by living only on milk, hæmoglobin would rate more rapidly on a mixture of iron and r than on iron alone: but no similarly convincing ıce has ever been produced to show that the of hæmoglobin regeneration in human iron- ncy anæmia improves if, in addition to iron, ve copper, manganese, nickel, or molybdenum, often recommended.

case of cobalt is different; for cobalt deficiency own to be responsible for an anæmic disease of and cattle in various parts of the world (described bush sickness" or "enzoötic marasmus"), and also known that in animals cobalt salts can e a polycythæmia largely due to an increase mass of circulating red cells. Thus **Wintrobe** ıis colleagues[9] gave cobalt salts to rats which developed anæmia after sterile injections of ntine had been used to produce a local inflam- n: not only was the anæmia abolished but of the rats became polycythæmic. On the hand evidence about cobalt as a stimulator ıman erythropoiesis has been little better than about other related metals, and it is therefore esting to have some further information about its n in man. In 1947 **Weissbecker** and **Maurer**[10] ted the results of giving a daily dose of 500 mg. baltous chloride by mouth to normal subjects: all showed a reticulocyte response, which was followed by increases in the red-cell count, the hæmoglobin, and the circulating red-cell mass: but doses of this order proved unpleasantly toxic. **Robinson, James**, and **Kark**[11] have now studied the effect of long-continued oral administration of cobalt to 9 patients with chronic sepsis—patients who had been injured by war explosions or in car accidents. They used much smaller doses (20–60 mg. daily of cobaltous chloride) and gave them for two to eleven weeks. None of the patients had severe anæmia: the lowest count was 3,420,000 red cells per c.mm. with 11·0 g. hæmoglobin per 100 ml.: none were given any other form of hæmatinic treatment, but all were well fed —by American standards. A reticulocyte response not exceeding 5% occurred between the sixth and tenth day, and thereafter the patients, with one exception, showed increased red cells, hæmoglobin, and circulating total hæmoglobin; in the cases quoted, where the patient had 60 mg. daily for four weeks, the red cells rose to 5,190,000 per c.mm., the hæmoglobin to 13·5 g. per 100 ml., and the total circulating hæmoglobin from 470 to 670 g. The only untoward symptom was slight loss of appetite in 2 patients. Of a larger group of similarly affected patients who were watched as controls, none showed increases in blood values while the suppuration persisted.

Berk, Burchenal, and **Castle**[12] have approached the problem differently. They first gave cobalt to a group of 17 convalescent patients who were not anæmic. By experiment, the most effective dose was found to be 300 mg. of cobaltous chloride by mouth, on which most of the patients showed a reticulocyte response about the tenth day, with a rise in red cells and hæmoglobin. The only evidence of toxicity was loss of appetite, but the red cells of one patient who had been treated for eleven weeks rose to nearly 7 million per c.mm. and it was considered advisable to reduce this by venesection. Previous reports having been thus confirmed, they went on to observe the effect of this dose in 32 patients with anæmias that were refractory to the usual treatment—most of them secondary to leukæmia, nephritis, or other conditions. The results were mainly negative: it was particularly disappointing that 5 patients with primary refractory anæmia and a hypercellular bone-marrow showed no response at all. Of 5 patients with anæmia associated with chronic infection, 2 showed a rise in blood values after four weeks. The only notable success was in a leukæmic patient receiving nitrogen-mustard treatment who after two months' cobalt therapy responded much better to blood-transfusion. After this experience the investigators are understandably cautious about the value of cobalt in the treatment of anæmia. They think that in chronic infections the benefit accruing from a rise in hæmoglobin may be offset by the loss of appetite. They see no indication that cobalt is useful as an adjuvant to iron or liver treatment, and their observations on pernicious anæmia suggest that in patients with achlorhydria it may give rise to serious symptoms.

There is reason to think that cobalt acts by forming oxygen-binding complexes with amino-acids such as

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the way in which the brain may possibly work. Whether we should call the new point of view materialistic, he said, is largely a question of words: "The ascendancy of matter characterises a phase of 19th-century physics far more than the present age, and 'materialism' has come to be but little more than a loose synonym for 'mechanism.' In fact, the whole mechanist-vitalist controversy has been relegated to the limbo of badly posed questions." In this he seems to agree with Professor AYER.

A remarkable book[6] has just been published by ARTHUR KOESTLER, hitherto better known as a novelist than as a writer on neurology and psychology. "Artists treat facts as stimuli for imagination," he writes, "whereas scientists use imagination to coördinate facts. The aim of this book is, first, to show that such distinctions are not fundamental, that all the creative activities of man are based on a common pattern, and to present a unifying theory of humour, art and discovery, in which these are shown to differ merely in degree and not in kind. Secondly, the attempt is made to show the possibility of a system of ethics which is neither utilitarian nor dogmatic, but derived from the same integrative tendency in the evolutionary process to which the creative activities of art and discovery are traced." KOESTLER begins with an analysis of the nature of the comic. Laughter, he maintains, whatever its immediate cause, is always the result of the intersection of two planes of experience. From the simplest pun to the most complex humorous narrative there is always a double entendre. In this he was anticipated by HUGHLINGS JACKSON who described punning as "mental diplopia." KOESTLER calls this intersection of planes of thought "bisociation," and he explains that "the abrupt transfer of a train of thought from one operative field to another leads to its separation from its original emotional change." In this connexion he discusses the neurophysiology of emotion and points out that "emotional processes have a greater inertia than cognitive processes." It is this that renders a psychophysiological discharging process biologically valuable. Thus a "self-transcending" line of thought may discharge the emotion generated by an aggressive impulse. This leads to an analysis of the social aspects of these impulses in a society which gives insufficient scope to self-transcendence. Finally, he applies his theory to the creative impulse in scientific discovery and in art, and accords to art a special rôle in providing occasions for self-transcendence.

This age suffers from having a culture which is literally incoherent, because it is divided into specialties that so far are largely unrelated to each other. KOESTLER's theory may at times be over-simplified: this volume in any case is introductory, and a second is promised. His great virtue, however, is that his philosophy is integrative. The value today of a bold attempt to bring together thought and feeling can hardly be overestimated. In addition, he uses neurology and psychology to illuminate each other. Both these syntheses are contributions to the new renaissance—that rebirth of a comprehensive system of thought in which the present generation has to play the painful bisociative part of mother and child, fire and phœnix.

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[6] Insight and Outlook. Macmillan, 1949.

Growth-factor Analogues in Cancer T

THE hypothesis that some therapeutic
by competitive inhibition has been widely
during the last ten years and has been th
point of searches for new remedies for ba
protozoal infections. It is therefore not
that growth-factor analogues should be
activity against cancer. An early examp
investigation was the use of malonic acid—
product of the intermediary metabolism of
hyde and a known inhibitor of succinic deh
—which was found to retard the growth of s
mammary cancers in mice.[1]

The recent extensive work on pterins re
with the observation that, whereas naturally
folic acid inhibits the growth of cancer
synthetic folic acid has no inhibitory ac
difference was shown to be due to pol
pteroic acids, such as teropterin, which
interfere with the action of folic acid (mo
pteroic acid). Though teropterin proved
against cancer in man, other derivative
amethopterin (a methyl-folic acid) and an
(4-amino-pteroylglutamic acid),[3] have give
ting results in the treatment of acute
Aminopterin is a pterin in which a hydr
of folic acid is replaced by an amino grou
is one of the most toxic of synthetic compo
about twice as toxic, on a weight basis, as h
acid. Used clinically, it has produced re
acute leukæmia of children and has u
prolonged life in a number of cases. This is
larly interesting lead, because so little can
be done for patients with acute leukæmia, a
compounds of this type with similar t
action but with less toxicity may prove v
this disease. Meanwhile a constituent of th
molecule, p-aminobenzoic acid, has been
have a leucopenic action when given to p
large doses—perhaps because p-aminobe
in high concentration has an anti-folic-ac
When given in small doses p-aminobenzoic
increase the biosynthesis of folic acid its
high concentration it might occupy and
active centres normally taken by the large
molecule.

As tumours contain relatively high conc
of nucleic acid, and of the purine and p
constituents of nucleic acids, it is probable
substances are of great importance for t
of malignant cells. Though they are
essential for both normal and malignant
have been used as the basis for designing in
tumour growth. The first compound of thi
be found effective was 2 : 6 diaminopuri
had been shown to act as an antagonist to
in the metabolism of *Lactobacillus casei*. T
derivative has been found[6] more effect

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dency of Prof. Gunnar Holmgren. The trans- of this conference, which have recently been l as a supplement (no. 76) of the *Acta Oto- gea,* include a survey of the present status of in the United States, international standards metry, and the relation between otology and A short account of the second conference, is held last month in London, is given on p. 356. intended that this conference should, in any e over the work of existing professional bodies, ponsors hope that it will continue as a means of together, quite informally, all scientists who are d in hearing, deafness, and speech. The rapid made in recent years in electro-acoustics and nedical and surgical management of deafness is believed, best be consolidated through an tion that already comprises workers from more een different countries.

knowledge of electro-acoustics has turned us vorld of listeners; and whether we listen for ment, for entertainment, or for want of some- tter to do, good hearing and good hearing condi- of greater moment to us all, in our everyday n ever before. It is estimated that not less than e population are hard of hearing and, in addition, n be but few who do not sometimes wish that stic quality of what they are listening to could be d. Audiology, then, though it may be a new not a new science, but rather a means of bringing scientists with a common interest in hearing— ct that concerns us all. As such, it deserves port.

THE WAY THE MONEY GOES

ES being the season of mellow fruitfulness these the days of reckoning. Finance is in the air, ide and outside hospitals the question is being how the accounts for large bodies entrusted with noney can best be kept. Last year the Public ts Committee suggested that the Government's ture on universities and colleges might more iately be covered by statutory authority than Annual Appropriation Act. The Treasury that there were strong reasons against this, nted out that it had never been "the policy of any ment that the universities should be subject to y regulations or that academic policy should trolled by the State." Furthermore, academic ds on the maintenance of which grants must d, are hardly susceptible of statutory definition, n a formula be easily devised which would tically measure the help needed. The uni- s themselves were apprehensive of any encroach- n their present position, and the Government tisfied that the present arrangements reconciled ity autonomy with the need to safeguard public

In their report for 1948–49, which has just ed,[1] the committee admit that they are impressed e arguments. But there are no detailed accounts increasingly large sums involved—the universities over £17½ million this year as compared with der £12½ million last year—and the committee hat the Treasury will consider whether, without ng the independence of the universities, further can be suggested to assure Parliament that the are wisely used.

committee also considered the finances of eleven ided bodies ranging from the Arts Council of Britain to the Medical Research Council. They whether the time has not come when these should be converted into ordinary departments to normal Parliamentary control. If it is wished ntain their independence for the time being, the ttee recommend that their accounts should be made more informative. It should, for instance, be possible to compare the estimate for each main item of expenditure on which the provision for the grant is based with the figures in the account. The Treasury agree that there should be no difficulty in arranging this.

The tendency for Government assistance to dry up voluntary financial effort is noted with regret. "The degree of Government control must depend on the proportion of Government grant to total income, and the independence of these bodies, which is itself one of the main justifications of the grant-in-aid system, must be impaired if they are wholly or mainly dependent on Government grants." The committee therefore suggest that voluntary subscriptions should be stimulated either by limiting the duration of these grants or by making them proportionate to the subscriptions forthcoming. To spend money wisely is never as easy as it appears, and this report adumbrates some of the peculiar difficulties of spending public money. But the independence of our universities and scientific bodies has a value that is not shown in a profit-and-loss account, and money is not always best spent when we know most clearly what it has bought.

BILHARZIAL FILMS

BILHARZIASIS is one of the most serious debilitating chronic diseases, widely endemic throughout the more populous parts of Africa. Yet few educational films for doctor or layman have been made describing the disease and its ravages. The more welcome are two new films prepared for the government of Southern Rhodesia, which had their première in England before a distinguished audience at the London School of Hygiene and Tropical Medicine on June 30.

Vesical schistosomiasis has been known to exist in Egypt since 1200 B.C.; but not until 1851, when Professor Bilharz, who then occupied the chair in zoology at the University of Cairo, discovered the parasite in human cases was the cause of the disease made known. Another 65 years passed before Professor Leiper made clear the remarkable channels and stages in the life cycle and development and in the transmission of the parasite from man to man. It was in 1915 too that specific treatment for bilharziasis with antimony was first discovered. Epidemics of bilharzial hæmaturia affected Napoleon's troops in Egypt, British troops in the South African War, and Empire soldiers serving in various parts of Africa in the 1914 and 1939 wars. Recent estimates of the incidence of bilharziasis among civil populations indicate that half of the population living in the lowest and widest parts of the Nile Delta suffer from *B. hæmatobium* infestation. Although Egypt is the most severely affected country in the Middle East the disease has also been recognised in the past 50 years among the inhabitants of villages bordering the Tigris and Euphrates 900 miles from the mouths of these rivers. In 1918 the disease was first found to be endemic in parts of Palestine and in 1922 in Syria. Forty years ago the importation into Southern Rhodesia of large numbers of African labourers from the northern parts of the continent resulted in widespread infection of the planorbis snails in the local rivers, with a spread of bilharziasis among the native population. Now a fifth of the population of Southern Rhodesia is believed to be infected with bilharzia. The Schistosomiasis Research Laboratory at Salisbury has long been engaged on the problems of mass diagnosis and treatment of the disease among the populace of Southern Rhodesia. Pioneer papers from this laboratory, on intensive antimony and on 'Miracil D' therapy, have appeared in these columns.

The African Schistosomiases was prepared under the medical guidance of Dr. D. M. Blair for showing to doctors, and this no doubt accounts for the excellence of the photomicrography of the parasite and tissue histology and for the extremely well pictured and

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[1] H.M. Stationery Office. Pp. 31. 6*d.*

histidine and cysteine. Experiments on animals[13] have shown that such complexes are *relatively stable* in the body, and they may act by creating an anoxia in the bone-marrow. The response to such anoxia is known to be just what is observed after treatment with cobalt—i.e., increases in the red cells and hæmoglobin of subjects who are not anæmic. In anæmia the stimulus of anoxia already exists, so cobalt has little or no further effect.

Interest in cobalt has been further aroused by the discovery that it seems to be a constant constituent of vitamin B_{12}—one of the substances that can transform megaloblastic erythropoiesis to normoblastic. In view of the anæmia known to be caused in cattle and sheep by cobalt deficiency, it was natural to suggest that the animals were suffering from a deficiency of vitamin B_{12}, possibly because their intestinal flora could not synthesise B_{12} in the absence of cobalt. This hypothesis has been tested by BECKER, SMITH, and LOOSLI.[14] It was known that cobalt deficiency in lambs can be cured by them with as little as 1 mg. daily, but that cobalt is *injected* no detectable response o as long as seven weeks, presumably because th does not reach the rumen in sufficient quan this syndrome were really a B_{12} deficiency, of vitamin B_{12} should produce a remission. dingly, lambs with conspicuous symptoms o deficiency were injected with crystalline vit in doses of up to 125 μg.; but the sympto unaffected. Vitamin-B_{12} concentrates were to affected lambs for up to six weeks; but a results were negative.

We are left with the impression that, cobalt deficiency is of real importance in it plays no part in physiological erythropoiesis Its action on the red cells of normal or mildly persons seems to be a kind of artificial stin and the therapeutic value of such stimul syndromes that are essentially deficiency must be very limited. There are usually more means of attaining the desired result.

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[13] Orten, S. M., Bucciero, M. C. *J. biol. Chem.* 1948, 176, 961.
[14] Becker, J. E., Smith, S. E., Loosli, J. K. *Science*, 1949, 110, 71.

Annotations

THE HOUSE COMMITTEE

THE larger the group of hospitals under a single hospital management committee or board of governors, the greater is the need for each of them to have a house committee to study its particular needs. Many such house committees have been set up, their official status being that of subcommittee to the [illegible] mittee itself; but their constitution, [illegible] allotted to them, vary widely. In discussing these functions last October[1] we remarked on the risk that if too much power was delegated to the house committee the result would be administration in three tiers—regional board, management committee, and house committee—instead of the intended two. But we also urged that house committees, as "the people on the spot," must have real authority if they were to be of any use. We suggested that their primary responsibility might be defined as "to make recommendations to the hospital management committee on all matters affecting the welfare of the hospital."

While accepting the propriety of local variation, the Ministry of Health has now laid down some principles that it believes should be followed henceforth. The Minister holds that "in large or widely scattered groups the appointment of house committees can do much to stimulate and maintain a lively local interest in the hospital service, to give valuable opportunities for voluntary public work, and to provide a field for recruitment, or a training ground, for future members of management committees and boards of governors." In some areas (though the Ministry does not say so) the idea of having house committees has been attenuated almost to futility by confining their membership to a few members of the management committee itself, meeting with all the usual officers. Reminding them that subcommittees need not all be drawn from the parent committee or board, the Ministry advises that local organisations should be consulted in making a choice of people to be coöpted, and points out that retiring members of boards and committees need not be excluded.

On the vexed question of their purpose in the scheme of things, the Minister thinks it undesirable to confer executive functions on house committees—e.g., to delegate to them powers of appointing staff, or of incurring expenditure (other than from "free moneys.") Their value, the Ministry says, lies rather in over daily conduct of the hospital and the welfare of and staff, and of making recommendations to the ment committee or board of governors for tho to decide. Accordingly the powers delegated should never exceed the following:

General.—(i) Visiting, supervising the *welfare* of and staff, and making recommendations to the m committee or board on the day-to-day running of th (but not taking executive action). (ii) Reco developments or new policy to the management c or board.

Financial.—(i) Managing the individual hospit of the management committee's or board's "free (House committees cannot, however, legally accep gifts. These must be held in the name of the ma committee or board of governors). (ii) House c should not, however, be empowered to incur on authority any expenditure from Exchequer funds.

The policy thus set out by the Ministry, if in positively rather than negatively, should go far house committees with a life which some now lack. There is a very real need for lin hospitals closely with the local communities th and with care and wisdom the house commi be made into a strong link rather than a weak

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[1] *Lancet*, 1948, ii, 535.

AUDIOLOGY

"The science of hearing" is the definition the new word "audiology" which has lately be to the medical dictionaries. Hearing, and for tha lack of hearing, has been and continues to be of prime interest and importance to the otolo physiologist, the psychologist, the physicist, th tionist and the teacher of the deaf, the phonet the speech-therapist, and the worker in social All these "ists," and more, are concerned with but only too often they have tended to stu isolated groups, concentrating on one of its many and the interchange of information between thes has not always been as free as it might have b provide a meeting-ground where all the pro authorities can pool their problems and the solutions, it seemed that some new organisat needed; and so audiology was conceived.

Already in America there are a professor of a (Professor Cahart) and consultants in audiolog Veterans Administration, the chief of whom Norton Canfield. Last year, the first Inter Conference on Audiology was held in Stockholm efforts in all sorts of fields, in spite of the . of the State in social work since July 5,

ATRIAL INFARCTION

the frequency and great clinical significance tion of the left ventricle is considered, the of the other heart chambers from such lesions rkable. According to Soderström,[1] however, y be much commoner than is thought. Being ss conspicuous than those in the left ventricle, apt, he thinks, to be overlooked. He set out to te infarction of the auricles using autopsy in which there was auricular thrombosis; and ible, incidentally, to study the general ætiology romboses in these chambers. Apart from the in the left auricular appendix, found particularly matic heart-disease and probably caused by gnation of the blood-stream, auricular thrombosis erally due to an underlying lesion—either a mural ditis or a myocardial infarction. Discussing at the relation between auricular fibrillation and rombosis, he concludes that the direct connexion them has been exaggerated. Atrial infarction, is almost impossible to recognise with the naked d even its histological diagnosis proved difficult. id it very much more often in the right than in t auricle, the difference being accounted for, , by the oxygenated state of the blood on the . Clinical recognition of atrial infarction is difficult it causes few signs and symptoms; but cardio- changes may suggest its presence. The P wave abnormal in size or form, and the P-Q interval e shortened; but a more characteristic finding elevation of the P-Ta level, which Söderström as diagnostic of infarction of the posterior wall ight auricle.

APPROVED NAMES FOR DRUGS

ING the late war the General Medical Council from time to time lists of approved non- tary names for foreign drugs which were being, ut to be, manufactured in Britain. The aim was ck the multiplication of names for the same nces, and since the war the British Pharmacopœia ission has extended the practice to drugs devised as made in this country.

ssuing its latest list (see p. 354) the commission s that if any of the drugs given approved names entually described in the *B.P.* these will be their titles, though recognition of an approved name ot imply that the substance will necessarily be ed in the *B.P.* The commission will consider ts from manufacturers and others for approved for products which seem likely to come into ished use. Such a request should be accompanied armacological and clinical reports on the drug ned and several suggestions for a suitable name, ng any that are similar to existing trade marks ther current names. In coming to a decision the ission's nomenclature committee will consult the facturer's representatives, but the final choice will ith the commission. If a manufacturer then issues rug under a proprietary name, the approved name d appear on the label no less conspicuously than proprietary one. The commission sets out the ing principles for guidance in devising new names:

nes should preferably be free from any anatomical, ological, pathological, or therapeutic suggestion.

attempt should first be made to form a name by com- syllables from the scientific chemical name, so as to ite the significant groupings of the compound.

mes should, in general, not exceed four syllables. They d be distinctive in sound and spelling from those already in use. Names which are difficult to pronounce or to remember should be avoided, as should the addition of a terminal capital letter or number.

Names used in the *U.S.P.*, the *B.P.C.*, or in *New and Non-Official Remedies* should receive preferential consideration.

These terminations should be used:

-ine (Latin *-ina*) ..	for alkaloids and organic bases.
-in (Latin *-inum*) ..	for glycosides, glycerides, and neutral principles.
-ol	for alcohols and phenols (-OH group).
-al	for aldehydes.
-one	for ketones and other substances containing the CO group.
-barbitone or -itone .	for barbiturates.
-caine or -aine ..	for local anæsthetics.

Correspondence relating to approved names should be addressed to the secretary, British Pharmacopœia Commission, 44, Hallam Street, London, W.1.

VETERINARIANS AND FOOD-SUPPLY

THOUGH the peoples of many parts of the world go short of food, and the carrying capacity of the soil is being reduced, the population continues to increase, especially in the more primitive areas. As Lord Boyd-Orr pointed out in his opening address to the 14th International Veterinary Congress held in London last week, many scientific developments are tending to accelerate these tendencies. He had great faith, however, in the ability of the agricultural and engineering sciences, if properly applied, to restore many of the eroded soils, and he regarded the activities of the veterinary services as almost wholly beneficial. This is generally true, because when man prevents disease in livestock it enables him to adopt better methods of breeding and management; and he usually does not allow domestic animals to multiply beyond his needs. In a wide survey of the veterinary profession's contribution to the world's meat-supply, Mr. C. S. M. Hopkirk described how vaccines have been used successfully against cattle plague (rinderpest) by UNRRA and later by the Food and Agriculture Organisation. Work on rinderpest and all the other diseases of animals and poultry, together with the study of animal nutrition and genetics, are obviously beneficial; although, when discussing the breeding and rearing of animals, Prof. N. Lagerlof argued that hormonal treatment which permits animals with functional sterility to breed may have its harmful side. These subjects and many others relating to animal production were discussed at the sectional meetings, and the congress certainly did much to stimulate improvement in methods of disease control which will have their eventual effect on the provision of foods for human consumption. At its closing session it recommended strengthening of international veterinary organisation. so as to set up an active world-wide control capable of advising governments on the urgent steps necessary to control animal diseases.[1]

When the British Association meets at Newcastle-on-Tyne on Aug. 31 it will hear a presidential address from Sir John Russell, F.R.S., on World Population and World Food-supplies; and much is likely to be said on this basic subject in the discussions that will follow.

DR. W. G. WILLOUGHBY, formerly medical officer of health for Eastbourne and a past president of the British Medical Association, died on Aug. 13 at the age of 83.

Sir ALAN NEWTON, past president of the Royal Australasian College of Surgeons, died in Melbourne, on Aug. 4, at the age of 62.

On Aug. 11 the Red Cross conference at Geneva voted approval of the four new conventions adopted last year at Stockholm (see *Lancet*, 1949, i, 761). This vote does not, however, mean that all the 60 nations taking part in the conference will ratify all the treaties.

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ocardial Infarction and Mural Thrombosis in the Atria of he Heart. By NILS SODERSTROM. *Acta med. scand.* 1949, uppl. 217.

1. *Times*, Aug. 15, p. 2.

ibed laboratory procedures. The life history of the
site is well done ; so also are the techniques for
atory and field diagnosis of the disease from speci-
of urine, stool, and snail and by quick skin and
tests of groups of villagers. The preparation and
f cercarial antigen for diagnosis are clearly shown.
venous and oral treatment are described in detail
preventive measures fully explained. The film takes
inutes, and it would be improved for medical
nces if some of the less visible macroscopic views of
logical specimens, together with such unnecessary
s as the ward collection of stool specimens and the
iew between patient and doctor, were trimmed
. The enunciation of the commentary was not quite
These are minor imperfections in a well-prepared
well-produced film. The second film, *Still Waters*,
ended for lay audiences, runs 20 minutes, is spoken
reddie Grisewood, of B.B.C. fame, and altogether
s faster and more smoothly. It tells a story of the
very by the newly arrived doctor of bilharzia
ion on a Rhodesian farm and of the steps taken to
affected workers and to eliminate the hazards of
ed waters. This film cannot fail to be well received
to be effective health propaganda among those
nts of Southern Rhodesia who can understand it.
films are obtainable in 16 mm. and 35 mm. size on
r by purchase from the Public Relations Office,
nment of Southern Rhodesia, 429, Strand, London,
.

EVENTING RECURRENCES OF RHEUMATIC FEVER

EN a new prophylactic or remedy is discovered,
seldom be accepted and applied until trials have
made with a limited number of patients under
lly controlled conditions, so as to ascertain, for
ple, whether it is likely to produc toxic symptoms or
oke a resistant strain in the causative organism.
is middle stage—between research and general
ation—belongs contemporary work on prophylaxis
umatic fever. The use of sulphonamides for this
se has been under investigation in the United
for over ten years, and there have also been
at three different centres in this country, yielding
s that are understood to be less conclusive. The
from Australia which we publish at the front
s issue describes observations on 211 treated cases
study which began in 1944. Small doses of sul-
lamide were administered daily and continuously
roup of children immediately after acute rheumatic
es, and the recurrence-rate in this group proved
3·2% in 565 person-years, which compares favour-
with 11·8% in 971 person-years in a control group.
figures are comparable to those reported in
ca and summarised by Barclay and King-Lewis,[1]
there was a recurrence-rate of 1·2% in 500 patient-
s in treated cases, and of 19·8% in 500 controls.
fessor Rubbo and his colleagues who did this work
toxic symptoms as "minimal." They demonstrated
evelopment of a sulphanilamide-resistant strain
molytic streptococci, but this did not seem to be
ated with any alteration of virulence or infectivity,
ey therefore think that such a use of a sulphonamide
no eventual danger to the community. Large
h it is, the size of their series, and the period of
ation, are insufficient to prove conclusively that
namides should be used in the prophylaxis of
atic fever. But the harm done by this disease in
g carditis is such that work meeting even with
legree of success deserves close attention. Not
teresting should be the results of research now being
d out in England and America with penicillin as
ophylactic.

Barclay, P. E., King-Lewis, F. L. *Lancet*, 1945, ii, 751.

DANGER IN MONEY

MOST of us have only one complaint about
notes ; but in Scotland[1] they are speculating a
danger of handling them in large numbers. W
bactericidal effect of copper and silver salts is
believed to keep our change relatively safe, paper
has no self-sterilising properties, and bank-n
gather dirt and probably pathogenic bacteria
Nisbet and Skeoch have examined 36 notes of
denominations by rubbing them with swabs mo
glucose broth. From the swabs cultures were
broth and also on tellurite and blood-agar p
the 36 notes 7 were found to be contaminated
or more potential pathogens. Hæmolytic st
were isolated from 2 notes, *Staphylococcus aur*
5, and pneumococci from a £1 and a £5 note. *C*
terium diphtheriæ was not isolated, and no special
was made to recover *Mycobacterium tuberculosis*,
some previous workers have reported both org
paper money. The main source of these pat
of course, the hands ; but respiratory cont
may occur when we sneeze at our pay-packet or
note is stuffed into a pocket containing, or cont
by, a purulent handkerchief.

Nisbet and Skeoch did not estimate the nu
pathogens on each note, but presumably they
small. In banks and pay offices, where large n
notes are handled and finger-tips are often licke
may be more danger. The dust arising during the
of numerous grubby notes, or during the sorting
library books, may be considerable, and, as Nis
Skeoch point out, there should be adequate ven
where such work is done. Disinfection of ban
at regular intervals might be possible, and a
moistened with a suitable disinfectant fluid
comfort the teller. Meanwhile most workers will c
to study the physical rather than the biological
of the wad.

VOLUNTARY EFFORT

IN the wake of Lord Beveridge's *Voluntary*
published last year, comes the evidence[2]—or th
presentable portion of the evidence—on which th
was written. Such a supplementary volume is
ably a collection of scraps, which makes it rather
reading ; but this one was well worth publishing, if
a directory, though its account of some 400–500 vo
societies (all established in a big way) is eclipsed
handbook lately republished by the National
of Social Service. Just as, in *Voluntary Action*
Beveridge was primarily concerned with friendly s
so, in editing the *Evidence*, he gives pride of p
Mass-Observation reports on what large num
ordinary citizens thought about the practice of
aid, and about paying their weekly pennies or s
into a friendly or a collecting society for th
of extra sick benefits and death benefits. One
achieved by these painstaking interviews of
samples is to show that nearly half the people
really understand fully what they were talking
Some were indifferent about whether they paid
into a genuine voluntary friendly society or
collecting business like the Prudential. Others
know the meaning of the term "Friendly Soc
one woman in a northern town thought it was so
of company for selling cigarettes. Doubtless these
all expressed their real opinions to the canvasse
the question remains whether such opinions reflect t
merits and demerits of voluntary or commercial inst

In a last chapter of memoranda by individu
special topics, Mr. Roger Wilson, of University C
Hull, pleads cogently for the continuance of vol

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1. Nisbet, B. R., Skeoch, T. *Med. Offr*, 1949, 81, 225.
2. The Evidence for Voluntary Action. Edited by Lord Be
and A. F. WELLS. London : Allen & Unwin. Pp. 340

an "unfit for work" form or milk-priority ate. Nevertheless, the danger of such influence ification may be equally great on the other side; e State, with its greater powers, can bring more pressure to bear upon a doctor on more important than a private patient can. To take a firm line patient may mean losing that patient. To take a ne with the State may mean losing one's job, or unless the doctor has either a strong assurance of egrity of the State or has his freedom of judgment dequately safeguarded.

tors should make it clear, to themselves and each to the State and local authorities, and to their patients, that they are obliged by their ethical o give an objective professional judgment on s of certification, no matter who is paying them, hat their opinion cannot be altered to suit the yer. This does not, of course, exclude an obligation doctor's part to take a "humane" view, because lso part of the doctor's ethical code to be humane. a hospital board of governors, or a local authority, egional board employs its doctors to treat their ts impartially as fellow-citizens, as "whole men," is well to remember that it is they, and not the ls of the organisations concerned, who are the r's ultimate paymasters and employers. If no e patient has the right to expect indulgences in t of certificates not supported by medical facts, partment of State or local authority has the right nand harshness from the doctor or to permit medical to be ignored. In either situation, the doctor has luty to insist on maintaining the integrity of his ssional opinion.

e other dangerous potentiality is that public policy ertain disputed matters, such as the use of birth ol or of abortion, may clash with the conscientious s of individual doctors. The matter has already n in connexion with certain public-health appoint- s; but the Ministry of Health has always shown a ct for the scruples of the medical officers and nurses erned, and has issued instructions, for example, no persons shall be compelled to give birth-control e as a routine duty. In the Parliamentary debates he National Health Service Act these assurances repeatedly renewed.

RESPONSIBILITIES

is clear, however, that with the "State" in one or another as his main, and perhaps in time as his , employer, the Christian doctor must have a par- arly vigilant eye on his rights and responsibilities elation to it and to his patients. An easy-going iescence in the conditions under which he has to k will henceforward be impossible for him; otherwise nay find that, either through malice or ignorance, ill be made impossible for him to do his proper work. ainly he must not give in to the defeatist notion, h ardent partisans endeavour to foster and which ontradicted by the practice of the large number of tors already engaged in public service, that when he omes the servant of a public body he will no longer d, and in any case will not be able to maintain, high idards of professional behaviour. To say that is ually the same as saying that under the conditions modern technical society he finds it impossible to rcise a Christian vocation at all, because it is as much pressure of the kind of society in which we are all as any overt action by the State which is forcing upon medical profession this much more centralised anisation of its activities. Diligence, courtesy, com- sion, and disinterestedness are certainly not needed in a Government or local-authority officer than they in a general practitioner. In fact they are more needed, ensure that the patient himself is not lost in a mass of red tape, and they will be the more appreciated because they will be known to be freely and spontaneously given. Any organisation is very much what those who run it make it, and doctors, whether they agree with a State medical service in principle or not, should do their best to work it with the utmost determination to make the best of it. If they take a strong and adventurous line it is fairly safe to assume that they will be able to do far more with it than they ever realised. After all, even on the most realistic level, they are not without powerful weapons in their hands to resist attempts to coerce them into doing things which violate their professional code. A courageous readiness to maintain their professional integrity—which always involves courage in a fallen world, whether among doctors or any other section of the community—together with a firm recognition of their conscientious duty to their employers, will do more to establish the best interests of the profession under the new relationship than any unseemly squabbles about fees and petty rights.

This is not to say that under a new régime there will not be a greater need than ever for doctors to have strong professional associations, to guard their liberties and to sustain individual protests. But these associations themselves, if they are to continue to speak with authority and to command the sympathetic attention of the public, must have a wide and imaginative conception of the doctor's vocation. Above all, there should be a clear-eyed recognition on the doctor's part of the vital importance of informed and responsible political institutions. Any body which submits itself to a measure of State control in these days is giving hostages to fortune. Everything ultimately depends on the sort of master the State is likely to be. In modern England it is reasonably possible to hope that the State is likely to behave fairly responsibly towards those who have to serve in a medical service. It is the agent not the master of its people, and the existing State services maintain high standards of professional integrity. At the same time, it is clearly essential, not merely that the "public relations" of the medical profession should be good, or that institutions like the "Radio Doctor" should exist, but that the doctor should have a clearly defined code of public duty and a critical approach to what is happening in society around him as it affects his own position. The whole question of what the position of the doctor in society is becomes an urgently practical one.

STANDING OF THE PROFESSION

Because this is so, it is worth realising the extent to which the high esteem, both social and professional, which doctors enjoy, is one of the distinctive products of modern times and not something which has always been inherent in the nature of things. There were small coteries of doctors of medicine and some outstanding surgeons gathered around the universities and the Court from the Middle Ages onward, but it was not until the 19th century that fully qualified doctors became easily available to the great majority of the population and that the social and financial status of the profession began to rise. In the old days, the medical man whom most ordinary people had contact with was the apothecary or the barber surgeon. The apothecary was a relatively humble person in society, exercising a useful and humdrum function. He was not in a position to assert great authority; nor had he the equipment to make striking advances in medical knowledge. His skill was very largely his own, his native shrewdness and deftness of hand being increased by experience rather than training, and his knowledge was acquired not primarily from learned books and technical journals but from his own developments and improvements by practice of a few simple and well-tried rules and remedies. His social status was certainly not among the gentry and was

Points of View

THE DOCTOR'S PROFESSION*

3. The Doctor, the State, and Society

WHAT is the general condition of the medical profession as it appears to the Christian man who is inquiring about his duty in relation to it? There is no doubt that in many of its aspects it reaches a high level of excellence and is regarded as doing so by Christian public opinion in general. It is common in these days to hear indignant moralists assert that they cannot understand how a man can be a good business man or a soldier and at the same time a Christian, but it is rarely that anyone says that it is impossible to be a doctor and to be a good Christian. Not only is the purpose which the medical profession is dedicated to serve, clearly an admirable one, but, on the whole, it is generally agreed that doctors achieve at least as high a degree of proficiency in their calling as any other professional group. Occasional criticisms are to be heard of the profession, whether from the lips of Mr. G. B. Shaw or from disgruntled frequenters of outpatient departments; but, where the criticism is responsible, it arises partly as a result of the high standards which the public has been taught by the profession itself to expect of the doctor.

These high standards are so frequently taken for granted that it is often not realised how extensive they are and what a considerable ethical achievement they represent in the world as we know it. Although he is no longer normally required to take the Hippocratic Oath, the doctor is bound to respect human life in all its forms; to preserve his patient's health, his secrets, and the honour of his family to the utmost of his power; to make discoveries revealed by his professional skill open to all; and to refrain from advertisement of his professional merits. There are other long-established obligations of the doctor that he still accepts which are less clearly defined but none the less binding, such as to relieve suffering to the utmost of his power at all times, to give at least a proportion of his services in charity and without reward, and to show complete and disinterested honesty in giving a professional opinion. It is significant of the strength of the doctor's code in an increasingly materialistic world that the discoverers of penicillin expected and received rewards for their labours which were very slight indeed compared with what they might have received if they had put their discovery to commercial uses. Apart from security restrictions during the war, no restraint was put upon the dissemination of information about the drug except what was necessary to prevent commercial interests from producing inferior imitations, and it was made available to the tramp as well as to the millionaire. What is more, the world would have been genuinely shocked if it had happened otherwise.

On the other hand, there are other aspects of the state of medicine today which prevent complacency. We have already noted the challenges which are being made today with great force to many of the most cherished traditions of the medical profession. Further, high though the profession's standards and achievements are, there are grave limitations of outlook and even professional competence imposed upon the doctor by the character of medical education. The distribution of doctors throughout the population in this country is still very uneven, and this is more spectacularly true in those less favoured parts of the world where we in this
country have special responsibilities, such as t
Despite the great efforts of hospitals and th
ficing devotion of individual doctors, the
money a patient has often makes some differ
quality of medical attention he receives and
to the conditions under which it is given.

The great changes now taking place in t
profession may do much to remove its abuse
also raise new problems of peculiar complexit
therefore we can usefully consider what
looking out for in a situation in which the
play a much larger part in the life and work o
than ever before.

INTENTIONS AND RISKS

The first point to emphasise is that the
whatever his views on the particular form of
service and however adversely it may affe
position, should do justice to the positive
inspires the State in setting it up—that o
more efficient and comprehensive care for
majority of people than they have previously
discussion of this question must start from th
tion. The idea is to provide a more just a
service.

Secondly, so far from recognising the State
to be avoided, many doctors welcome the op
serving the State as a means of relieving,
some of the pressures of financial ambition a
them an unambiguous duty to serve, not th
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an "unfit for work" form or milk-priority te. Nevertheless, the danger of such influence ification may be equally great on the other side; e State, with its greater powers, can bring more pressure to bear upon a doctor on more important han a private patient can. To take a firm line patient may mean losing that patient. To take a ne with the State may mean losing one's job, or unless the doctor has either a strong assurance of egrity of the State or has his freedom of judgment dequately safeguarded.

ors should make it clear, to themselves and each to the State and local authorities, and to their patients, that they are obliged by their ethical o give an objective professional judgment on s of certification, no matter who is paying them, nat their opinion cannot be altered to suit the yer. This does not, of course, exclude an obligation doctor's part to take a "humane" view, because so part of the doctor's ethical code to be humane. a hospital board of governors, or a local authority, egional board employs its doctors to treat their ts impartially as fellow-citizens, as "whole men," is well to remember that it is they, and not the ls of the organisations concerned, who are the 's ultimate paymasters and employers. If no e patient has the right to expect indulgences in t of certificates not supported by medical facts, partment of State or local authority has the right nand harshness from the doctor or to permit medical to be ignored. In either situation, the doctor has uty to insist on maintaining the integrity of his ssional opinion.

e other dangerous potentiality is that public policy ertain disputed matters, such as the use of birth ol or of abortion, may clash with the conscientious s of individual doctors. The matter has already n in connexion with certain public-health appoint- s; but the Ministry of Health has always shown a ct for the scruples of the medical officers and nurses rned, and has issued instructions, for example, no persons shall be compelled to give birth-control e as a routine duty. In the Parliamentary debates he National Health Service Act these assurances repeatedly renewed.

RESPONSIBILITIES

is clear, however, that with the "State" in one or another as his main, and perhaps in time as his , employer, the Christian doctor must have a par- arly vigilant eye on his rights and responsibilities elation to it and to his patients. An easy-going iescence in the conditions under which he has to will henceforward be impossible for him; otherwise nay find that, either through malice or ignorance, ill be made impossible for him to do his proper work. ainly he must not give in to the defeatist notion, h ardent partisans endeavour to foster and which ontradicted by the practice of the large number of tors already engaged in public service, that when he omes the servant of a public body he will no longer d, and in any case will not be able to maintain, high ndards of professional behaviour. To say that is ually the same as saying that under the conditions modern technical society he finds it impossible to rcise a Christian vocation at all, because it is as much pressure of the kind of society in which we are all as any overt action by the State which is forcing upon medical profession this much more centralised anisation of its activities. Diligence, courtesy, com- sion, and disinterestedness are certainly not needed in a Government or local-authority officer than they in a general practitioner. In fact they are more needed, ensure that the patient himself is not lost in a mass of red tape, and they will be the more appreciated because they will be known to be freely and spontaneously given. Any organisation is very much what those who run it make it, and doctors, whether they agree with a State medical service in principle or not, should do their best to work it with the utmost determination to make the best of it. If they take a strong and adventurous line it is fairly safe to assume that they will be able to do far more with it than they ever realised. After all, even on the most realistic level, they are not without powerful weapons in their hands to resist attempts to coerce them into doing things which violate their professional code. A courageous readiness to maintain their professional integrity—which always involves courage in a fallen world, whether among doctors or any other section of the community—together with a firm recognition of their conscientious duty to their employers, will do more to establish the best interests of the profession under the new relationship than any unseemly squabbles about fees and petty rights.

This is not to say that under a new régime there will not be a greater need than ever for doctors to have strong professional associations, to guard their liberties and to sustain individual protests. But these associations themselves, if they are to continue to speak with authority and to command the sympathetic attention of the public, must have a wide and imaginative conception of the doctor's vocation. Above all, there should be a clear-eyed recognition on the doctor's part of the vital importance of informed and responsible political institutions. Any body which submits itself to a measure of State control in these days is giving hostages to fortune. Everything ultimately depends on the sort of master the State is likely to be. In modern England it is reasonably possible to hope that the State is likely to behave fairly responsibly towards those who have to serve in a medical service. It is the agent not the master of its people, and the existing State services maintain high standards of professional integrity. At the same time, it is clearly essential, not merely that the "public relations" of the medical profession should be good, or that institutions like the "Radio Doctor" should exist, but that the doctor should have a clearly defined code of public duty and a critical approach to what is happening in society around him as it affects his own position. The whole question of what the position of the doctor in society is becomes an urgently practical one.

STANDING OF THE PROFESSION

Because this is so, it is worth realising the extent to which the high esteem, both social and professional, which doctors enjoy, is one of the distinctive products of modern times and not something which has always been inherent in the nature of things. There were small coteries of doctors of medicine and some outstanding surgeons gathered around the universities and the Court from the Middle Ages onward, but it was not until the 19th century that fully qualified doctors became easily available to the great majority of the population and that the social and financial status of the profession began to rise. In the old days, the medical man whom most ordinary people had contact with was the apothecary or the barber surgeon. The apothecary was a relatively humble person in society, exercising a useful and humdrum function. He was not in a position to assert great authority; nor had he the equipment to make striking advances in medical knowledge. His skill was very largely his own, his native shrewdness and deftness of hand being increased by experience rather than training, and his knowledge was acquired not primarily from learned books and technical journals but from his own developments and improvements by practice of a few simple and well-tried rules and remedies. His social status was certainly not among the gentry and was

Points of View

THE DOCTOR'S PROFESSION*

3. The Doctor, the State, and Society

WHAT is the general condition of the medical profession as it appears to the Christian man who is inquiring about his duty in relation to it? There is no doubt that in many of its aspects it reaches a high level of excellence and is regarded as doing so by Christian public opinion in general. It is common in these days to hear indignant moralists assert that they cannot understand how a man can be a good business man or a soldier and at the same time a Christian, but it is rarely that anyone says that it is impossible to be a doctor and to be a good Christian. Not only is the purpose which the medical profession is dedicated to serve, clearly an admirable one, but, on the whole, it is generally agreed that doctors achieve at least as high a degree of proficiency in their calling as any other professional group. Occasional criticisms are to be heard of the profession, whether from the lips of Mr. G. B. Shaw or from disgruntled frequenters of outpatient departments; but, where the criticism is responsible, it arises partly as a result of the high standards which the public has been taught by the profession itself to expect of the doctor.

These high standards are so frequently taken for granted that it is often not realised how extensive they are and what a considerable ethical achievement they represent in the world as we know it. Although he is no longer normally required to take the Hippocratic Oath, the doctor is bound to respect human life in all its forms; to preserve his patient's health, his secrets, and the honour of his family to the utmost of his power; to make discoveries revealed by his professional skill open to all; and to refrain from advertisement of his professional merits. There are other long-established obligations of the doctor that he still accepts which are less clearly defined but none the less binding, such as to relieve suffering to the utmost of his power at all times, to give at least a proportion of his services in charity and without reward, and to show complete and disinterested honesty in giving a professional opinion. It is significant of the strength of the doctor's code in an increasingly materialistic world that the discoverers of penicillin expected and received rewards for their labours which were very slight indeed compared with what they might have received if they had put their discovery to commercial uses. Apart from security restrictions during the war, no restraint was put upon the dissemination of information about the drug except what was necessary to prevent commercial interests from producing inferior imitations, and it was made available to the tramp as well as to the millionaire. What is more, the world would have been genuinely shocked if it had happened otherwise.

On the other hand, there are other aspects of the state of medicine today which prevent complacency. We have already noted the challenges which are being made today with great force to many of the most cherished traditions of the medical profession. Further, high though the profession's standards and achievements are, there are grave limitations of outlook and even professional competence imposed upon the doctor by the character of medical education. The distribution of doctors throughout the population in this country is still very uneven, and this is more spectacularly true in those less favoured parts of the world where we in this country have special responsibilities, such as th
Despite the great efforts of hospitals and th
ficing devotion of individual doctors, the
money a patient has often makes some diffe
quality of medical attention he receives and
to the conditions under which it is given.

The great changes now taking place in t
profession may do much to remove its abuse
also raise new problems of peculiar complexit
therefore we can usefully consider what
looking out for in a situation in which the
play a much larger part in the life and work o
than ever before.

INTENTIONS AND RISKS

The first point to emphasise is that the
whatever his views on the particular form of
service and however adversely it may affe
position, should do justice to the positive
inspires the State in setting it up—that o
more efficient and comprehensive care for
majority of people than they have previously
discussion of this question must start from th
tion. The idea is to provide a more just a
service.

Secondly, so far from recognising the State
to be avoided, many doctors welcome the opp
serving the State as a means of relieving,
some of the pressures of financial ambition an
them an unambiguous duty to serve, not the
a privileged group, but the whole community

At the same time, it is clear that the incu
State on a large scale into this realm involves
example, in a time of confusion of standar
present, it is essential that some freedom in
and personal a matter as the choice of docto
given to as large a number of people as pos
unless all parties concerned are persistently
is easy to see how this freedom may graduall
in practice. Again there is something to be s
view that the doctor's freedom from clinical i
in public services in the past has depend
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body of medical men to which they are able
Take away that body and the position m
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* Four essays arising from discussions held under the auspices of The Christian Frontier Council (8, The Cloisters, Windsor Castle). [illegible] permission to print them we are indebted to the Student [illegible]s Ltd. (58, Bloomsbury Street, W[illegible]lishing them in full, with others, [illegible] Profession. This book is likely to appear in October, and the probable price is 4s. 6d.

-the whole social context in which we live our may yet turn out to be a great boon.

t this point, perhaps, that something can most ɔe said about the modern development of health in which some Christian people have shown a ·ıl of interest. The exponents of these ideas, and those at Peckham, are criticised sharply for a pretentiousness in their claims and for the ɜ scientific jargon in which they present familiar f ordinary observation with an air of great dis- At the same time, their work has served to ɜe the need for taking the laws necessary for health into account at the basic level of social ;. It should be remembered also that it is in ure of a sound sociological generalisation that is made it appears obvious because it enables us ı a slightly different light certain familiar facts, re can be no doubt that the work of such pioneers e working at Peckham † and Coventry have s see in a new way the importance of the family, , and the pattern of social living in relation to l health. Provided these activities are seen in portion and do not become a new fad, they offer resting and rewarding extension of the idea of l practice, which may have a considerably enrich- ct upon the work of the profession in the future. ver may be said of the particular health-centre s which have been so far attempted, the attempt a new integration between physical, mental, and ıl health, which is impossible unless it is a social as an individual enterprise, is part of the Christian s concern, and it is likely to find a ready response community today. It would be a pity if a too ly technical conception of his vocation prevented ctor from giving due attention to these matters.

DOCTOR-CONFESSOR ?

other way in which the doctor's position in society his task today is the result of the operation of ifferent forces from those just mentioned. However the importance of indirect means of combating e may be, the day-to-day dealings of the doctor he patient remain, and certain aspects of life today give it a new significance. The doctor, as we have has great prestige in modern society, and he is led as the possessor of a mysterious and powerful g knowledge. If he possesses a sympathetic ıality and a ready willingness to listen to his ıt's accounts of his difficulties and distresses—a gness which is deliberately cultivated as part of technique by some doctors in ordinary practice as as by psychiatrists—then he is frequently in a on of embarrassing authority in relation to many patients. The situation is aggravated by the moral spiritual confusion of the present day. There are eople in modern society to whom ordinary men and n are able and willing to open up their deepest rns. The priest or minister used to perform this ion, either through the impersonal medium of the ssional or in that close intimacy of parson and e which was common when people lived most of lives in one place and where most of their leisure was spent in activities gathered round the church. now only a minority of people care much for the ions that priests and ministers exercise, and they r lack or do not seek the opportunity to avail them- s of their services. The power to give absolution sin, and direction for the spiritual life, is lightly ded by those who do not feel the need for forgiveness y to live the spiritual life. What such people do seek, however, is happiness here and now, and they are firmly convinced that good health is one of the roads to such happiness. Two considerations lead such people to the doctor and prompt them to seek from him more than strictly professional attention. A lingering sense that certain actions they wish to perform need to be justified, if not to God at least to themselves or to each other, leads people to the consulting-room to find a moral sanction. "Tell me doctor, is not my life with my wife ruining my health ?" "Can my nerves ever be right while my mother-in-law lives with us ?" "Can I possibly bear the financial and mental strain of another baby ?" Most doctors are only too familiar with such questions. The other consideration is that many people who fail to find happiness on their own resources come to the doctor looking for help and guidance which cannot be found on the medical level alone, but which they are prepared to accept from a doctor and not from a priest or a moralist, because the doctor has the reputation of being a realist, upon whose practical judgment they can rely.

What is the doctor to do in this situation ? It clearly raises great difficulties for him. He often finds himself willy-nilly dragged into complicated aspects of the personal lives of his patients, so that he is, for example, the only outside person who knows of some tragedy in the life of a family or of some impending rupture in its relationships, and finds himself compelled to exercise a pastoral office for which he is untrained and for the responsible exercise of which he certainly has not the time. It is no wonder that, in sheer self-defence and not on the basis of any preconceived theory, many doctors take the view described in our essay on The Doctor as Technician, and give the patients what they want, firmly ignoring any moral or spiritual implications in the situation with which they are confronted. Yet this is clearly an irresponsible attitude on the doctor's part. He may reasonably take the view with many patients that it is not his job to be a father-confessor, and that, in any case, he cannot take away from others the burden of the moral decisions they should properly bear. At the same time, he should not shrink from these opportunities of giving guidance and help to his fellows, with which the peculiar situation of his profession in these days presents him.

There have been cases in recent times of Communists who have gone into medicine because of the opportunities of influencing people in the interests of their ideology which medicine provides. Christianity is not an ideology in that sense, although Christians only too often use it as such. But the Christian doctor should use whatever opportunities come his way to help the wayward, confused, and lonely people of this age to a better understanding of themselves, and, where he can, to find the way to the place where they can recover full and responsible manhood once more. The burden of such demands is a heavy one: but we are members one of another, and when people make demands upon us, however inconvenient it may be, we cannot easily contract out of them.

"... There are eight possible occasions a day when people eat; early morning tea, breakfast, second breakfast, elevenses, lunch, afternoon tea, evening meal (whether in the form of high tea, dinner, or supper), bed-time snack. Of course, no-one gets through the whole eight of them, but this is the general pattern:

Wednesday	*Sunday*	
4%	4%	have early morning tea
93%	98%	have breakfast
3%	1%	have a second breakfast
23%	8%	have elevenses
99%	98%	have lunch
41%	42%	have afternoon tea
96%	96%	have a high tea, supper, or dinner
61%	46%	have a late evening snack."

Mass-Observation Bulletin, January, 1949, no. 24.

Peckham Health Centre is, of course, a research institution which tries to ascertain the criteria of health, and has only a light resemblance to the Health Centres proposed under the National Health Service, whose main function is curative.

lower than that of the clergy. The barber surgeon came a great deal lower down, for with him strong muscles and a non-squeamish stomach were the primary qualifications for opening an abscess or sawing a bone.

The modern medical profession has a very different *standing in society.* Even the humblest modern medical practitioner is recognised as belonging to a mysterious and impressive closed corporation, which has vested in it one of the most cherished forms of power in modern society—the power of knowledge, and knowledge of a kind eagerly sought after by all. Miracles were not expected from the apothecary. Popular imagination turned rather to the saint or to the witch or spellbinder for spectacular cures. Now, however, these expectations are largely transferred to the medical profession, and in many cases they appear to be fully justified. The popular press is constantly announcing the discovery of some new drug or the performance of some remarkable feat of surgery, and the atmosphere engendered, both by the press and by the numerous commercial organisations which carry out medical research, encourages the belief that sooner or later medical research will find the right cure for every disease that flesh is heir to.

It is true that, despite all this, an amazing amount of quackery still exists, together with distrust of the profession in some surprising quarters. One doctor remarks that he takes it for granted that his wealthier *patients are linked up with some form or another of* quackery. Lord Rutherford, the great physicist, regarded a butcher as his doctor and died of strangulated hernia. And whatever may be the ultimate reasons for the considerable popularity of Christian Science, particularly among a class which has had wide experience of dealings with doctors, one of the reasons must, at least, be a distrust of if not disillusionment with the medical profession. Nevertheless it remains broadly true that the medical profession as a whole, whatever people may think of particular doctors, is held in high esteem in modern society because it holds the key to what many people regard as among the most desirable possessions of life—freedom from pain and disease and the power to put off the pangs of death. Adverse comment may occasionally be heard about the fortunes earned by quacks out of credulous individuals, but doctors are able to earn a far better living than teachers or parsons without calling down upon their heads a quarter of the public criticism occasioned by a rise in the Burnham Scale or by the size of episcopal incomes. Of all types of modern scientific knowledge, that of the doctor is held in the highest esteem.

BRIGHTER SIDE OF SCIENCE

The reasons for this great advance in the position of the doctor are several. Medical knowledge is one large part of the great corpus of scientific knowledge which has developed so spectacularly in the last couple of centuries. It is a part which is more obviously and *directly related to our personal lives than any other.* The doctor is the best known in the widest circles of all professional men. The quality of his training has, on the whole, developed with the development of his knowledge. And, not least in importance, medical knowledge is one of the few parts of modern scientific knowledge which is almost entirely beneficial in effect. The aeroplane and the atom bomb are obviously highly *ambiguous human achievements, but few people* have serious doubts about the value of anæsthesia or penicillin.

This last point deserves a little further reflection. Would science itself stand as high in popular estimation as it does today if it were not possible to set the discovery of healing drugs over against that of poison gas, or the surgeon's scalpel against the devilish technical ingenuity of heavy armaments? Yet, there is a sense in which all
modern scientific knowledge is a unity. What
enables the doctor, in sharp contrast with o
tists, to appear as the kindly benefactor of
It is not anything necessarily inherent in the
method alone, which, as we are so constantly
may be used for good or ill. It is the fact
knowledge is in the hands of a profession whi
clearly defined standards of conduct from a g
tion which was already well established before
impact of modern scientific development. The
the medical profession in the last couple of
until quite recently, has been the extension
standards to the whole practice of medicine
the extension of scientific knowledge. Witho
knows whether the development of the profess
have been beneficent, or what tyranny and ex
the medical profession might have indulged
kind of unscrupulous use made of public gull
fear by certain kinds of purveyors of patent
or the behaviour of illegal abortionists and
reputable psycho-analysts, are only slight indi
the road the profession might have taken.
considerations of the greatest importance t
mind when medical education is being consi

OPPORTUNITIES OF INFLUENCE

The doctor, then, enjoys considerable auth
prestige in society today. This inevitably carr
new opportunities and responsibilities, which
very well avoid accepting. Two in particular a
of mention.

First, his public prestige and the public reco
his expert competence enables him to exercise
able influence over the life and health of hi
and potential patients without their being av
All the activities which today are referred to
health, including the improvement of water-su
inspection of conditions under which food is
enforcing of standards of housing and sanita
all those other activities which make that pre
by the medical officer of health one of the busie
government departments, have possibly done
to raise the general standard of health as the d
of physicians and surgeons upon the pati
consult them. The doctor also has many d
indirect allies in working for the health of his
whether they be members of the ever-growing
almoners, health visitors, and psychiatric socia
or else teachers, broadcasters, advertisers, and
of clubs and keep-fit classes. The idea was
never more widely held or more powerfully
than today that health is a good thing and
everybody's business, and not the doctor's
observe a few simple basic rules. Quite imperso
are working on the doctor's side in this, wl
than outweigh the influence of the diseases of ci
such as constipation and mental troubles. Fo
it can hardly be *a coincidence that rapid impr*
in the feeding and care of infants, extending to
of society, have come at the same time as a f
birth-rate. Quite apart from the more adequate
made by the State for the physical needs of
their scarcity has made most people both mo
and more able to care for them aright.

All this needs to be borne in mind when
to sentimentalise *over the decay of the doct*
relationship as it used to be in some sections of
the more leisured and less complicated days of
and to deplore what is called the increasing de
ising tendency of modern society. Health
depend on the doctor-patient relationship alone
raising of standards in most matters is achie
successfully by indirect means. Most of us
being "done good to," and the impersonal at

CHIEF FINANCIAL OFFICER

modern hospital with its rapidly growing and ated business problems needs the services of an experienced in finance and accounting, including accounts, cost accounts, business methods, and of internal financial control. The accounting ons made under the Act provide for such an n the person of the chief financial officer. He is arly the servant of the finance committee, m he should report direct. This is provided for egulations. At the same time he will realise that rices must necessarily be at the disposal of all tees and executive officers of the hospital as n requires them. It is to him that the hospital ties should look for information and guidance financial matters, and he is, or should be, the by which they carry out in detail their financial and system of control.

n this, it will be obvious that the appointment is ortant and responsible one. Not only must the be well versed in sound business principles, but st understand how to institute and maintain an t accounting system based on up-to-date methods; institute a system of internal financial control, ly as affecting cash and its equivalent in services aterials, but as affecting each and every transaction will ultimately result in the receipt or payment ; and how to prepare and operate a budget which t as an instrument of administrative control over finances of the hospital. He must understand ments and the investment of funds, and how to e intelligent periodical financial and statistical ents showing clearly and fully the financial position hospital. He is responsible for the keeping of all of account and financial and statistical records, amination of accounts, their presentation to the e committee, and payment of salaries and wages, and, t to the direction of the committee, he has sole of all finances of the hospital. He is not a book- —not a mere recording agent: he is a responsible and he should be clothed with the requisite ity.

chief financial officer should exercise his control distinct places in the system—in the spending ments, and in his own department. The heads spending departments should be made responsible n for carrying out duties related to the accounting s, such as the time-recording of all employees, ing stores received and issued, examination of es and accounts as to receipt of goods, and nation of goods for quantity and satisfactory r. Control, therefore, begins with the certification e records, and it is continued when the records reach uief financial officer for entry in the financial and sts accounts, and with the preparation and presenta- of specified periodical statements to the finance ittee. Thus the term "financial control" really unity of control as exercised by the chief ial officer under the direction of the finance ittee.

various executive officers are principally concerned the invention, enactment, and execution of their al, public, and social services, and the chief financial watches these services coldly and critically from oint of view of cost. He is a watch-dog, not a -hound; his financial organisation is not intended a drag on the wheel of progress, but to see that the al gets value for its money; that there is no ragance or avoidable waste; that the most mical methods are used: and generally, by sm and financial vigilance, to serve the same se as the profit and loss account in a commercial rn.

Disabilities

37. ANXIETY NEUROSIS—II

I HAVE a bad heredity, which includes alcoholism. Strong emotional disturbances and theatrically violent family rows in my childhood made, I am told, classic provision for later instability. But I was a useful citizen doing responsible work, physically and mentally on top of things, when, at the age of 30, I was knocked down by a car in the blackout. Without this accident I think I might have remained stable.

I had a head injury and I spent five weeks in hospital. London was not, perhaps, a good place at the time for a quiet convalescence. I went on overworking, as everyone did then, and felt more and more exhausted. I had nausea, giddiness, faintness, and tachycardia. Examination showed that the symptoms were functional. I went to a psychologist who prescribed rest and relaxation. I rested, failed to achieve relaxation, felt worse, and went back to work. A year later I was bombed out, and soon after that became unfit to go on with my job, though I was still getting the work done well and few people knew I was as ill as I was.

I could barely get myself to the office or stay in it until it was time to go. I was always exhausted, always cold; my hands were clammy with sweat; I cried weakly and easily. I was afraid to go to sleep; but I did sleep, to wake with a constricting headache, dizziness, and tachycardia. To these now familiar symptoms were added waves of panic fear followed by depression. The panics almost overwhelmed me. I felt very much more frightened when I was alone and but a little less frightened with other people. There were only three with whom I felt at all safe and able to relax, though even with them I was behind the screen of my fears. At the height of a panic I just wanted to run—anywhere. I usually made towards one of these reliable friends (two of them were doctors), from wherever I happened to be. I felt, however, that I must resist this running away, so I did not allow myself to reach safety unless I was in extremity. One of my devices to keep a hold on myself at this time was to avoid using my last chance, for I did not dare to think what would happen if it failed me. So I would merely go nearer to my bolt-hole and imagine the friendly welcome I should get. This would often quieten the panic enough for me to start out again, or at least not be a nuisance or use up any good will. Sometimes I was beaten and had to feel the acute shame and despair of asking for company. I felt the shame even when I hadn't to confess to my need.

One of the most distressing symptoms of this period, which was—and occasionally still is—associated with the panics, is a sensation of divided personality. There is Me 1 and there is Me 2, though neither of them is really me, for "I" am detached and merely the battleground for the two of them. Me 1 seems to be my intellect, with a good bedside manner, reassuring and commonsensical. Me 1 chivvies the wretched Me 2 along. Me 2 is the sickly panic-stricken me, who can reduce Me 1 to catch phrases, rote repetitions, and cursing. So far, Me 1 has remained on top even in the worst panics, and is helped by occupation. I have never fallen down on a job, and when I discovered that, as long as I felt reasonably safe, work helped, I kept my brain busy. I could not happily read modern psychological novels or books with much genuine emotional content. It was a bad day when I started Arthur Koestler's "Arrival and Departure" (I did not finish it); and "Crime and Punishment" was a mistake at the time too. History was good, learning some German was better. Tenses and declensions were magnificent repetitive stuff to cling to during panics, and to return to after the climax when

Reconstruction

RESPONSIBILITIES OF FINANCE COMMITTEES AND THEIR OFFICERS *

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REGULATIONS under the National Health Service Act require each board [illegible] to appoint a finance [illegible] ment committee a finance subcommittee. Though no direct provision is made for his appointment, the regulations state that "chief financial officer" means the treasurer or other officer charged with the duty of keeping the accounts of these bodies. The accounts he is required to keep are: (1) a balancing system of double-entry ledger accounts recording all the transactions of the board or committee on an income and expenditure basis; and (2) proper records relating to store accounts and stocktaking returns. He is also responsible to the board or committee for the proper collection of all moneys due and the proper payment of all debts, for the maintenance and completion of all financial records and returns required by the board or committee, or by the Minister, and for the submission of accounts to the auditor. He is not required by the regulations to hold a recognised accountancy or other professional qualification.

Finance lies at the root of all hospital administration, as indeed of most of our problems today, and the policy of every finance committee must be guided by the financial estimates approved by the board or committee. Acting for its board or committee, the finance committee is in effect a trustee for the funds entrusted to it, and acting in that capacity it has two important duties to perform: (1) to account strictly for all moneys entrusted to its charge; and (2) to secure that in the spending of such moneys the greatest economy consistent with efficiency is exercised.

DUTIES OF A FINANCE COMMITTEE

Such a committee is at once opposed to the erroneous but popular view that "the finance committee is only the committee which passes the bills." Rather is it the duty of the finance committee to consider and approve the estimates of expenditure; to inquire into and report upon both over-spendings and under-spendings (the latter are almost as important as the former); to exercise a continuous control over current expenditure; to consider periodical statements of expenditure and other financial returns; to examine from the financial point of view all proposals involving expenditure, whether of a revenue or capital nature; to supervise the methods of internal financial control; to examine all financial clauses in contracts; to consider the financial basis of all arrangements with other authorities for the treatment of patients; to supervise endowments under their control; and to review salaries and wages and submit recommendations thereon, and on matters of financial policy generally. The greater the efficiency of the control which can be exercised by this committee, the more effective will be the whole financial administration of the board or committee.

The key by which to test the efficiency, or laxity, of the administrative policy of a board or committee is generally to be found in standing orders. (These should be printed in booklet form and issued to members of boards, committees, and responsible officers, for they lose much
of their effectiveness when they are contained
of places—scattered in minute-books or
miscellaneous papers.) For the purposes of t
let us consider what these orders should
respect of finance committees. All the
in the list given below will not apply to a
committees, but it is comprehensive enough
the selection of items appropriate to any comm

SUGGESTED ORDERS

1. That the whole of the account-keeping of t
shall be centralised under the control of the chi
officer, who shall be directly responsible to t
committee.

2. That the chief financial officer shall institut
of internal audit and that he shall report to
committee from time to time as to whether the
being carried out in all departments of the hospital.

3. That all moneys received in the various d
of the hospital are regularly paid over to the chi
officer and that the system in force in each depart
be subject to examination by such officer.

4. That certain specified returns shall be pre
presented to the finance committee at stated tim
will include at least the following: (*a*) the budge
ment of estimated income and expenditure; (*b*)
statement comparing the actual with the estima
and expenditure, showing clearly all cases of ove
and under-spending and explanations of the o
cerned; (*c*) interim comparative statements of
expenditure; and (*d*) a summary of expenditure
costs, on a departmental basis.

5. That the finance committee shall allocate or
department or spending committee up to an am
approved estimates.

6. That no excess expenditure over sanction
without submission of a report as to the necessi
excess expenditure being made to the committee a
committee's approval by resolution has been obta

7. That a system of stores accounts be institu
view to securing effective control over all c
received, in custody, and issued for consumption.

8. That all work or articles the cost of which i
to exceed £*x* shall, unless purchased under a
contract already approved by the finance commit
subject of a resolution of such committee as th
for incurring such expenditure.

9. That purchases may not be made or wor
outside contract except on the authority of the
made after submission of requisitions from the var
ing committees or departments showing the goo
required and the estimated cost. Where such co
to exceed £*x* the goods shall, where practicable, be
or the work done by competition.

10. That orders for goods or work required to be
be prepared in the secretary's department, and
orders shall be on official forms.

11. That all accounts, duly certified by the he
appropriate spending departments, shall be delive
office of the chief financial officer at least . . . clear
the date of the meeting at which they are to be p
payment; and that all such accounts, salaries,
shall be subject to examination by the chief fina
before being submitted for approval.

12. That all contracts, tenders, &c., shall be op
first instance by the finance committee.

13. That no expenditure of a capital nature by
mittee or department of the hospital be incurred un
has been made to the finance committee on th
and as to the full estimated cost involved, inclu
tenance, and a resolution passed by the finance
approving such expenditure.

14. The chief financial officer shall report to t
committee any excess expenditure on contract
undertaken by own labour as soon as such
ascertained to have been incurred.

15. That all motions which may involve directly o
expenditure not otherwise provided for or increase
ture, or which would interfere with the financial p
hospital, shall stand referred to the finance com
consideration and report to the committee or b
any steps are taken.

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* Third of a series of articles. The first appeared on July 30 and the second on Aug. 13.

In England Now

ning Commentary by Peripatetic Correspondents

loch was shallow, but not so shallow that you ade it all. " Do ye wish a poat ? " asked Wullie. sh a poat and he went off to look for one, leaving ing from the shore. By the time he returned hree trout. " I have found a poat," he said, ie's no a very goot poat," he added cautiously. pected the poat. She was one of those flat-ed dinghy types with a pointed nose, intended y one person only. Gingerly we embarked and in the mackintoshes and fishing gear. Of course niel bitch elected to come too, so when we were e had about an inch of freeboard.

you swim, Wullie ? " I asked. " Not a stroke," ied, as though proud of the fact. We pushed at once began to take in water over the side om below. The bitch, resting her forepaws first gunwale aud then on the other, did not make diness ; each time she changed position we made a gallon. Our feet were soon awash, and the bag, floating around the blunt end, was playing polo with the mackintoshes. By this time we omewhere in the middle of the loch and could the bottom. " Better make for the shore," Each taking an oar we stood up and paddled. less uncomfortable than sitting up to the hips er.

nty yards from land we foundered. The bitch acefully in and swam ashore. Clutching my is rod I enjoined Wullie to hang on to something ruck out manfully. As I did so I noticed that was laughing fit to bust. " Hysterical, poor I thought—and bumped my knee on the bottom. been swimming for dear life in about three feet ter. Wullie, standing thigh-deep in the sunken continued to laugh. Everything was retrieved one crutch. We stripped and dried in the sun ind. Next day my tobacco was again smokable, ny matches strikable, and my watch—never very e—rather the better for the experience. " I *thocht* ass no a fery goot poat," said Wullie.

* * *

s morning one of my rare and prized private patients rged himself from hospital in a fury because n had refused to allow his small children to visit We discussed the matter amicably, and he gave me r, after which I went to give Matron a piece of ind. During the rather spirited interchange, in she defended the hospital rules—which also, ntally and barbarously, forbid parents to visit en—I became cloudily aware that some basic ple of the Universe was being unfolded. My ery that this was no less than the concept of Illness n coincided with, and was verified by, Matron's phant climactic remark about allowing children to very sick parents who were not expected to recover. see, we do temper Justice with Mercy." The l and scales became almost visible and I staggered the room.

an armchair after lunch I speculated further on the ct. The theme has of course been expounded by el Butler in *Erewhon*, where, you will recall, invalids sent to prison for their misdemeanour. Indeed, ever patients are nursed, particularly perhaps by nurses, this attitude is always latent and sometimes nes only too obvious when the nuisance is too much borne. Hence such behaviour in mental hospitals e saw in the *Snake Pit*. Unpleasant as this is, and as it must be deplored on civilised grounds, I do condemn it out of hand, for it is largely a natural lefence reaction.

e interesting fact is that my own small children the same viewpoint. Show them some victim of some luckless and legless individual, some cripple aralytic, and their immediate and uniform response Serve them right ! " After a longish period of failure vercome this callousness by reasoning I now realise t is at the bottom of it. Let us consider matters from child's angle. If it did not serve them right, if disease not suitable punishment for some crime, what possible principles of justice and order could reign in the Universe ? If suffering is without cause then there are no rules at all and anything may happen to anyone at any time. No, " Serves them right " is altogether safer and sounder than these shifting sands. The philosophical and religious questions concerned are not for the likes of me. I will merely adduce in additional evidence Camus's recent play *Caligula*, which has been rather misunderstood on this side of the Channel, for the portrayal of the emperor's vile and arbitrary cruelties seems to me to be based on the same human predicament. So unendurable does Caligula find the realisation of chance and meaningless suffering that he strives passionately to introduce at least some order and responsibility into the scheme of things by inflicting the punishments himself. One can sympathise with him.

Must we then conclude that crime and punishment, guilt and original sin, are concepts which, though not existing in the neutral Universe, are developed in self-defence in the minds of children ? Before accepting this it would be as well to remember that the little dears have incorporated all these charming notions in their superegos as the result of our parental admonitions and punishments. If they'd been brought up on proper lines we may assume that they would display much more of a savage or animal indifference to death and disease. At this point, appropriately enough, the thunderstorm woke me from my Saturday afternoon nap, as if to remind me of the advantages of having Olympian Jove as a public blame-taker.

* * *

In company with some other members of the Society of Applied Omphaloscopists (of whose scientific and social activities I have told you on previous occasions) I have been assisting at the meeting of our French colleagues, the Réunion Amicale des Frotteurs d'Arrières. It has been time and francs well spent. I heard complaint that a visitor heard nothing new, but years of association with the omphaloscopists has convinced me that a few hours of boredom on a hard seat—and French lecture-theatres are no more luxurious than our own—are the small affliction which wins the great prize of uninhibited gossip with our colleagues. The language difficulty was appalling to the point of absurdity, and it is small comfort that our neighbours are even worse linguists than ourselves. In the evening the president of the R.A.F.A. and his charming wife filled us with costly groceries and delicious intoxicants, and, to your correspondent at least, to cross the domestic threshold is the summum bonum of travel. At other times we sauntered freely and ate most expensively, the two occupations in Paris most suitable and rewarding to the elderly. How was the town ? The Americans are still in the Select, the Palais Chaillot is still the most comely of all modern buildings, the river still runs serenely under that arcade of lovely bridges. There are (of course) no new writers, no new painters ; but there are more forebrains working to capacity between Montmartre and the Lion of Belfort than anywhere in Europe. And I met a young man working with improvised apparatus in a dusty attic on a tweenymaid's salary ; if he lives we shall know something.

* * *

The following case-note was written by a Spanish refugee. I wish patients who write in their mother tongue were always as lucid.

> " On the 22nd Fibrery of 1945 Juan fold ill with high fiver. The Dr. during a month could not understand his illness and pronostiqued gastrigue, a month later geve the true pronostic, a pleurisie. So on 22.3.45 my wife cononduced him from M— to the clinica where he was opered at the same day of his arrival. From his body went out $1^1/_2$ litre of pus and had a pipe from in his back hole in order to let the liquid going out, but as he was allways in a high degree of fiver and the pus did not go quick enough on 21.4.45 the Drs decided to enlarger the back hole in accordance with the liquid remained still in the body. On 23.5.45 the Drs seeing that the previous operations have not been onough they made the last opperation at which they enlarged more the hole, whereby they did cut some pieces of bone. Then began the recovery of better and better state of health. A month later the back hole did close itself and two months after he was unknown by the Drs who were at his care, and now a day happily we think he is very healthy."

self-pity and despair threatened to take over. The day on which Me 1 and Me 2 first briefly coalesced brought a peace which perhaps only those who have been mentally ill can understand; though I expect a painless day to other Disabilities is an equally joyful experience.

I went to another psychologist. I was anxious to coöperate and I think I did. Some relief came simply from knowing that my sickness was not uncommon, that someone could at least understand what a panic could do, even if he could not altogether appreciate what it could be. It isn't always much help, if one is physically ill, to know that a lot of people are ill in the same way; but I found it most helpful to know that my neurosis was not an isolated or isolating thing. This is related, of course, to the fear of insanity; and the assurance that I was not likely to lose my wits acted like a supporting plaster, though I could not at once rely on it and still very occasionally mistrust it. This kind of psychotherapy—a sharing of the private burden—helped me to recover enough to know that work would restore some self-esteem. Though my mental capacity was never affected, my confidence was low and my energy limited. I took a whole-time responsible job, but I had to fight my symptoms every moment of the day. I was in despair. The psychologist suggested that I should take on a job in which he was professionally interested, in addition to the one I was doing. Then I knew I was neither dying nor insane. I believed I might recover, I almost believed that even disabled I was still a useful person. I took the job. That was one of the best bits of psychotherapy I have come across. A great fillip followed: a doctor friend told me "the natural tendency of a neurosis is to recover." This, I thought, sounded like experience and not mere encouragement. I did Coué with this phrase and it almost replaced German verbs.

For three years I had been unable to make a train journey alone. I now felt it was essential to my self-esteem to do so successfully. I arranged the journey carefully from one place of safety to another, had all my terrors beforehand, and travelled as if under light anæsthesia. I cannot say I lost my fears as a result, but I realised I could do what I had been unable to do.

Soon after this I had to learn to drive a car. I had always wanted to, but now I lacked confidence. I also knew what it was like to be a pedestrian casualty. My instructor was sarcastic and gloomy, but I passed the driving test without difficulty. Driving a car has been first-rate occupational therapy. That sounds irresponsible, but in fact the new responsibility widened my confidence, and fear developed into careful judgment. The vagaries of an old car ensured that the therapy was occupational. Waiting in traffic blocks brought at first a return of panics—and there was no running away.

My deepest terrors all this time were my own; but my behaviour at home, where I felt safe to take off my cumbersome armour, was distressing, and I know that only a saint can play successfully the rôle of neurotic's companion. That someone should play this part, however, is vital to the patient's comfort. A neurotic is disabled in the very part he must use to effect his recovery. Sometimes he is as good at it as at lifting himself by his own bootstraps, and he is lucky indeed if his home is a springboard of unalterable affection, encouragement, and good temper. Mine is; it remains resilient against despair, shame, and fear. I still do not find it easy to accept my neurosis as being no more my fault than a paralysed leg. Perhaps if I could wear a bandage round my head I should feel less ashamed. Perhaps if people did not say so freely "You're all right. You just want to pull yourself together" it would be better. It is, unfortunately, still necessary to try to hide one'
from most people.

Growth of insight has helped me greatly.
logy didn't cure me it gave me some idc
the mind works to avoid, and protect itsel
painful thoughts. I understood this and
personally as soon as I could. Now, like other D
I have my methods. The essentials are my
depots—people or places. The safety radius
grows longer and longer. I am still claust
that rules out underground trains for me,
the District Railway. I find it difficult to mee
and childhood friends, and to go to places
lived or worked when I was very ill. But I ha
to make short visits to give me a sense of ac
and to follow them when I am ready for it b
visit. Both people and places are shrinking to th
size. Depression usually returns about a w
menstruation, and I have learned to remind m
life will look different when my period begi
when I am depressed or disturbed I can trace it
I associate my dream symbols easily now and a
to recognise the particular source of anxiety they
I have also learned that agitation or irritabi
trifles usually hides a deeper anxiety which can
into the open, where it is much less formidable.
learning not to be a perfectionist—that it is
to admit to anxiety about things I have alwa
told myself are trifles to be ignored. Many
I find, are common fears.

If I am fearful of going anywhere strange t
friends I invite them home instead, or mee
a familiar restaurant. I am grateful for their fo
Strangers, too, can be more helpful than t
and I have used them deliberately: a ch
conductor, a kindly shop-assistant, can help
a mounting panic and bring the world into fo
If I have something difficult to do—to make
alone, to sit trapped under the drier in a ha
or to make a public speech—I know I shall be
and acutely afraid beforehand. I avoid tryi
too high meanwhile. When the time comes
myself by recalling my past victories, remi
that I can only die once and that it proba
be so bad as this, and accept a slight return of M
My family take 'Luminal.' The actual exper
is not much worse than severe stage fright, and i
sees me to the wings I totter on. Surprisingl
seems to notice. If I am suddenly called
what I could not do deliberately, I [illegible]
to do it first and have the fright afterwards
people do.

I know that I have reached another stage
writers of other articles in this series have imp
with their courage and resolution in accepting
work of limitation—even though they i
enlarge it. But I dare not accept my sicknes
because it never stays arrested. My very safe
become distorted and grow into symptoms t
I must therefore break down as I go along
I build up; otherwise the habits of respons
or avoidance of occasions of fear, can be as
as the fear itself. Indeed I feel tolerably
many of my symptoms now are the result
pattern and that there is less ground than I
my terror of falling back into the paralysing pa
So now I hope to go forward from that.

". . . Everybody knows that a few imperfect sta
a little biased observation point ominously to a
which the bulk of the population (apart from th
army of survivors from happier days) will consist of
more highly educated imbeciles of lower and lowe
but nobody really believes it."—*Times Literary S*
Aug. 5, 1949, p. 503.

S.A. and will soon have it available for distribution ır side of the Atlantic.

studies upon consecutive unselected cases[3] have been criticised on the basis of lack of "controls." ere interested to notice that Professor Boyd could e a "considered opinion" when his group had asly not yet used controls. We believe this is an ıce of medical good sense, is in the most ancient ıumane tradition of our profession, and enables people to receive help much sooner than they wise would. Our patients have always been private ıts and we think there is a very obvious question dical honour involved in treating groups of private ıts as "controls." Controlled studies can be ating things. After an address one of us recently in Salt Lake City we were confronted by an rate controlled study proving that nitroglycerin for elief of angina had no value.

hope that the wide implications of the Boyd report e realised by the whole Manchester school.

WILFRID E. SHUTE
don, Ontario. EVAN V. SHUTE.

MALLEOLAR FRACTURES

ı,—Mr. Herzog's article of July 9 might have oked my temper, normally excitable on the subject alleolar fractures, to a reply, had I not felt that annotation on the subject did much to correct his s and draw attention to the importance of the ıents around the ankle-joint in the mechanism of y. In particular, his diagram (figs. 3 and 4) showing possible shift of the fulcrum in adduction injuries rs from a failure to insert the collateral ligaments. fulcrum will obviously vary in position according hether the fibular collateral ligament remains intact ot. The pattern of malleolar fractures, so variable complex, is determined not only by the type of eolar strain to which the joint is subjected but by sequence in which the ligaments are ruptured, and the clinical value of familiarity with the radiographic arances is the facility with which the ligaments ured, and the mechanism, can be worked out. not only builds up in the mind a correct appreciation ıe soft-tissue damage, which, if the fractures involving articular surface are excluded, greatly outweighs n in importance, but also assists in the diagnosis igamentous injuries without fracture.

e suffer from a lack of agreement in the terminology l in relation to the ankle, in regard to results and to hanism. Thus tibial flexion, inversion, and adduction used synonymously by some authors, and with erent shades of meaning by others. We have not pted the easy French term "mixed oblique" for the nsy "first-degree external rotation fracture" of the la. Much unnecessary controversy has arisen from onfusion of meanings, and much from a failure to limit implications of the words used. The distinction ween the direct side-to-side movement of the talus, l the rotation around a horizontal anteroposterior s implied by abduction and adduction, is very essary, and I have used the words medial and lateral ft to imply this. It is certainly possible that if the le were supported externally this movement might ult in the bimalleolar fracture described, in which h malleoli were fractured transversely at the level the tibial *plafond*, but such a combination of events ould come under the head of direct violence during ich anything is possible, and our more interesting eculations are usually limited to indirect violence. a product of indirect injury, I have never seen the ion described, but a similar lesion may be produced by forced plantar flexion of the foot, though even then the fracture of the medial malleolus tends to be oblique in the lateral view. This explanation has weight of cadaver experiment to support it.

It is, however, with Mr. David Thomas (July 23) that I wish to cross swords. That the shade of Dupuytren should again cross the fields through which he strode of right of personality and opportunity rather than by scientific knowledge 150 years ago, proves how difficult it is to lay a ghost. On the strength of the patients' "stories" (my inverted commas) concerning 41 isolated fractures of the fibular malleolus of which 66% conformed to external rotation type of injury (the figure for a wider series is 70%) Mr. Thomas wishes to revive the theory that these are due to inversion strain. The sole fact adduced in support of this is the statement that "inversion strain is by common experience the most frequent indirect violence to which the ankle is subject." We cannot assume that this is therefore the most common form of violence producing fracture, but if we wish to draw such an analogy, we could take Thorndike[1] as an observer with whom most others are in agreement, who states that the commonest sprain of the ankle is a sprain of the anterior tibiofibular ligament, and deduce from this that the commonest form of fracture is likely to be due to external rotation or abduction, the only means by which this sprain can be produced.

Maisonneuve[2] had, I thought, settled this problem in 1840, though his conclusions were only very reluctantly accepted. As the result of a fortunate post-mortem examination on a fracture of the ankle, he showed that:

1. The fracture line was oblique from behind downwards and forwards.
2. That there was an accompanying rupture of the anterior fibres of the capsule and the *anterior fibres of the deltoid ligament.* (It was an external rotation fracture with displacement, and not the subperiosteal type.)
3. Only external rotation opened up the fracture line, and reproduced the deformity first seen.

This can be confirmed by anyone who examines a suitable case under anæsthesia with the assistance of radiography.

Are we also to neglect the numerous cadaver experiments, and the light they shed? Cadaver experiments are open to many errors, but on some points, such as the relation of the shape of the fracture line to the mechanical stresses employed, they are unanswerable. The largest series of experiments was made by Hönigschmied.[3] In 17 cases of adduction strain he produced 5 transverse fractures of the fibula at or about joint level and 12 cases of rupture of the fibular collateral ligament. By external rotation (22 cases) he produced 12 cases of the oblique or first-degree external rotation fracture, 8 cases of diastasis, and 2 of ruptured ligaments. Strangely enough, 5 of these were low oblique fractures, and 7 of them half oblique half transverse—i.e., the fracture line escaped anteriorly below the level of the tibial plafond in the first group, and took a transverse course from the centre of the fibula to the anterior margin of the fibula at the level of the tibial plafond in the second group. In the preradiographic era Hönigschmied was unaware of these finer clinical variants; and the fact that they are now encountered regularly, though in different proportions, in any series lends weight to his observations. I know of no experimenter who has produced this fracture by inversion.

Mechanical considerations based on the shape of the fracture line are also almost unanswerable. The shape of the majority of fractures is helical ("spiral" is the common though incorrect term) or shows a helical element. A helical fracture can only be produced by torsion, and I defy anyone to produce torsion of the fibula by inversion. Maisonneuve's analysis of the

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Shute, W. E., Shute, E. V. Proceedings 2nd International Conference on Vitamin E, New York 1949. Shute, E. V. *Seminar* 1949, 1, 32.

[1] Thorndike, A. Athletic Injuries. London, 1942.
[2] Maisonneuve, J. G. *Arch. gén. Méd.* 1840, 7, 165, 435.
[3] Hönigschmied, J. H. *Dtsch. Z. Chir.* 1877, 8, 239.

Letters to the Editor

MECHANICAL RESPIRATION IN POLIOMYELITIS

SIR,—I have followed the contributions of Dr. Blackwell (July 16 and 30) and Dr. Ritchie Russell (July 23) with close interest, but feel that readers who encounter severe bulbar poliomyelitis for the first time may still be at a loss how to manage a case to the best advantage. Respiratory embarrassment, which may be of peripheral or central origin, or occasionally of both, is usually complicated by pharyngeal paralysis and troublesome accumulation of secretions, by a tendency to pulmonary collapse and pneumonia, and by cardiac failure of central origin. The cardiac failure may be accelerated by posture, which may aggravate œdema in the pons-medulla caused by the lesions inflicted by the virus—a condition somewhat similar in its effects to that found in late post-diphtheritic paralyses. Hence in bulbar cases frequent postural change, combined with intelligent use of the suction apparatus, is preferable to continuous tilting; it is safer when giving gastric feeds by nasal tube, and it is more comfortable to the patient. A recent case in a child of 13, characterised by alternating periods of coma and extreme motor restlessness, responded well to deliberate dehydration, intravenous administration of 50 ml. of 25% glucose four-hourly (6 injections), and systemic penicillin.

The Bragg-Paul apparatus, providing positive pressures, may prove better for such cases than the Drinker as a source of sustained mechanical respiration, while Eve's tilting or similar improvised stretcher will serve for short periods; a bronchoscopic table is rarely available for the purpose even in large hospitals. As regards the Oxford inflator, a serious defect is the absence of an easily controlled device for adjusting the degree of positive pressure applied to suit different ages and conditions. It should not be difficult to make a modification incorporating both this and automatic control such as is available on the McKesson apparatus. Perhaps the Ministry of Health might be induced to sponsor such an apparatus and a tilting bedstead with cot sides manually or mechanically operated, and so continue the tradition which the London County Council started 15 years ago when they secured a number of specially designed, stoutly constructed, Drinker-type machines which still give excellent service.

WILLIAM GUNN
Physician, Infectious Diseases Department.

North Western Hospital,
London, N.W.3.

LIVER EXTRACTS IN PERNICIOUS ANÆMIA

SIR,—I have followed with interest the correspondence referring to the relative potency of British and American liver extracts, more especially because I have spent the past year in visiting various hæmatological clinics and laboratories in the United States; before that I saw very many patients with pernicious anæmia at the blood clinic at Edinburgh Royal Infirmary. I have seen nothing to suggest that there is any greater tendency for the patients in Edinburgh to relapse while under treatment with British extracts than for those at various clinics in the United States to relapse while under treatment with American extracts.

I should also like to add to the warnings given against any attempts to label liver extracts at present in terms of their vitamin-B_{12} content. It has been suggested by Stokstad et al.[1] that thioglycollic acid and other reducing agents, when added to the medium for the growth of *Lactobacillus leichmannii 313*, increase many times the growth response produced by vitamin B_{12}. My own experience and that of others in performing such assays suggests that there may be considerable variatio
response to the addition of such reducing agents,
depending on variations in technique, in orga
in other constituents of the medium; it may
the case that thioglycollic acid protects active
B_{12} against destruction during autoclaving of the
as has been suggested. Thus we have here a
in technique which may give a very marked
in the apparent content of active vitamin B_{12}.

Moreover, as has already been said in this
pondence, it has been shown that several fac
replace vitamin B_{12} in the growth of *L. lactis*
and *L. leichmannii*. Either these must be rem
paper chromatography, or the vitamin B_{12}
destroyed and a second estimation carried out.

Finally, although vitamin B_{12} is an extremely
hæmatopoietic substance that has been isolated
liver, it is by no means proven that vitamin B
pteroylglutamic acid are the only active factors i
extract prepared for oral administration or paren

Intensive investigations of these matters are
carried out at many centres and at present the only
assay method of liver extracts is the clinical on
batch being tested separately. When it is decide
a satisfactory assay method has been developed
labelling of liver extracts in terms of their vit
content, and if it is considered that such labelling
a true indication of anti-anæmic potency, it is
that exactly the same method of assay should be
used.

Meanwhile, if a doctor considers that the liver
which his patient is having is not potent it w
helpful if he would send a sample, or at least a
the brand and the batch number, to the clinic to
the patient is referred, or to the manufacturers co
so that further investigations may be carried out.
cases of idiopathic refractory megaloblastic anæ
very rare, and such a diagnosis can only be made
the patient has been fully investigated and
adequate test dose of a batch of liver extract th
investigator has already himself shown to be fully
in other patients with true addisonian pernicious
Such has always been the practice in investiga
these patients in Edinburgh.

Ann Arbor, Michigan, U.S.A. RONALD H. GIRDW

VITAMIN E

SIR,—We were happy to see in your issue of J
that Professor Boyd and his surgical group at Man
have joined the lengthening list of those wh
vitamin E. Many British physicians have used i
happy results in Buerger's disease, and the latest
on the subject—that by Pennock,[1] of Pittsb
the recent New York conference—was also encou

We find ourselves at a loss to understand the
but gratuitous reference in the opening sentence
Manchester letter. There can scarcely be medical r
for it. All that we have previously said about
mittent claudication was to quote[2] the work
colleagues of ours and to add this one sentence:
have had a good result in the only case we have
ourselves." It would seem that those who adopt a
and confirm it should be the last to condemn it, p
larly when it points the way to a very simple and
way out of a difficult problem.

We believe that good preparations of vitamin E
are more expensive in England than here. Ho
We understand that very soon this will not be s
since a prominent pharmaceutical manufacturer
British Isles has received permission from your Mi
of Health to import natural vitamin-E distillate

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[1] Stokstad, E. L. R., Dornbush, A. C., Franklin, A. L., Hoffman, C. E., Hutchings, B. L., Jukes, T. N. *Fed. Proc.* 1949, 8, 257.

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[1] Pennock, L. L. Proceedings 2nd International Confere
Vitamin E, New York, 1949.

[2] Shute, E. V., Vogelsang, A. B., Skelton, R., Shute, W. E.
Gynec. Obstet. 1948, 86, 1.

ere very painful. The face became suffused and the tivæ injected. About ten minutes later she complained ise itchiness of the skin, especially the face and scalp. ut of coughing lasted for about 1½ hours after which ped fairly suddenly. She then became fevered, the ature rising to 105°F by 4 P.M. An hour previously thematous blotchy rash had appeared, involving ally the whole of the body but most marked on the mbs. The rash began to fade after an hour and had tely disappeared on the following morning, by which ne felt quite well and the temperature was normal. her P.A.S. had been given, but at 4.30 P.M. on July 18 of 3 g. was again given. An almost exactly similar picture developed, but on this occasion the symptoms nced ten minutes after taking the drug. At 11.30 A.M. 19th a further dose of 3 g. produced a similar chain of commencing within two minutes of the drug being Further doses at 2 P.M. and 4.30 P.M. produced similar ns. A further 3 g. dose on July 26 produced the same me with the addition of vomiting, the reaction beginning iately after taking the P.A.S. A patch test using a olution of P.A.S. evoked no reaction and there was no ohilia.

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is interesting that the prominent symptoms of , skin irritation, and ceaseless violent unproductive ning which characterised the case reported by Hemming and Stewart were also observed in the now reported. In view of the increasing use of . it is important to know that desensitisation is ble should the necessity for it arise. Perhaps if r doses of the anti-histamine drugs had been given, could have been given in full dosage much more dly. Again, more rapid desensitisation might have achieved by increasing the dose more quickly in the stages. We were, however, unwilling to try to en desensitisation lest the unpleasant sensitisation tion recurred, thus forcing us to begin all over again ven to abandon the attempt.

partment of Tuberculosis,
niversity of Edinburgh.

NORMAN W. HORNE.

R,—I was interested in the report by Dr. J. N. Swanson y 23) on the occurrence of hypoprothrombinæmia ng treatment with p-aminosalicylic acid. In drawing ntion some time ago,[1] to the possibility of hypo- hrombinæmia, I suggested the simultaneous adminis- ion of vitamin K or its analogues for whatever ective effect they might have—especially to patients iving P.A.S. in high dosage over long periods or in m hæmorrhages such as hæmoptyses might be ected.

r. Swanson says that in several of his patients the od-prothrombin levels were determined by a method g viper venom as a source of thromboplastin. It been repeatedly shown,[2 3 4] however, that this test s not in fact measure the prothrombin content of plasma, and that the prothrombin percentages ulated from its results are considerably higher than true values obtained by using Quick's method of thrombin estimation. The dangers of accepting ures based upon the snake-venom test have also been previously stressed.[5 6] Probably the degree of hypoprothrombinæmia developing in Dr. Swanson's patients while under treatment with P.A.S. was much greater than actually reported—a fact which adds considerably to the importance of his observation that a potentially dangerous hyproprothrombinæmia can develop during administration of P.A.S.

Woodford Wells, Essex.

JAMES A. O'CONNOR.

THE MEMBERSHIP

SIR,—All of us, particularly prospective candidates, will welcome the changes to be made in the membership examination as described in your issue of Aug. 6. But the committee have left at least one unresolved problem—that of a possible essay question—and have inserted a brief but familiar lament over the standard of English in the papers. That the standard is deplorable I have no doubt, but this is scarcely surprising considering the conditions under which the papers are written. The candidate is required to produce four well-balanced polished essays of moderate length in three hours, an exacting task even for a professional writer. Might I suggest that if the time for the examination were lengthened to, say, four hours, and that if a limit were placed on the number of words allowed per question (say 700), then the candidates would be able to turn out more "finished" replies, and the examiners might be able to broaden the scope of certain questions? The examiners would still retain the opportunity to test the candidates' mental agility in the vivas, and would save themselves time and trouble in the correction of the papers.

St. Thomas's Hospital, London, S.E.1.

H. E. M. KAY.

VASOMOTOR RHINORRHŒA TREATED WITH ANTHISAN

SIR,—In the paper you published last November[7] we reported that 19 of 35 cases of perennial vasomotor rhinorrhœa treated with 'Anthisan' derived complete symptomatic relief with reversion of the nasal mucosa to normal appearances. Six months after this initial course of treatment the patients were still all symptom-free without any further treatment.

Fifteen months after treatment we have followed up these 19 cases which were clinically and histologically cured. Of the 17 who reported (4 by letter), 14 were still symptom-free and 3 had return of symptoms. This means that of the 35 cases originally treated 14 (40%) had complete symptomatic relief for a period of fifteen months.

The 13 patients who attended were examined, and the findings were as follows:

No.	Condition during the past year	Appearance of nasal mucosa	Nasal secretion	Result of biopsy
1	well	slightly pale	dry	negative
2	well	normal	dry	negative
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4	well	normal	dry	negative
5	well	pale, allergic	mucoid	negative
6	well	slightly pale	dry	negative
7	well	normal	dry	negative
8	well	slightly pale	dry	negative
9	well	normal	dry	positive
10	occasional upset	pale, allergic	dry	borderline
11	well	normal	dry	borderline
12	well	normal	dry	borderline
13	well	normal	dry	borderline

It will be seen that though 11 were free from symptoms, in only 7 were nasal appearances completely normal, for in the other 6 the mucous membrane was somewhat pale and moist. In 5 cases nasal biopsy

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1. O'Connor, J. A. *Post-grad. med. J.* 1948, 24, 455.
2. Biggs, R., Macfarlane, R. G. *J. clin. Path.* 1949, 2, 33.
3. Mawson, C. A. *J. Lab. clin. Med.* 1949, 34, 458.
4. Biggs, R., Macfarlane, R. G. *Brit. med. J.* 1949, ii, 296.
5. Lempert, H. *Ibid*, 1948, i, 125.
6. James, G. A. *Ibid*, p. 475.
7. *Lancet*, 1948, ii, 806.

forces developed between the malleoli can be proved mathematically, but is most readily demonstrated by his "two book" experiment. Place a ruler between two parallel books of equal weight and move it to either side. The book whose forward edge is pressed on by the ruler moves. Thus internal rotation-inversion or medial slide produces the vertical adduction fracture of the medial malleolus, a comparatively rare injury, and external rotation-abduction the external rotation fracture. Of the first-degree external rotation fracture there are three clinical variants, met with in my series of 126 cases in the following proportions:

1. Long sloping fibular fracture [illegible] between the anterior and posteric [illegible] to emerge anteriorly below the tibial plafond, and showing an unquestionable helical element (30 cases).
2. A shorter more oblique fracture, with a less marked helical element (81 cases).
3. A half oblique, half transverse fracture as described previously (15 cases).

These variations are most probably due to the variation in the element of abduction in the fracture, and the varying degree of descent of the anterior tibiofibular ligament on the malleolus.

If further evidence is needed, the additional fractures in the second-degree and third-degree cases frequently only allow of one explanation—external rotation under body-weight. Thus of Mr. Thomas's four groups of cases, group 1 are external rotation fractures, groups 2 and 3 adduction fractures, and group 4 due to external rotation in which the anterior tibiofibular ligament has yielded, permitting a partial diastasis, and corresponding to the "low Dupuytren fracture" of many observers.

I too have found that the mechanism of injury is often attributed by the patient to inversion—possibly because inversion starts the fall which leads to either external rotation of the foot on the fixed tibia or internal rotation of the tibia on the fixed foot. The injury occurs so quickly that few patients can describe it, and practically none enlarge upon it. If badgered they fall back on the simplest mechanism they understand. I hate undermining the confidence of a doctor in his patient in days when there has been so much talk of the loss of confidence of the patient in the doctor, but I would like Mr. Thomas to join me in being a complete sceptic with regard to the patient's story in these cases.

Northwood, Middlesex. J. G. BONNIN.

POLISHED FLOORS

SIR,—May I call attention to the peculiarly foolish practice one finds everywhere in hospitals and institutions for aged and infirm persons—namely, making floors slippery.

Hospital patients are not as a rule familiar with slippery floors; they do not have them in their own homes. In the day-time they manage fairly well; but in the night they get out of bed, entirely forgetting the danger, and often fall down, sustaining fractures, usually of the hips. Old people as a rule do not long survive this injury. It is, of course, uncertain whether this is the desired result; but everyone quite certainly knows it is of very frequent occurrence. It causes a lot of work and worry to the resident doctors, often called up in the night to render first-aid; and a good deal of extra work for the nurses and expense in materials used on these fracture cases, also X rays.

It seems that the sight of shining floors gives great satisfaction to medical superintendents, matrons, and members of committees. One of these said recently, "Oh! but unpolished linoleum looks so *dreadful*." This adjective might more truly be applied by the victim to the slippery floor.

VERITAS.

COMPLICATIONS OF PARA-AMINOSALI ACID THERAPY

SIR,—In their letter of July 23 (p. 174) Dr. E
and Dr. Stewart described some hitherto
complications of *p*-aminosalicylic acid (P.A.S.)
May we add a further side-effect from our own ex

Zarafonetis and others[1] observed a reducing s
in the urine of patients treated with *p*-amin
acid (P.A.B.) which could be identified as gluc
have observed a reducing substance in the ur
1–3 days of P.A.S. treatment which usually di
2–3 days after discontinuing the P.A.S. The
substance may still be detectable at a time w
urine no longer contains P.A.S. In two of o
the reducing substance was still present 10 and
after the end of P.A.S. therapy. In these two
reducing substance was identified as glucose.

According to published data,[2] [3] P.A.S. is not
in the form of glycuronate in man. Bray and
isolated a reducing substance from the urine of
receiving P.A.S., but no data have been publis
cerning the presence and nature of the reducing s
in human urine during P.A.S. treatment.

We have observed a reduction in rats' urine
administration of both P.A.S. and P.A.B. and al
aminobenzoic acid, but *p*-aminohippuric acid,
benzolsulphamide, and sodium oxybenzoate had n
effect. We showed,[5] with our colleagues Koltay,
and Majoros, that during excretion of the
substance kidney alkaline-phosphatase activ
significantly enhanced. The reducing substanc
rats' urine was not investigated in detail.

Further investigations were carried out in
the method of partition paper chromatography
recently in this journal.[6] In no further case
prove the presence of hexose or pentose, the
urines were strongly reducing. Even glycurona
not demonstrable.

On the basis of our experiments we suppose t
treatment sometimes gives rise to normoglycæm
suria. In the remaining cases some at present
metabolite seems to cause the reduction. A s
probably the same, is able to darken the urine,
not homogentisic acid. Further investigation
progress.

E. KEL
Szeged University, Hungary. D. HAL

SIR,—In your issue of July 23, Dr. Hemm
Dr. Stewart describe a case of acquired idio
to *p*-aminosalicylic acid (P.A.S.). This prompt
report a further case of drug sensitivity occurr
patient being treated with P.A.S., particul
desensitisation was successfully carried out, the
being enabled to tolerate a dosage of 15 g.
daily without toxic effect.

Mrs. A, aged 28, was admitted to Southfield Sa
under the charge of Prof. Charles Cameron on July
She had bilateral pulmonary tuberculosis, more
in the left lung, and the disease had progressed de
rest and the carrying out of pneumoperitoneum an
crush. On July 6, 1948, 'Paramisal' sodium (Herts
ceuticals) was begun in a dosage of 21 g. daily. It
by mouth in 10% solution freshly prepared and
with liquorice. On July 17 (the 12th day of treat
12.30 P.M. (one hour after the administration of 3 g.
the patient suddenly felt generally unwell and
She was then seized with a violent intractable non-p
cough, her eyes began to ache intensely, and her

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1. Zarafonetis, C. J. D., Andrews, G. A., et al. *Blood*, 19
2. Way, E. L., Smith, P. K., et al. *J. Pharmacol.* 1948,
3. Venkataraman, A., Venkataraman, P. R., Lewis, H. B
   Chem. 1948, 173, 641.
4. Bray, H. G., Lake, H. J., et al. *Biochem. J.* 1948, 42,
5. *Orv. Hetil.* 1949, 90, 382.
6. Horrocks, R. H., Manning, G. B. *Lancet*, 1949, i, 104

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The 13 patients who attended were examined, and the findings were as follows:

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[5] Lempert, H. *Ibid.* 1948, i, 125.
[6] James, G. A. *Ibid.* p. 475.
[7] *Lancet*, 1948, ii, 806.

suggested some return of nasal allergy; for 4 had some eosinophils present and were considered to be borderline, and 1, which contained numerous eosinophils, was considered to be allergic.

We are indebted to Dr. R. F. Ogilvie and Dr. A. C. P. Campbell for their reports on the nasal sections; and to Dr. I. Simson Hall for advice and criticism.

Edinburgh. T. J. REID.
Dundee. R. B. HUNTER.

GUM-SALINE

SIR,—In connexion with Mr. Gibberd's letter of Feb. 26, I should like to mention that in 1937 Dr. H. Staub and I published a paper[1] on the action of colloidal carbohydrates on the circulating-plasma volume. Common starch, gum-arabic, and glycogen were assayed. Experiments made in dogs showed that glycogen (the preparations of Roche and Merck were used) in watery colloidal solution (20%), in doses of 0·25 g. per kg. given intravenously, raised the circulating plasma volume on the average by 21·7%. We believed that the colloidal nature of solutions containing glycogen would assure their retention in the blood-vessels. In another paper[2] I reported clinical observations on 4 cases treated with intravenous injections of 50–150 ml. of 20% glycogen dissolved in physiological salt solution; perfect tolerance was observed.

I suggest that more clinical trials should be made with glycogen solutions (20%). The solutions may be of value as a means of temporarily maintaining blood-volume. Glycogen is inexpensive, non-toxic, and possibly in addition supports the general detoxifying function of the liver.

OUP Pharmacological Department,
Bogotá-Colombia S.A.
KALMAN MEZEY.

SPONTANEOUS ALVEOLAR RUPTURE

SIR,—I read with great interest the two articles in your issue of May 28, on Spontaneous Pneumomediastinum in Pregnancy by Mr. D. J. MacRae and on Acute Mediastinal and Subcutaneous Emphysema by Dr. L. Fridjohn and Dr. P. G. Azzopardi. The impression left on the reader is that the authors of both papers regard Hamman[3] as the first to describe the ætiology and development of spontaneous interstitial emphysema in human pathology, although a few earlier writers are briefly quoted. May I therefore remark that I published four papers on this subject before Hamman, in the first of which, entitled the Symptomatology of Spontaneous Alveolar Rupture and its Consequences,[4] I thoroughly discussed the ætiology and symptoms observed in infants. I have never, however, claimed any priority in the description of the syndrome, for I knew that spontaneous alveolar rupture and its consequences were well known to Rokitansky,[5] the pioneer Viennese pathologist, as long ago as 1847. Roger, a French pædiatrician, observed and published cases of spontaneous rupture of the alveoli in 1862,[6] while Rauchfuss, the leading Russian pædiatrician of his time, described very well the ætiology and symptomatology of spontaneous alveolar rupture, in the first German handbook of pædiatrics in 1876–82.[7] In 1888 Friedrich Muller,[8] of Munich, gave a full account of the peculiar crunching sounds over the heart area. Dr. Fridjohn and Dr. Azzopardi say that "the first description of the peculiar crunching sound is credited to Muller (McGuire and Bean 1939) . . ." but add that "its full significance was recognised by Hamman (1937)."

My further contributions appeared in 1928 and In my last paper I mentioned that Guillot had two cases in early infancy in 1853–82.[12] My own tions, since I am a pædiatrician, dealt with rupture in infancy, and I observed that in born infants the function of the elastic fibres lungs may be impaired and the alveoli may rupture during attacks of cough. Alveolar newborn babies following artificial respiration not of course be considered spontaneous alveolar As to the heart, I described in infants weakness heart sounds due to interposition of air between and thoracic wall in the anterior mediastinum crunching sounds described by Müller could not

As the mechanism and ætiology of the so-call taneous alveolar rupture in infants and in identical or at least similar, I feel entitled to the above information.

Department of Pediatrics,
College of Medicine,
University of the Philippines.
EUGENE STRA

SAFETY IN THE SWIMMING-POOL

SIR,—I read with interest your leading June 18 and Dr. Laws's letter of July 16. I hav however, from personal experience, that (produced by the action of hypochlorites and can be used very effectively in the bacteriological of swimming-baths, especially those in the The one in most common use is chloramin or chloramine-T (sodium *p*-toluen which in salt-water baths is an excellent steriliser of the interaction of the sodium chloride and th amine. If used in fresh-water baths the add common salt adds greatly to its efficiency.

North British Laboratories,
Samlesbury, Lancs.
F. Th
Bacteric

POSTPARTUM PERITONITIS

SIR,—As a general practitioner I hesitantly following comments on the case of fulminating postpartum streptococcal peritonitis reported L. N. and M. H. Jackson in your issue of July 3

(1) A four-hourly record of the (mouth) tem would probably have shown pyrexia in the earlie of the illness. The pulse-rate was then only 80

(2) Abdominal rigidity is often absent or in puerperal peritonitis. The signs on the whole indefinite in the earlier stages.

(3) It seems unwise to rely solely on the sulp in puerperal infection. On the first suspicion of start penicillin therapy as well. Incidentally, good for the medical attendant's peace of min if subsequent events prove his fears to hav ill-founded.

Birmingham. W. M. CHE

SIR,—In the case reported by L. N. and M. H. the patient survived for $2^1/_2$ days after labour the temperature being raised on any of the occasions on which it was recorded.

From 1906 to 1936 the London Hospital isolation unit for severe cases of puerperal sep during the last ten years of its existence I majority of the cases admitted. During this p thirty years, which ended shortly before the intro of modern methods of chemotherapy, just ov cases were dealt with by this unit and the mortality was 25%. The absence of pyrexia w being encountered in a few cases of fulminati gangrene infection, and sometimes as a termina

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1. *Rev. méd. Suisse rom.* 1937, 57, 480.
2. Congrès de la Diurese, Vittel, 1939.
3. Hamman, L. *Trans. Ass. Amer. Phys.* 1937, 52, 311.
4. *Z. Kinderheilk.* 1924, 38, 479.
5. Quoted by Muller (rep. 6).
6. *Arch. gén. Méd.* 1862, 2, 129.
7. Gerhard's Handbuch fur Kinderkrankheiten. Tubingen, 1877-81.
8. *Berl. klin. Wschr.* 1888, no. 11, p. 205.
9. *Mschr. Kinderheilk.* 1928, 39, 104.
10. *Ibid*, 1930, 46, 109.
11. *Rev. franç. Pédiat*, 1930, 6, 764.
12. *Arch. gén. Méd.* 1853, 2, 151.

having been present in the earlier stages of the Some years ago I went through the records of it and did not encounter a single case of com- apyrexial streptococcal infection, although the coccus was the probable infecting organism in

authors of this report, in addition to recording clinical happening, have drawn attention to the ty of diagnosing peritonitis in the early puer- . The majority of the 250 fatal cases in the series ed from the records at the London Hospital came opsy, and severe peritonitis, even generalised, was post mortem far more frequently than its presence en diagnosed at the bedside. Owing to laxity of the inal wall, rigidity is often absent or very slight; ness is usually present but may be attributed to amed uterus; and some degree of ileus is frequently tered apart from peritonitis.

on, W.1. ALAN BREWS.

EXPERIMENTS ON ANIMALS

—The letter signed by Major Humeand five others, r issue of Aug. 6, raises a problem which none of afford to ignore if we wish to retain the confidence steem of the public in respect of our reputed eness. My own views are fairly well known my colleagues and go far beyond those so rately set forth by Major Hume. Nevertheless s to me there is a great deal in what he says that surely appeal to quite a large number of doctors, am convinced that it would greatly redound to our in the eyes of the public if we expressed this in certain terms. Many, even among ourselves, are forget that when vivisectional research was intro- from the Continent into this country in the middle t century it was the medical profession itself, sed through the editorial columns of the *British al Journal*, and more especially of *The Lancet*, protested most loudly against the unnecessary es involved, and I would strongly recommend e interested in the history of the subject to look journals for the year 1863.

long has it been asseverated by protagonists of l experimentation that all animals are treated he same care and consideration as that given to ts in hospitals and nursing-homes. A large part antivivisection propaganda is concerned with ng this claim as mere moonshine, to give it no r description. There have been in recent years e number of experiments in this country which, ms to me, fall into the same category as those by Major Hume. I am prepared to give full ces if they are required by anyone. Briefly they be described as those involving the exposure of sthetised animals to blast and poison gases, and cotised animals to traumatic shock and the effects rns of every description (observation being con- l for long periods). Other types of experiment e the introduction of various substances into the us humour with consequent inflammation and ng of the eyeball. All these, from their very , are bound to be accompanied by severe suffering severe, who is to say? As G. W. Theobald wrote r issue of July 16 "pain is a subjective sensation can neither be measured nor defined."

l this brings me to the absurdity of the "pain attached to British vivisection licences, on which ny (including it would seem even Major Hume) to place reliance when defending vivisection as sed in this country from the charge of cruelty. s: "If any animal at any time is found to be ing severe pain which is likely to endure, such l shall forthwith be painlessly killed." I have no tion in asserting that this provision is absolutely meaningless. Who is to determine what severe pain is; if the animal is suffering from it, what constitutes a period "likely to endure"—how long is it, an hour, a day, a week; and who is to say if the pain is *likely* to endure or not? It is beyond question that the interest of the experiment, the bias of the experimenter, and enthusiasm in the case of one truly desirous of finding something which *might*, in his view, benefit humanity, would all be factors which would weigh heavily in the balance against the merciful treatment of the animal under experiment.

Dr. Golla expresses the opinion that the public realises that experiments in this country "are invariably conducted with humanity." Believe me, they are by no means convinced, though many scientific experimenters would like to believe it is so; and the more the public becomes acquainted with the contents of the scientific journals the less convinced they will become. The only way to offset this is for a large number of influential authorities in science and medicine to do as Major Hume and his co-signatories suggest and express their detestation of those types of experiment, whether abroad or in this country, which, as he says, are shocking to a normal human conscience.

Camberley. M. BEDDOW BAYLY.

MIGRAINE

SIR,—It may interest some of your readers to know that I have had some success in treating migraine with isopropylnoradrenaline ('Neo-epinine,' Burroughs Wellcome). It will abort attacks in many sufferers and seems to be a safe and convenient remedy. The patient should, of course, be completely at rest for ten minutes or so while the drug is being absorbed and acting. I do not suggest that this is an efficient form of therapy in the very severe bilious types of migraine, which require a much more thorough investigation and other methods of control, but I believe it to be a useful adjuvant. It has the great disadvantage of producing palpitations in most of these patients, which is alarming to them and may make them unwilling to use the drug, as is the case in three out of five who have reported no benefit from it. Against this, twelve patients with established migraine find that it brings them a good measure of relief and carry a supply about with them.

Birmingham and Midland Eye Hospital, Birmingham, 3.
K. M. HAY
Clinical Research Assistant.

THE DOCTOR'S PROFESSION

SIR,—Parts of the second essay in this series (Aug. 13) are, I think, dangerous to put before young students and doctors who will eventually have to make vital decisions in future practice.

1. Why is mankind in toto cut off from God and therefore corrupted by disease and mortality? Is this not rather a hopeless attitude with which to enter the world?

2. The article says: "'He made all things good' and man in His own image as the crowning glory of the Creation." To preserve this divine gift of life is the ultimate end of medicine; yet (says the writer) the parable of the Good Samaritan is misunderstood. By whom? Am I to understand that I must allow pain and suffering to persist to the end that life may be prolonged? I think that there can be no misunderstanding that the writer imagines a Christian God sharing out the pain and suffering allotted to the world, more to some unfortunate souls than to others. Rather carefully he skirts round the question of euthanasia by talking of pain-relieving drugs which might hasten an inevitable end by a few hours. I wonder what treatment he would give to an incurable and inoperable case of carcinoma of the rectum? Would he claim that this was part of the punishment of mankind cutting himself off from God?

3. With regard to suffering we again note that "the Christian knows . . . that suffering is ultimately due to sin." Yet, though we must not over-indulge and create a mental gloating in suffering, neither must we go to all lengths to alleviate that suffering by the methods of modern medicine. Did Christ, or for that matter any prophet, suggest that we should employ our knowledge of medicine in the modern sense of a "go-slow" method? How many of our patients, if we are *honest* doctors, really become drug-addicts in the strictest sense? How blessed is the infiltration and nerve block in cases of inoperable growth and morphine to those in the agony of weeping through intractable pain!

The Christian, we are told, lives in a "fallen world": I cannot honestly see the meaning of the statement. If I have a dental abscess or an acute appendix, is this the ultimate outcome of my being a unit of a "fallen world"? Must I therefore live in this state of pain unalleviated that I may not be numbered among the valetudinarian, the unhealthy product of an unhealthy society?

4. Finally, I would put this question to the writer: Does he consider the newly instituted National Health Service, providing indiscriminate care for all, rich and poor alike, as the outward expression of an unhealthy society?

Manchester. H. J. A. SIMMONS.

SIR,—Your venerable journal appears to me to be entering a phase which is not, I hope, indicative of senile decay. Some of your leading articles on the National Health Service might have been culled from the *New Statesman*, and now you favour us with outmoded evangelical articles on Christian ethics, more worthy of the *Church Times*. Now these admirable periodicals are readily available to those who wish to read them, but many subscribers to *The Lancet* must prefer that you would stick to your last and serve us with Medicine untinctured by either politics or religion.

Sherborne, Dorset. JOHN WHITTINGDALE.

THYROID SURGERY

SIR,—By way of supplement to the interesting records published by Dr. J. W. Linnell and Mr. J. E. Piercy (July 23), may I mention the following cases which caused some diagnostic difficulty:

(1) *"Goitre" as First Apparent Manifestation of Reticulosarcoma in a Girl of 18.*—A girl of 18 was operated on for what appeared to be a nodular goitre. The histological picture proved unusual: the thyroid gland was invaded and partly replaced by tumour-like tissue consisting of numerous atypical cells with large irregular nuclei. No definite diagnosis was given and malignancy was suggested. The girl was seen at intervals and for about two years appeared to be doing well. She was then readmitted with general malaise and weakness, and died shortly afterwards. Necropsy showed masses of enlarged lymph-gland in the mediastinum. The left lower lobe of the lungs was densely infiltrated by tumour-like tissue. There were nodular secondaries in the liver. The thyroid region showed only fibrous adhesions. Histological examination showed a reticulosarcoma.

(2) *Late Secondaries after Thyroidectomy.*—A middle-aged woman was admitted with severe pain in her back. The lumbar spine was surgically explored and was found surrounded by tumour-like tissue. Examination of a biopsy specimen showed well-differentiated thyroid tissue. She had had her thyroid removed five years before her present illness for "goitre." No histological report of the thyroid gland was available.

Tuberculosis of the thyroid gland is, I agree, extremely rare. On the other hand, chronic giant-cellular thyroiditis is not so rare. This shows giant-cell systems which have been described as "typical" tubercles, and tuberculosis of the thyroid gland has been mistakenly diagnosed.

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Institute of Laryngology and Otology,
330, Gray's Inn Road, London, W.C.1.

I. FRIEDMANN.

RECURRENT MENINGITIS

SIR,—Dr. Norman's article of Aug. 13 reminc
a case of recurrent pneumococcal meningitis
observed over the last 3 years.

A woman, now aged 56, is suffering from ri
chronic otitis media, which heals for a time and
intervals.

Her first attack of meningitis started in Deceml
about 2 days after an attack of otitis media with
She spent several weeks in hospital and was
with sulphonamides and penicillin, making a
recovery.

The next attack was in April, 1948, following im
upon another attack of otitis media. She was tr
parenteral and intramuscular penicillin plus sulp
and again recovered completely, after only 3
hospital.

The third attack was in February, 1949. She w
pital 2 hours after onset, before the drum had p
and after combined penicillin and sulphadiazine
she left 2 weeks later fully convalescent.

In May, 1949, she had another attack of otitis
was sent immediately to hospital before definite
meningitis developed. A radical mastoidectomy
formed, but no gross ear disease was found. Radio
skull showed nothing abnormal.

The patient is now perfectly well.

Leicester. G. Fu

Public Health

Poliomyelitis

NOTIFICATIONS in England and Wales du
week ended Aug. 6 numbered: poliomyelitis 1
polioencephalitis 22 (22). Figures for the
week are shown in parentheses. Counties with
cases (poliomyelitis and polioencephalitis
were: London 31 (20), Bedford 5 (2), Berksh
Chester 3 (6), Cornwall 9 (8), Derby 2 (0), De
Essex 7 (8), Gloucester 5 (3), Hertford 3 (3), K
Lancaster 12 (12), Leicester 5 (5), Lincoln Linc
Middlesex 15 (13), Somerset 2 (0), Southamp
Stafford 2 (1), Suffolk West 6 (4), Surrey 7 (
West 2 (4), Warwick 5 (6), Yorks East Rid
Yorks North Riding 2 (1), Yorks West Riding
Glamorgan 5 (3), Monmouth 2 (2).

Some outbreaks with high attack-rates
paratively small communities are still being
but there is also a generalised rise in prevalence
of 1947. Fortunately the notifications in the w
review are 301 fewer than those of the corre
week of 1947. The figures are:—

		Poliomyelitis		*Polio*
1947, week ended Aug. 2	..	448	..	
1949, week ended Aug. 6	..	164	..	

Infectious Diseases in England and V

—		Week ended Jul		
	2	9	16	2
Cerebrospinal fever	23	39	17	
Diphtheria	80	103	104	
Dysentery	49	59	70	
Encephalitis lethargica ..	—	9	2	
Food-poisoning	111	477	199	1
Measles, excluding rubella ..	6087	5573	5376	50
Ophthalmia neonatorum ..	50	29	54	
Paratyphoid fever	13	32	50	
Pneumonia, primary or influenzal	377	316	330	3
Polioencephalitis	1	4	5	
Poliomyelitis	80	73	112	
Puerperal pyrexia	101	103	105	
Scarlet fever	1033	916	1044	11
Smallpox	—	—	—	—
Typhoid fever	1	5	6	
Whooping-cough	2260	2185	2184	20

Obituary

MAURICE NEWFIELD

M.R.C.S.

Newfield, who died on Aug. 13 at the age of 55,
man of talent and personality who, despite very
ealth, did valuable work for medicine and the
as author, journalist, and publisher. After service
first world war he qualified as L.M.S.S.A. from
g Cross Hospital in 1922 and took the Conjoint
ation the following year. He then held house-
tments at Charing Cross, and became a clinical
nt both there and at the Hospital for Sick Children.
any opportunities of active practice were closed
by ill health, and he turned more and more to
l journalism. One of his early ventures was the
medical section in the *Week End Book*, and on a
erious level he produced, in 1928, under the name
hael Fielding, a book entitled *Parenthood: Design*
ident, which long remained one of the most useful
its of birth-control. From 1928 to 1931 he was a
er of the staff of the *British Medical Journal*, after
he became publishing editor of the *British Encyclo-*
of Medical Practice and later managing editor of
h Hamilton Medical Books. He was also the editor
Eugenics Review.

. B. writes: "By his wide circle of friends, Maurice
eld will be remembered for many remarkable
ies. Most prominent among them, at least for me,
n indomitable courage in the face of a remorselessly
ping physical illness, and a shining vitality which
dily affliction could dim. His native vitality was
ive and wholly extraverted. It showed itself in a
lelight in his friends, about whom he loved to talk,
ring their peculiarities and expounding their idio-
asies with humorous appreciation. (He seemed to
out his friends as might a discriminating collector of
d'art, rejoicing in their rarity and their unique
s) It expressed itself in what was no less than a
mate interest in current affairs and events. It
flashes of imaginative wit and humour to his con-
ion, than which none was more entertaining; but
made him an unusually sensitive and attentive
er.

e had a penetrating intuition, a sort of sixth sense
ople; this, combined with unerring tact and with
usually shrewd judgment, made him a perfect
. He took an almost fierce pride in everything that
lited. His keen literary sense and the natural
of his thought made him an unsparing critic of
hoddy phrase, of the effort-saving cliché, of the
liced or muddled argument. Yet his kindliness and
nfailing courtesy enabled him to effect almost
al transformations in the material which passed
gh his hands and to incur nothing but gratitude
the many writers to whose paragraphs he gave
ice and finish. He was a man of perfect uprightness;
d, he was more than usually conscious of the ethical
ations of all actions, private no less than public.
ll never forget a short disquisition, arising paren-
ally from a quite different line of thought, about
thics of editing. He once told me—and I have
nt personal reasons for believing it to be entirely
—that, by the punctilious exercise of the editor's
gative throughout some three decades of editorial
he never lost a friend or had a quarrel.

here remains another quality which contributed to
vable character—an insuperable modesty. He
writing under pseudonyms. He did not in the least
his friends knowing about these pseudonyms; but
sliked publicity. Indeed, he shunned it much as
unned commiseration in his illness. With medical
gues he would sometimes discuss his symptoms:
e would talk of them with the same amused and
volent humour that he talked of his friends.
ver once heard him complain or say anything
aritable.

here can have been few literary personalities with
de a circle of affectionate and appreciative friends,
so concealed themselves from the reading public."

Newfield leaves a widow and a son.

ALBERT HOPKINSON

M.A., M.B. CAMB., B.SC. VICT.

Dr. Hopkinson, who died at his home in Cambridge on July 31, at the age of 85, was a blend of the Red and the White Rose; for his father, John Hopkinson, was a consulting engineer who became lord mayor of Manchester, while his mother was a Dewhurst of Skipton, Yorks. One of 13 children, he grew up in a tradition of family affection which his own children enjoyed in turn.

As a medical student at Emmanuel College, Cambridge, he took an active part in undergraduate life, gaining three college colours. Completing his clinical studies in Manchester at Owens College, he graduated M.B. Camb. in 1889, and after holding a house-appointment and the Bradley scholarship at Manchester Royal Infirmary he settled in practice at Withington, Manchester. Here he worked for many years and was greatly beloved; but after an operation in 1919 he decided to retire. Settled back in Cambridge he was appointed a demonstrator in anatomy in the dissecting-room, where the present regius professor of physic was one of his students. After half a lifetime in general practice it was natural that he should make a point of stressing the applications of anatomy in practice. Patient and painstaking, he took a keen personal interest in the undergraduates, many of whom kept in touch with him long after they had gone down. A colleague, who became his medical adviser, writes: "I can testify to the enormous regard and affection in which he was held by generations of Cambridge medical students between the wars. He was a handsome man, of extraordinary charm and simple modesty of manner. Devoutly religious and unswerving in his principles, he was full of kindly sympathy, and, like his friend, the late Sir Clifford Allbutt, representative of the most courtly tradition in the art of medicine."

As a young man Hopkinson was an all-round athlete, and all his life he was a keen mountaineer. For many years, with his four brothers, he was a member of the Alpine Club. When his climbing days were over, he took an especial interest in the Cambridge Mountaineering Club and a more active one in the University Swimming Club, swimming a mile when he was close on seventy. His family life was a very happy one, despite the loss of a son in the first world war, until the death of his wife ten years ago.

He is survived by two sons and two daughters. The civic tradition of the family has been carried on by his elder daughter, Lady (Lawrence) Bragg, who has lately held office as mayor of Cambridge; and one of his sons is a member of the medical profession.

Births, Marriages, and Deaths

BIRTHS

HERFORD.—On Aug. 6, the wife of Dr. M. E. M. Herford, D.S.O.—a daughter.

MURLEY.—On Aug. 12 at Radlett, the wife of Mr. R. S. Murley, M.S., F.R.C.S.—a son.

O'NEILL.—On Aug. 7, in London, the wife of Dr. Desmond O'Neill—a daughter.

PARKER.—On Aug. 5, at Gillingham, the wife of Colonel D. J. P. Parker, I.M.S. retd.—a daughter.

MARRIAGES

GODFREY—GREAVES.—On Aug. 8, at Chislehurst, John Charles Christopher Godfrey to Joan Frances Greaves, L.R.C.P.E.

STEWART—CLICK.—On Aug. 6, in London, Donald Norman Stewart, M.R.C.S., to Jean Muriel Click.

DEATHS

ASHBY.—On Aug. 6, in Leeds, Joe Edward Ashby, M.R.C.S., aged 59.

CRISP.—On Aug. 12, at Cheam, Thomas Crisp, M.D. Edin.

FOSTER.—On Aug. 5, at Danby, John Robert Foster, F.R.C.S.E., aged 81.

LAIDLAW.—On Aug. 9, at Cambridge, Janet Young Laidlaw, M.B. Lond., aged 66.

LEGGAT.—On Aug. 8, at Wellington, N.Z., Alexander Gordon Leggat, D.S.O., M.B. Glasg., D.P.H., of Newbury.

NEWFIELD.—On Aug. 13, at Gt. Bardfield, Maurice Newfield, M.R.C.S., aged 55.

WHITE.—On Aug. 4, in Guernsey, Digby Cooke White, M.D. Dubl., aged 81.

WHITELAW.—On Aug. 14, at Bathampton, Bath, James Charles Graham Whitelaw, M.A., M.B. Camb., aged 43.

WILLS.—On July 30, in Bath, James Tremlett Wills, M.B. Camb., aged 78.

Notes and News

MORE APPROVED NAMES FOR DRUGS

THE British Pharmacopœia Commission has issued the following supplementary list of approved names:

Approved names	*Other names*
Isoprenaline	Isopropylnoradrenaline. Aludrine. Neo-Epinine. Neo-adrenal. Neodrenal.
Menadoxime	Ammonium salt of 2-methyl-1 : 4-naphthaquinone-4-oxime *o*-carboxymethyl ether. Kapilon Soluble.
Mephenesin	1 : 2-dihydroxy-3-(2′-methylphenoxy) propane. Myanesin.
Mepyramine maleate	*N′*-*p*-methoxybenzyl-*N′*-dimethyl aminoethyl-2-aminopyridine hydrogen maleate. Anthisan.
Promethazine	*N*-(2′-dimethylamine-*n*-propyl) phenthiazine hydrochloride. Phenergan.
Phenadoxone	6-morpholino-4 : 4-diphenylheptan-3-one hydrochloride. Heptalgin.
Decamethonium iodide	Decamethylene-1 : 10-bistrimethylammonium di-iodide. C 10.
Hexamethonium iodide	Hexamethylene-1 : 6-bistrimethylammonium di-iodide. C 6.
Pentamethonium iodide	Pentamethylene-1 : 5-bistrimethylammonium di-iodide. C 5.

ADRENOCORTICOTROPHIC HORMONE IN ARTHRITIS

ACCORDING to British United Press, a "new hormone," developed from hog's pituitary glands by Messrs. Armour & Co., of Chicago, has had remarkably successful preliminary effects in arthritis, rheumatic fever, and gout. Dr. John Mote, medical director of the company, who is quoted as the source of this report, adds that supplies are limited. The hormone referred to is presumably an adrenocorticotrophic hormone (A.C.T.H.). As stated in our leading article of July 23, a hormone of this type, used at the Mayo Clinic, gave results comparable with those of 'Cortisone' (compound E), though the side-effects seemed to be more troublesome.

CHILDREN ON THE ROADS

AT a crossing in Western Avenue, Perivale, there have been 5 fatal accidents since 1947.[1] After a fatal accident there in March, the Ealing Town Council suggested to the Ministry of Transport that a footbridge two hundred yards away should be moved to this dangerous crossing; but no action followed, and a child of ten was killed there last week.

The toll of life taken at such danger spots can be considerable, and is of course exceeded by the number of non-fatal casualties. At a conference [2] arranged by the Pedestrians' Association in May, Subdivisional Inspector Anderson mentioned a junction in Southwark, where 8 children under fourteen had been injured in six months. The layout and traffic signals were inspected, Scotland Yard and the local police went into the facts, parents were interviewed—and in the following six months there was only one slight accident. Scotland Yard keeps a map to identify black spots, and measures are taken to reduce their dangers. A large part of the police force, he said, is immobilised daily seeing school-children across roads; and the police give talks and demonstrations at the schools. Nevertheless, 4500 people were killed and 150,000 injured on the roads last year; and four years of peace have brought 600,000 road casualties. It seems that it is not always easy to get safety devices set up. According to the *Quarterly News Letter* (July, 1949) of the association, when the Lambeth Road Safety Committee asked for a refuge at a point where several people had been injured, sanction was refused by the Ministry of Transport on grounds of economy; and a plan to install five new sets of traffic-lights at Stockport, to ease the traffic problem, has also been turned down.

Most speakers at the conference considered that the child under five is the responsibility of his mother; he should not be allowed out alone in the street, and the mother should be
more aware of him when she takes him out shoppi
suggested that old-fashioned reins for little childre
come back. In some parts of London "play str
recently been set aside for children, through
traffic which has business in the street is allowe
But there are dangers in the system: motorists
sufficiently aware of the sign to avoid the turni
children are not on their guard. Again, a lorry n
at a warehouse in the street, and the driver m
without being aware of small children clinging
back or playing with the wheels. Several accid
kind were described; in one case the driver, before
had walked twice round his lorry shooing awa
but even so he had failed to notice a small child l
front and back wheels.

Among devices to draw children away from
the junk playground received high commenda
untidy roomy playground where they can build
things appeals to most children. Some of our r
sites, used for this purpose, might not only sav
attract some children from pursuits that end in d

RESEARCH IN OLD PEOPLE'S WELFA

FOR over a year a small group of people doing
in their local old people's welfare associations
London have been meeting to discuss points
interest. They have found many subjects whic
with closer study, and they are convinced that
group could profitably examine these issues and o
time will bring to light. They are therefore
those interested to join with them to form a Rese
(Old People's Welfare). The aims will be to cre
for the discussion of modern views on old peopl
to study special problems affecting the aged, t
a national programme of social reform based on
of these studies, and to provide information se
Ronald Gardner, the honorary secretary, will answ
sent to him at 195, Clarence Gate Gardens, Lond

A report on the work of the group indicates t
already being studied. They believe we must
old people to stay at work longer, learn new jobs, a
their output; but it would be cruel, they suggest,
old people to this programme under existing
Studies of the process of ageing might teach u
its rate and mitigate its effects, so that the el
maintain their health and work without physic
Meanwhile the group hope to establish an e
service to retrain the elderly for appropriate an
jobs. They note that many old people living al
kept fit if their minor ailments are treated earl
linking up old people's welfare organisations with l
of doctors they have ensured that the old peo
doctor early and are visited regularly after disc
hospital and during convalescence. They find
old people living on upper floors of houses or
may not receive their full coal ration, and may
of their rights or physically unable to attend th
to insist on them. They may also have nowhe
coal; and, since they often depend on it for cook
as warmth, deprivation is likely to affect their h
group have arranged an emergency distribution
which the local authorities take part, and have n
links between the fuel overseer and the O.P.W. or

They are also interested in the design, deco
equipment of old people's clubs, and are particula
that heating and lighting equipment should be
improve comfort and prevent accidents. Sev
subjects are under consideration, notably the p
care for the feet, proposals to provide a chea
service, and plans for better publicity about sup
pensions and for the aftercare of old people
from mental homes. They are clearly a keen
minded group, who will readily attract like spirits.

N.H.S. DISPENSING

IN answer to a statement in a Sunday news
nearly one bottle of medicine in four prescribed
National Health Service is wrongly dispensed b
taking part in the service, the Minister of Health is
the following results of the test analyses of dis
drugs and dressings under the service which were
on April 1, 1949. During the quarter ended Jun

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[1] Reported in the [illegible] 10.

[2] Safety of Young [illegible] Westminster Conference, 1949. 98, Gower Street, London, W.C.1.

were tested throughout England and Wales. Of
results of 748 were not known by June 30. Of the
; 1005 cases, no action was found necessary in
just over 90%. The other 96 cases—i.e., just under
re referred to the appropriate committee of the
council to consider whether there were any grounds
linary action against the chemist. It is still too
say in what proportion of cases such action will be
ipon, but under National Health Insurance a similar
as in force, and for the year 1932, for which results
ly available, out of 389 cases referred to the appro-
ommittee of the insurance committee, only 227
in disciplinary action. A considerable proportion
mples tested are drugs and dressings bought by the
ready-made and not compounded in his premises.
under the National Health Insurance Scheme, in
% of cases disciplinary action was found necessary;
ok the form either of a warning or of the with-
of part of the chemist's remuneration.

OPHTHALMOLOGISTS GO ABROAD

G the summer the Faculty of Ophthalmologists
ged visits to both Italy and Scandinavia.
y a party of 19, led by Mr. R. J. Buxton, travelled
, where Professor Bietti gave talks and demonstra-
d performed operations, including a keratoplasty
clocilodialysis (for the lowering of tension in certain
glaucoma). At Genoa they were shown round by
r Maggiore, seeing a number of new instruments and
experiments in colour-vision. In this and other
here seemed to be plenty of assistants and rooms
for such experiments. At Florence the clinic of
r Alajmo was visited, and the party watched a
of operations, including sclerectomy for glaucoma.
e Professor Cavara demonstrated the extracapsular
n for cataract, which he finds as satisfactory as the
sular and safer. Professor Leonardi in another hos-
monstrated cataract extraction by suction apparatus.
es Professor Lo Cascio performed nine cataract extrac-
45 minutes; he too had given up the intracapsular
for the extracapsular. He showed the operation
chment of the retina, using surface diathermy with
al needle-punctures. Finally at Bologna, in Professor
zio's clinic, papers were read on pituitary tumours
al infection in eye diseases.

g the Scandinavian tour, in June, under the leader-
Mr. W. Muirhead, a party of 20 was received by the
of the ophthalmic clinics at Copenhagen, Lund,
, Stockholm, Oslo, and Göteborg. Lectures, clinical
trations, and operative sessions were arranged, and the
were made welcome in the homes of their Scandinavian

TRAINING ASSISTANTS IN SCOTLAND

Department of Health for Scotland will shortly ask
medical practitioners who desire to undertake the
of assistants in their practices, and claim special
ts on this account, to apply for recognition as trainer-
oners. Recognition will be given by regional selection
tees appointed by the Secretary of State in consul-
vith the representative organisation of the profession.
itioner who has been recognised will himself engage
stant, and will claim a training grant from his local
ve council. The grant will comprise:

training fee for the practitioner himself at the rate of
ear;

coupment (up to a maximum of £700 per annum) of the
aid by the practitioner to the assistant; and

necessary, an allowance for a motor-car for the assistant.

ant will be payable only where a practitioner under-
he training in general medical practice of a recently
d doctor, and no increase in the number of patients
practitioner's list will be permissible on account of
gagement of the assistant. These arrangements do
ly to the employment of an assistant, whether experi-
r inexperienced, in a practice under ordinary conditions.
nt will be payable in such a case, and the practitioner
ed will not require to be recognised by the regional
n committee. Applications for recognition will be
o the regional medical officers of the Department of
for Scotland, at Edinburgh, Glasgow, Dundee, Aber-
nd Inverness, who will act as secretaries to the various
l selection committees.

DISTRIBUTION OF GENERAL PRACTITIONERS

THE following amendments have been made to the Medical Practices Committee's classification of executive-council areas described in our issue of July 30 (p. 211). Schedule 1 contains the names of parts where more doctors are needed; Schedule 4 of the "closed areas."

Schedule 1

ADDITIONS

Essex.—Barking, Chelmsford with Great Baddow, Chingford, Dagenham, Dovercourt and Harwich, Dunmow, Grays, Hornchurch with Harold Wood and Upminster, Laindon, Purfleet, Rainham, Rayleigh, Romford and Gidea Park, Seven Kings, Tilbury, Walthamstow, Wickford and Pitsea, Writtle.

DELETION

Soke of Peterborough.—Whittlesey and Market Deeping.

Schedule 4

ADDITIONS

Devon and Exeter.—Combe Martin.

Essex.—Earls Colne, Great Bentley, Hockley, Hatfield Broad Oak, Ingatestone and Stock, Roydon, Southminster, Thaxted, Tillingham, West Mersea.

Warwickshire.—Alcester R.D.

OPINIONS OF THE SERVICE

A SURVEY by Mass-Observation, the results of which are published in *News Review* (July 28), confirms the public's generally favourable attitude to the National Health Service. Three-quarters of the people questioned had made use of the service during its first year: 49% had used N.H.S. doctors, 42% dentists, and 17% oculists. Criticism was voiced mostly by the middle classes. Three-fifths of all those questioned who have had experience of the service feel that its introduction has benefited them; about a quarter say that it has hindered or inconvenienced them; while 1 in 6 reports that it makes no difference. People under 40 are more favourable than the more elderly. The commonest reason for praising the service, mentioned by 1 person in 3, is that it saves money. The major criticism is of the slowness and waiting now involved. "Although opinions on the wisdom of the Health Service differ considerably, there is almost complete unanimity that the attention given to patients has not suffered in any way. . . . Many still seem 'mildly surprised' by the excellence of the treatment." The doctor's attention to maternity cases and to children's ailments is usually the most highly praised. A small minority tell of ill-treatment or lack of interest. Very few, however, have found any difference in their relationship with their doctor. "Complaints of a deterioration in attitude are few, and where they occur, are usually accompanied, not by criticism of the Health Service, but by criticism of the doctor whose humanity is governed by his pocket." There is less unanimity about hospital treatment; but on the whole patients are satisfied.

Royal College of Obstetricians and Gynæcologists

The Queen has accepted the honorary fellowship of the college, of which she is the patron, and she will attend the college in the autumn to be formally admitted. Her Majesty has sent a donation of £1000 to the appeal which is being made by the college for funds to meet the financial demands of its ever-widening activities.

Faculty of Radiologists

The following officers have been appointed for 1949–50: president, Prof. B. W. Windeyer; vice-presidents, Dr. J. L. A. Grout and Dr. J. R. Nuttall; warden of the fellowship, Dr. S. Cochrane Shanks; editor, Dr. Peter Kerley; treasurer, Dr. J. W. McLaren; secretary, Dr. E. Rohan Williams.

Welsh National School of Medicine

Dr. W. F. Anderson has been appointed senior assistant in the medical unit of the Welsh National School of Medicine. Dr. Anderson is at present lecturer in materia medica and therapeutics in the University of Glasgow and assistant physician at Stobhill Hospital, Glasgow.

Institute of Neurology, London

Prof. J. Lawrence Pool will give a lecture on Topectomy; Cortical Ablation for Treatment of Mental Illness on Friday, Aug. 26 at 5 P.M. at the National Hospital, Queen Square (Institute of Neurology), W.C.1.

General Medical Council

An election of one member of the council to represent medical practitioners resident in England will be held in November.

Conference on Infertility

The Family Planning Association will hold their annual conference on this subject at Edinburgh on Sept. 17 and 18.

L'Union Internationale contre le Péril Vénérien

The 26th general assembly of this organisation is to be held in Rome from Sept. 12 to 16.

Industrial Nursing Service

The Royal College of Nursing is holding a conference on this subject at the college, Cavendish Square, London, W.1, on Oct. 7 and 8. Tickets may be had from the conference secretary.

Introduction to Social Psychiatry

The Social Psychotherapy Centre, London, is arranging a course of ten lectures on this subject to begin on Oct. 12. Further information will be found in our advertisement columns.

Association of Army Psychiatrists

The 7th reunion of Army psychiatrists will take place at Slater's Restaurant, 18, High Street Kensington, London, W.8, on Saturday, Sept. 24 at 7.30 P.M. Particulars may be had from Dr. J. C. Penton, the Old Farm House, 1, Gatehill Road, Northwood, Middlesex.

No. 2 General Hospital

The third reunion dinner of this hospital will be held on Saturday, Oct. 8, at 6.30 for 7.15 P.M. at Simpsons-in-the-Strand, with Colonel E. Scott in the chair. Tickets (14*s.*) may be had from Mr. A. E. Porritt, F.R.C.S., 10, Upper Wimpole Street, London, W.1.

Electronics Symposium, 1949

The Scientific Instrument Manufacturers Association hold their symposium this year at Examination Hall, Queen Square, London, W.C.1, from Nov. 2 to 4. There will also be an exhibition of British scientific and electronic instruments. Tickets may be had from the secretary of the association, 17, Princes Gate, S.W.7.

Paris Course on Renal Disease

An advanced course on medical disorders of the kidney is to be held at the Hôpital Broussais between Oct. 24 and 29, under the direction of Prof. Pasteur Vallery-Radot. Further information may be had from Dr. René Wolfromm, Clinique Médicale Propédeutique, Hôpital Broussais, 96, rue Didot, Paris 14e.

V.D. Study Group to visit U.S.A.

An international group of experts met in Washington on Aug. 15 to begin a three-month study of venereal diseases in the United States. They will present a report at the third session of the W.H.O. expert committee on venereal disease which meets in Washington from Oct. 10 to 20. Dr. Sidney Laird, venereologist for Ipswich, is a member of the group.

London Hospital

A postgraduate course will be held at the hospital from Oct. 26 to 29. Former students who wish to attend should write to Dr. A. E. Clark-Kennedy, the dean of the medical school, as soon as possible. The annual dinner will take place on Thursday, the 27th, at 7.45 P.M., at the Trocadero Restaurant, Piccadilly Circus, W.1, with Sir Eardley Holland in the chair. Tickets (21*s.*) may be had from Dr. R. R. Bomford, 6, Devonshire Place, W.1.

Liverpool Hospital Regional Board

On Aug. 4 the board was informed that the work of assessing the grading of senior medical and dental staff was almost concluded, and that probably by Oct. 1 all senior staff would have received their contracts. The board recorded its appreciation of the coöperation of consultants in connexion with the appointments to various hospital groups.

The senior administrative medical officer was authorised to investigate the possibility of obtaining additional temporary hospital accommodation for use during the winter months.

Empty Bottles

In conjunction with pharmacists the Ministry is launching an appeal to secure the return of medici used for N.H.S. prescriptions. It is estimated th way the public can help to save £800,000 a year o of the service. Hitherto the pharmacist has recei of 2½*d.* for each prescription, to cover the cost of the From Sept. 1 he will receive only 1¼*d.*

N.A.P.T. Colonial Awards

Scholarships offered by the National Associatio Prevention of Tuberculosis to enable colonial d study anti-tuberculosis methods in Great Britain awarded to Dr. R. K. Richardson (Trinidad) an A. W. E. Moreira, Dr. Abbas bin Haji Alias, and Din bin Ahmad (Federation of Malaya). A pri guineas for an essay by a medical officer in the se colonial government, on the Control of Tubercul British Colony, has been awarded to Dr. Vincent (Northern Nigeria).

Medical Auxiliary Workers

Mr. T. C. L. Nicole, of the Ministry of Health, has Mr. J. G. Paterson as *secretary of the eight commit* the chairmanship of Mr. V. Zachary Cope, F.R.C.S. set up by the Minister of Health and the Secretar for Scotland to review questions of recruitment, t qualifications of medical auxiliary workers in the Health Service. Vacancies on the committees have filled by the following appointments: *Laboratory Te* Prof. L. P. Garrod, F.R.C.P., and Dr. J. E. M *Almoner:* Prof. Clifford Wilson, M.D.

International Scientific Film Congress

The third International Scientific Film Congre held in Brussels from Sept. 30 to Oct. 5. In conjun the congress, there will be a scientific film festival, include four public sessions with films dealing with education, and scientific documentary. There will screening of medical films, when the audience will be to those with medical interests. The Scientific Fil tion of Great Britain is considering the films to be *as the British entry in the festival.* While the asso knowledge of most of the major films, it would information about privately produced films whi be suitable for inclusion. Full details should be s office of the association at 4, Great Russell Street W.C.1.

Second International Conference on Audiolog

Prof. Gunnar Holmgren (Sweden) presided conference which met in London on July 15 and 1 first day papers were read by Prof. Maurice Sourdill Dr. E. P. Fowler, jun. (U.S.A.), Prof. E. Luscher land), and Dr. Harvey Fletcher (U.S.A.). On the s Sir Wilson Jameson opened a symposium on the audiology carried out in England by the Ministry the Medical Research Council, and others. Other included Dr. C. S. Hallpike, Medical Research Dr. W. G. Radley, G.P.O. Research Station; Dadson, National Physical Laboratory; Dr. T. Department of Education of the Deaf, Manchester U Mr. Michael Reed, Ministry of Health; Dr. J. E. A. U Ministry of Education; Miss Edith Whetnall, Roya Throat, Nose, and Ear Hospital; Mr. R. Scott Metropolitan Ear, Nose, and Throat Hospital; Wilkins, the Social Survey; and Mr. Terence C Medical Research Council. In addition, there was stration of 'Medresco' hearing-aids and the Mi Health pattern pure tone audiometer. Dr. Eelco (Holland) is retiring from the secretaryship and is to be taken by Mr. Terence Cawthorne (England).

Appointments

CASSON, F. R. C., M.B. Lond., D.P.M.: clinical assistan
psychological medicine, Charing Cross Hospital, Lon
YUDKIN, SIMON, M.B. Lond., M.R.C.P., D.C.H.: pæ
Canadian Red Cross Memorial Hospital, Taplow.
GLASGOW VICTORIA HOSPITAL GROUP:
MCEWEN, W. G., M.B. Glasg., D.A.: non-resident anæsth
WISHART, H. Y., M.B. Glasg., D.A.: non-resident anæsth

'PORTUNITY FOR ADVENTURE*

F. A. E. CREW
, M.D., D.Sc., Ph.D. Edin., F.R.C.P.E., F.R.S.
SSOR OF PUBLIC HEALTH IN THE UNIVERSITY OF EDINBURGH

ou who have so recently been admitted to the owship of the profession of Medicine this must e the day of all days. It is highly improbable will ever encounter another that includes within span so great an abundance of that all-pervading iluted joy which comes only from the successful nent of the manifestly impossible.

ignificance of the ritual of this ceremony will not caped you. You will be aware of the dramatic rphosis that overtook you when the magic cap y touched your head. You now stand in relation ndergraduate that you were as does the infant unborn. The umbilical cord which formerly you to your alma mater has been cut and you ntered a larger world, to the conditions and tances of which you will be called upon, largely , to adjust yourself. The only bond which now you to your university is the emotional. Now ur undergraduate years are ended, you may begin to enjoy them.

THE TEACHER TESTED

have been vigorously tested and have been found . Now that your examinations are finished that teachers is about to begin. How we shall fare decided not by the extent and variety of our al knowledge and skill—vast as these are in certain es—nor yet by yours, but rather by the quality nward graces that you have cultivated and which present lie hidden beneath the gowns with which e draped, by the kind of culture and character you, whom we have taught, display when you eparted hence and have claimed your various n the open society which you will serve.

to be regretted that with these particular attributes s we are but little acquainted ; with their development e have unfortunately not been greatly concerned. ow so very little of you and you of us. There are easons for this. You are so many, we so few. f us are separated from you by a gulf that cannot ged ; for we belong to a generation that enjoyed, members, and clings to the world before the wars ife was gracious and hope unshackled. We are ly adjusted to the tortured world which we have thed to you and which is the only one known to you. are separated also because so many of you, ntly enchained by your ingrained respect for ity, have remained or have become semi-articulate company, your urgent thoughts being enmeshed inadequate vocabulary. Now that you have d from our dominion it is imperative that you at once begin to repair this grave deficiency. ossess the power of speech, the spring of man's ctual progress. But there is no profit in this sion unless it is transmitted into the ability to se. At all times you will require words, and the words in the right order, for conceptual thinking than for the expression of feeling.

have certainly offered you instruction without You are now qualified—qualified to depend for rofessional opinions and judgments upon the misreted findings of the laboratory report. You are ghly competent to blunt by misuse any instrument ecision that medical science may place in your . But as we bid you farewell and the best of good fortune, some of us find ourselves wondering whether or not we have done all that we could or should have done to advance your education. Have you, as the result of our intervention in your affairs, become or remained capable of critically observing, of skilfully experimenting, of discriminating between the true and the false ? Have we made you more capable than before of entertaining a new idea, a friend, and, especially, yourself ? Have we by our advocacy and example taught you to loathe intolerance, intellectual dishonesty, and inaccuracy ? Have we in our behaviour persuaded you to avoid malice, bitterness, and envy and to cultivate a constructive discontent concerning not only things in general but also, and especially, yourself ? Have we played a part in the fashioning of your secret ambition ? Have we taught you to seek, not wealth, not security, but the understanding heart ?

If not, then we must crave your pardon. Thus far your immaturity and upbringing and the circumstances of the academic *milieu* have impelled you to respect your teachers. Soon you will be in a position to judge us. We can but hope that in the future, if we have failed you, you may find it possible to forgive us.

This should not be impossible ; for the generation of your teachers has lived in a time of quite exceptional and violent change during which threatening peril corroded every one of the prized products of human achievement. We have been required to assume unusually heavy responsibilities in respect of the sifting and transmitting of ideas and ideals. In the confusion of dreadful war and in the conflict of uneasy peace some of us have failed to formulate any clear philosophy of life or to construct and adhere to any firm standard of values. In a world of flux and insecurity we have remained uncertain, and all too often we have avoided contemplation in busy activity.

It may well be that we in our distress have so instructed you that some of you are no longer capable of educating yourselves. If so, then indeed we have done great harm ; for the practice of medicine is the vocation of an educated person. The little that you know of technical matters will soon become obsolescent, and so unless your education proceeds nothing lies ahead of you save success —success as measured by yardsticks other than those in accord with the ideals of our profession. It is imperative therefore that your general education, so seriously retarded by the crowded content and the furious speed of the medical curriculum, shall now be resumed.

MEDICINE AND PEOPLE

To break a bottle on your bows in this way as you are launched into the sea of professional life is a matter of pleasant simplicity. But to provide you with the charts for your several voyages is indeed difficult, if not impossible, for you are to adventure into unknown waters. The place of Medicine in our society, the social function of Medicine, has latterly become so vastly changed that our experience is not a trustworthy guide.

The theory, content, aims, and function of Medicine in any age or place are reflections of the social theory and the social aims that prevail in that place at that time. Thus, for example, in its beginnings Medicine was a system of propitiative ritual exercised in intervention between puny frightened man and angry awful god. With the passing of time and the changing of man's conception of Nature and of himself, Medicine became one of the means whereby man sought to establish harmony between himself and his external physical world. Today and in this country, the interests of Medicine are becoming focused upon the disharmonies which exist between the biological nature of man on the one hand and, on the other, the social structures and institutions, the political and other creeds, and the economic systems which man has invented. Medicine is rapidly becoming a social science and as such is

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oter's address to new medical graduates of the University Edinburgh on July 20, 1949.

regarded as one of the most potent instruments that a modern society can use in its enterprises in social engineering.

The major objective of Governments in this country in recent times has been and is the creation of the Welfare State. This phrase reveals in the clearest possible manner that the preservation and augmentation of the health, happiness, and efficiency of the people have become a prime preoccupation of good government. The inception of the National Health Service can only mean that Governments have been acting on the warrantable assumption that only by harnessing the willing and wholehearted loyalty of our profession to the ideas and ideals embodied in the project of a Welfare State can this objective be achieved. Medicine is now being employed as an instrument of social policy.

We are required to place at the disposal of the legislature our expert knowledge concerning the nature and variety of human needs in respect of health, happiness, and efficiency, and concerning also the ways in which these needs may be satisfied by adequate social and political action, in order that in increasing measure legislation may implement recommendations derived from and based upon medical knowledge. We, and especially you, are invited to be the architects of a new world fit for *Homo biologicus* to live in.

Very shortly you will become entangled in disputation concerning this health service as it now is. You will be invited to be offended by the peculiar behaviour of flamboyant personalities, seemingly intoxicated by the fumes of their own rhetoric. You will be encouraged to assess the value of this scheme by the extent of the financial disadvantages it confers upon you. If you are wise you will reserve judgment and give your attention to the ways in which this service, being improved, can provide the optimum conditions in which the practitioner of medicine can do the greatest good. Be critical of the exaggeration that is characteristic of the partisan. Be critical also of the unwillingness of older generations to endure that disturbance which change involves. The service is by no means perfect, far from it—the hopes and intentions of the visionary are always more magnificent than are the realities that emerge therefrom—but it is not a dismal failure. It is merely unfinished, and displays the deficiencies of the incomplete and still evolving. The important fact is that the general conception of a national health scheme claims the support of the majority of the people and of our profession. That this is so indicates that we as a people are far advanced in our social evolution. What is asked of you is that you should help repair the imperfections and deficiencies in the interests of the people as a whole, and in so doing assist in the evolutionary development of your chosen profession. The scheme will certainly fail unless, entering it, your spiritual equipment is at least the equal of your technical armamentarium.

RIGHTS, NEEDS, AND DANGERS

The intellectual atmosphere of this country is changing fast. Humanity is eagerly groping towards an ever-expanding dignity. Human rights and human needs are beginning to overtop all else in governmental considerations. A planned economy, careful of individual liberty, is taking shape.

It is for reasons such as these that so much of politics is medical knowledge applied to the affairs of a human population. No previous generation of medical graduates has ever been presented with such opportunities for high adventure, for full self-expression in dedicated service to mankind.

Ahead of you lurks danger—danger that derives from the very vastness of the machinery for the employment of Medicine, and danger that the intense specialisation within Medicine creates. Large-scale organisation is
in this age unavoidable; it has become
condition of human survival. But suc
organisation inevitably brings in its train t
overriding bureaucratic authority. Since
is so rife within Medicine it follows that for
of our opinions and judgments we have to
authoritative statements of others. You w
become involved in the everlasting conflict
rival claims of authority and intellectu
For these reasons also it becomes imperati
education shall proceed and that to your kn
shall add wisdom.

You are now consecrated to Medicine an
us the great and ancient tradition by which
science have become inextricably interwov
moral ideals. You are now willingly bo
Hippocratic Oath and by it you have dedicat
to a life overflowing with beneficence and fi
promise of intellectual and emotional satisf
have joined the elect and the highly favo
records of human accomplishments testif
no other activity, save perhaps from that
of religion and morals, has mankind rece
good than from the ministrations of Me
have a far greater chance of achieving nobilit
than the majority of your fellow men, for a
well-doing moulds the nature of the person
You will thus enjoy great privilege. Bew
abuse it.

We send you forth with our blessing, pla
care the reputation of this school. You m
content merely to preserve that reputatio
be your aim and your pleasure to advance it.

THE SEVEN SINS OF MEDI

Richard Asher
M.D. Lond., M.R.C.P.
PHYSICIAN, CENTRAL MIDDLESEX HOSPI

There is an unlimited number of medica
am going to catalogue and comment on se
in the hope that those students who wish to
may do so and those who wish to indulge i
enlarge their repertoire or refine their tech
seven sins are obscurity, cruelty, bad ma
specialisation, love of the rare, stupidity, a

OBSCURITY

Both in writing and in lecturing clear sty
words are best. Obscurity is bad, not only
difficult to understand but also because it
with profundity, just as a shallow muddy p
deep. Here is an example from a recent
writers wanted to say: "We judge men'
their working-places and their homes," but th
their meaning in this sentence: "It is genera
that the evaluation of the nutritional statu
munity should include assessments of the en
conditions under which individual membe
work." As Mr. Ivor Brown[1] has pointe
writing produces a slow weak ooze of words
keen forceful jet. The double negative is
way of making a simple statement harder to
and if we read "It is by no means far from
that the absence of tubercle bacilli is not
detected," few of us can say whether tubercl
present or not (nor do we care).

I warn students taking histories against
simple English of their patients into the jar
textbooks. If a patient says "if I go half-w
I feel I'm done for," these very words shoul

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* A lecture given to the University College Hospital M
on March 17, 1948.

[1] Just Another Word. London, 1943.

es rather than "The patient complains that
ambulation up a moderate incline he suffers a
f impending dissolution."

CRUELTY

y is probably the most important and prevalent
the list I have chosen. Usually it is due to
lessness and not deliberate. *Mental cruelty* is
r and arises in three ways: (1) by saying too
(2) by saying too little; and (3) by the patient
rgotten. By saying too much we often burden
t with a load of anxiety which adds to the illness
trying to relieve. Many times I have seen
who felt well till they were told they had high
ressure or a heart murmur, and since that time
en afflicted with every grievous symptom which
e gathered from hearsay, from patent medicine
ements, and from "The Home Doctor." Before
patient anything of his illness it is essential to
whether it will help him or harm him, and with
practice one soon learns what it is wise to say.
aying too little one can cause the fear of the
n; the gaps may be filled in by the patient with
g inventions and superstitions. That is why
planation should be given to the patient who is
ed from hospital, both so that some of his
ess fears are removed and so that if he gets
he care of another doctor he can give a moderately
e account of what he has had. The doctor
know what fears and superstitions are common
patients so that he may allay them and prevent
cruelty. For example, a patient with shingles
rly always been told by his grandmother that
y meet in the middle you die," and the assurance
ither will they meet nor will he die may give
uch relief. Patients with mild arthritis are
terrified of becoming "crippled with rheu-
," and similarly many patients with bronchitis
uberculosis; in these cases reassurance is more
nt than medicine, and it is the doctor's duty to
these fears if possible.
y, forgetting the patient. I refer to that kind of
teaching and discussion where the patient is
as if he were unconscious, or discussed as if he
lay on the necropsy slab. It must be remem-
that patients have ears, and that sotto-voce
rings about polysyllabic diseases strike needless
nto their hearts.

l Cruelty

-investigation is a form of physical cruelty. If a
dying of secondary cancer and the primary cancer
n be discovered at necropsy, it is cruel to make
days uncomfortable by playing at "hunt the
" as one might play "hunt the slipper," and it
xtra work to the radiologists and pathologists.
s dying of heart-failure are happier without
catheters, arterial punctures, and other tests
of those who judge a patient with heart-failure
cardiac output in litres per minute rather than
number of stairs he can climb.
are some minor cruelties which can easily be
. Do not give mersalyl in the evening, so keeping
ient awake passing urine all night. Do not do a
al test-meal on a patient with pernicious anæmia
e is admitted with a hæmoglobin in the twenties;
s hæmoglobin up with liver treatment first—his
ydria will keep. Do not play at "pushing the
sonian"; there are enough signs of parkinsonism
nose a case without pushing him in the back to
w far he totters forward. Do not put sticking
on hairy limbs; you can easily shave them first.
t wheel elaborate trolleys to a patient's bedside
art sticking needles in him until you have given
word of reassurance and explanation.

BAD MANNERS

If students do not learn good manners while they are learning medicine they will be at a great disadvantage in dealing with patients, nurses, and colleagues.

Towards Patients.—I once asked a student to examine the abdomen of a patient lying in an outpatient cubicle. He dashed into the cubicle where she lay, flung back the blanket, plumped his hand on her abdomen, shouted "Gosh, what a beauty" (he was referring to the patient's enlarged spleen and not to her personal appearance), and dashed out again. Such behaviour must be condemned.

Other forms of bad manners are (1) impatience in taking a history from a slow-witted patient; (2) making jokes at the expense of the patient; and (3) reading the patient's newspaper which lies on his bed and displays headlines far more exciting than the story the patient is telling.

Towards Nurses,—Students will find that a courteous good morning to the sisters makes their access to patients and to ward equipment much easier. (In America the remark "Good morning, sister," is equivalent to saying "How goes it, honey?" and should be avoided.) Too many students or house-men call for a nurse in the manner of an impatient diner calling for a waiter.

Towards Medical Staff.—Years ago a student would take his hands out of his pockets even if a registrar passed him, and almost grovel at the sight of a chief. Perhaps the senior staff had too much majesty and pomp in those days, but the pendulum has swung in the other direction today. At any rate, I advise students not to examine an abdomen with one hand in the pocket, because it is an inefficient way of palpating; it will irritate physicians and give a bad impression in the examination hall. In general, students should aim at a reasonable respect for their seniors but avoid an oily deference. I further caution them against bad manners when they become more senior, and suggest such courtesies as asking their colleagues' permission before seeing a case in their wards, and writing and congratulating them on their publications or appointments.

OVER-SPECIALISATION

It is right that a doctor should have special interest and knowledge about one subject. It is wrong for him to show special indifference and ignorance about all other subjects. A good doctor should be a jack-of-all-trades and master of one. For example, a surgeon should be able to advise a patient with simple obesity about her diet and not refer her to an endocrine clinic; a gynæcologist should be capable of treating a mild iron-deficiency anæmia without referring her to an anæmia clinic; and a physician ought to squash a small ganglion on the back of the hand with his thumbs (or bible). I have known an eye surgeon after seeing a case of retinitis pigmentosa write in the notes: "This might be part of the Laurence-Moon-Biedl syndrome; is there any evidence of polydactyly?" For an ophthalmologist to feel himself incapable of counting fingers is surely the limit of over-specialisation; and, if nothing is done to stop this tendency, we shall have one physician who specialises in the first heart sound, and the other who is only concerned with the second.

Perhaps the worst feature of specialisation is that it makes doctors feel they are doing wrong to deal with even the simplest case if it lies within the protected area of somebody else's specialty. Particularly is this the case with psychiatry, which is regarded by other doctors with a mixture of suspicion, reverence, and ridicule. In Noel Coward's "Blithe Spirit" a character, referring to psychotherapy, says: "I refuse to go through months of expensive humiliation in order to find that at the age of ten I was desperately in love with my rocking-horse." A surgeon or a physician faced with a patient exhibiting some "functional" symptoms is likely to take a similar attitude, feeling that the origin of the simplest psychoneurotic symptoms lies buried in an uncharted swamp in which only the expert can poke with impunity—a swamp crawling with complexes and repressions, where nothing is what it seems and everything symbolises something indecent. This is a foolish attitude to take; a sensible physician or surgeon should be able to give wise counsel in the simpler case of neurosis.

Further, there is a complication of specialisation—that it allows bees to remain undisturbed within their masters' bonnets so that the allergist looks at the world through allergic-coloured glasses and beams myopically at a world where everything is allergic.

LOVE OF THE RARE (SPANOPHILIA)

This sin is more prevalent among students, because they lack the experience that teaches which illnesses are common and which are rare. It is responsible for the failure of bookworms to pass exams. Headache and vomiting are more often due to migraine than to cerebral tumour; nose-bleeding is more often due to picking the nose than to multiple hereditary hæmorrhagic telangiectasis; and wasting of the small muscles of the hand occurs in old age and rheumatoid arthritis more often than in motor-neurone disease or cervical rib.

COMMON STUPIDITY

By this I mean the opposite of common sense—common nonsense in fact. There are many kinds of this particular sin, but I think the commonest type is what might be called therapeutic automatism. No illness has a rigid code of treatment which must be advised in all circumstances; one must cut one's therapeutic coat according to the mental and economic cloth of one's patient. It is mere foolishness to order an elaborate diet for a busy working-class woman with instructions to add on the fourth day $1^3/_4$ oz. of steamed red mullet to the graduated scheme prescribed. I saw the finest example of therapeutic automatism as a medical student when I was skating one winter on the local squire's pond, watching all the quality displaying their skill. A woman fell and broke her tibia. I longed to treat her, but I was only a student. "She mustn't be moved till the doctor comes; we must treat her for shock," cried all the bystanders. From within the squire's house maids hurried out with hot-water bottles, while sympathetic ladies lent their furs. Musquash was piled upon sealskin, and nutria lay upon mink. The stricken woman groaned beneath this furry mound. "The treatment of shock is always warmth" repeated the ladies (who had taken their red-cross course), but I had learned physics during my 1st M.B. and felt that another factor was at work: "Warmth may be good for shock," I thought, "but it also melts ice." It was only at the last moment that these zealous first-aiders were persuaded to abandon their treatment and drag the lady off the ice; otherwise the patient, together with a valuable collection of furs, might have been lost. I mention this to show that patients should never be treated by rote and rule, for there may be special circumstances.

SLOTH

Medical sloth can be physical or mental. Physical sloth exists more than we like to admit. When blood-banks and standard apparatus made transfusion quick and easy, the number of transfusions quadrupled in a few years, which makes it regrettably apparent that the easiness of treatment rather than its urgency may decide whether or not it is given.

Physical Sloth

This often causes the omission of blood-pressure estimations, ophthalmoscopy, or rectal examination, and leads to lapses in aseptic ritual (if a lumbar-puncture needle touches the bed-clothes, it is tempting to pretend not to notice it). Physical sloth may also overworked nurse who, tired of counting adds one more twenty to the row of twenties the chart, and this may stretch the doctor's belief greatly.

Mental Sloth

This is commoner and more important. E history-taking is sloth the great danger. If hot, the patient deaf, the doctor in a hurr history garnished with reminiscences and irre requires enormous patience and concentratio the essence from it. One form of unconscio worth special mention. Do not accept th diagnosis when taking a history—find out his Rheumatic fever at the age of 10 years is imp the patient's statement that he had it needs am He may have been one day in bed with a p ankle which his aunt said was rheumatic feve other hand, may have been twelve weeks i flitting joint pains of great severity starting a throat. Similarly with diet (so important a history in cases of anæmia), do not write " or "fair," but find out what exactly your p at each meal, and you will be astonished women are living on bread and margarine an cups of tea.

Lastly, beware of sloth in thinking. If y lazy to think for yourselves, you will fall an e the less thoughtful papers and publicatio accepting the myth and mumpsimus against Forbes[2] has so ably warned us. If you healthy doubt (without being unduly sceptica have the experience of the Queen of the *Iolanthe*:

"On fire that glows
With heat intense
I turn the hose
Of common sense
And out it goes
At small expense."

Please adopt this attitude with everything I and realise that much of it may be nonsense

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CONTRIBUTION OF THE EMPLO HISTORY TO CLINICAL DIAGN

A. MEIKLEJOHN
M.D. Glasg., D.P.H.
SOMETIME MEMBER OF THE MEDICAL BOARD FOR
AND ASBESTOSIS

> "'When you come to a patient's house, yo him what sort of pains he has, what caused many days he has been ill, whether the bowels and what sort of food he eats.' So says Hippo work *Affections*. I may venture to add one tion: what occupation does he follow?"—
> RAMAZZINI (1700) (trans. W. C. Wright, 1940).

The influence of occupation on health, someti ing in specific diseases of tradesmen, is established and recognised in our common such expressions as painters' colic, potters' r lung, boilermakers' deafness, hatters' sh weavers' cough. Accordingly, the occupatio (or, better, the employment history) is of c importance in clinical practice. But of a wo not sufficient to inquire "what occupatio follow," for, as observed by Bramwell and K "to take an adequate history is far more diffic make an adequate physical examination . . . . considerable clinical experience to elicit and t its true value all the evidence which can b from interrogating the patient."

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[2] Forbes, J. R. *Lancet*, 1946, ii, 293.

azzini's suggestion, shrewd as it is, marks only a advance, because it fails to emphasise that the from which a workman may suffer does not arily reflect his present occupation, but rather previous occupation or indeed bad conditions or formerly prevailing in the same employment e 1935). So the recording of the occupational y involves a definite technique which should be ed at the first consultation and should not (as so happens) await the direction of evidence subse- y revealed by radiographic, biochemical, blood, tum examination. The history should commence age of leaving school and should itemise the periods ature of employments in chronological order to Each separate employment—and in particular even this may have to be subdivided into periods uld be amplified by reference to the raw materials, ols, the processes, the general environmental con- s, and any protective devices in use. Hours of shifts, meal-hours, wages, and the occurrence of r illness in fellow workmen—all are important. ntally workmen engaged in certain specific risks on their person some intimation of the risk; a ice which might usefully be extended to certain ndustrial diseases. Examples are:

he Worker's Register in Silicosis and Asbestosis.

Form 1893, Ministry of Labour and National Service, to workmen exposed to anthrax infection.

Identity discs worn round neck or wrist by caisson rs.

eason of critical episodes this practice might prove l in cases of diabetes, epilepsy, and renal insufficiency. the overwhelming majority of cases the employ- history will provide no substantial contribution to liagnosis; but it will never fail to assist in the ment and management of the patient, as implied in n to work, rehabilitation, and resettlement. The pline of the practice is invaluable, equalled only by ast phase—attendance at the necropsy. The time culcate and develop the technique is during the e period of clinical instruction in the wards and out- nt departments, and there are few surer and quicker s of gaining a patient's confidence than the display telligent knowledge of his job.

do not propose to elaborate this theme, but rather llustrate it by reference to some interesting fatal s of silicosis.

SILICOSIS IN GRAVEDIGGERS

certain parts of England—Cheshire—and Derbyshire es were and still are prepared in solid sandstone . The excavation is achieved by workmen using umatic hammers and drills; in the narrow cell, icularly in dry weather, the intensity of the dust d is very high and even the use of water does little ontrol it.

hree workmen, employed at a cemetery near Birken- d for 23, 26, and 27 years, died of massive silicosis, ch in two cases was complicated by tuberculosis. eral other cases were diagnosed in life. While these kmen were classified as gravediggers, they were in drillers in silica rock.

TUNNELLERS

uring the war deep shelters were excavated in the crops of sandstone near Birkenhead. The drilling undertaken by casual labourers with no previous osure to a silica risk. Three cases were observed in ich death occurred from massive silicosis, one com- ated by tuberculosis, after $1^{1}/_{2}$–3 years' work. In ry instance the disease did not become apparent ring the course of the employment, but appeared only ile the workman was unemployed or engaged in some harmless labouring. The occupation in each case was recorded as general labourer. Similar cases have occurred, and others may yet appear, among labourers employed in excavating underground petrol reservoirs and ammunition dumps.

SOAP-PACKERS

Scouring powders composed of fine siliceous sand mixed with washing-soda or soap-powder are in daily use for household cleaning. As a rule these are prepared and packed mechanically in modern factories, but occasionally, in the neighbourhood of natural deposits of suitable sand, the work is carried out by hand in tumble-down sheds. Three women aged 18, 24, and 38 years, after 2–5 years' work died of silicosis accompanied by tuberculosis. During life these cases were treated as simple tuberculosis, and only when death occurred was attention focused on the nature of the materials which they had been packing.

BRICKLAYERS

This occupation is usually associated with housing, but many bricklayers are regularly employed in coal-mines, foundries, and potteries. In the last two they are engaged not only in building but in the demolition, repair, and rebuilding of furnace and oven linings. This involves the cutting and fixing of special refractory bricks, 80% silica, in closely confined spaces where dust control is practically impossible and protective helmets and masks intolerable. The silicosis risk is of a very high order, particularly during demolition of old refractory linings. Our necropsy records contain two cases of advanced silicosis, from this cause but several more were identified clinically.

PREPARATION OF COLOURS AND GLAZES

To the industrial toxicologist the work of the colour grinder and mixer and leadhouse worker might suggest poisoning by arsenic, chrome, mercury, lead, or some rare metal; but the possibility of silicosis might easily escape notice if careful investigation were not made into the ingredients and processes. In the preparation of ceramic colours and low-solubility lead glazes (fritted lead; lead silicate), powdered silica is an important constituent, and the workman is exposed to the inhalation of the siliceous dust during mixing and grinding. Moreover, before the introduction of mechanical handling, the work was often carried out under very unsatisfactory conditions. Seven cases of death from silicosis or silicosis accompanied by tuberculosis appear in this series. It may be argued that investigation of the pulmonary disease would have included an X-ray film, whereby the condition would have been recognised. This is only partially true, for in one case sudden death followed coronary-artery occlusion while two others died of acute pneumonia and one was treated as simple tuberculosis.

SAGGAR-MAKERS

Saggars are fireclay boxes in which pottery is "placed" for biscuit firing. The handling and manipulation of fireclay is not considered to involve the risk of silicosis, though this does not preclude the possibility of other forms of pneumoconiosis. Quantities of grog, however, such as broken saggars (crusted with placing sand or flint) or ground earthenware pitchers, are frequently added to the fireclay, thereby exposing the workmen to the inhalation of free silica. In eight necropsies among saggar-makers evidence of silicosis was noted. Over a period of 15 years this may appear insignificant, but it should be remembered that the number of such workmen at risk is very small.

Other unusual cases of silicosis were observed in connexion with crushing poultry grit in which sandstone was added to the limestone, grinding of fireclay slabs on an emery disc grinder, among sanitary fireclay setters who used powdered flint as a parting powder, and among potters' dippers and glost placers. The details of these, however, need not be presented, for enough has been said to suggest the importance of a comprehensive employment history. No doctor can be expected to be familiar with the details of all industries, but every opportunity should be taken to study those within the area of his practice. That is only possible by visits to the factories, mines, and other places of employment.

SUMMARY

The employment history is invaluable and indeed indispensable in clinical practice. It is not sufficient to name the workman's occupation; the recording involves a precise technique which should be impressed on the student throughout his clinical studies.

A number of unusual cases of silicosis in gravediggers, tunnellers, soap-packers, bricklayers, colour mixers and grinders, leadhouse workers, and saggar-makers, is presented by way of illustration.

My thanks are due to Dr. Charles L. Sutherland and the members of the Medical Board for Silicosis and Asbestosis, 1931–46.

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FUNCTION OF THE M.D. DEGREE

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A BACHELOR of medicine of a British university may proceed to the higher degree of doctor of medicine by examination alone, by examination and thesis, or by thesis alone. The candidate is seldom free to choose which of these methods he will adopt; most universities prescribe a single method, usually examination and thesis or thesis only. In recent years there has been considerable criticism of the arrangements for the M.D.; the critics include both examiners and candidates, and between them they represent many universities. Some think that the M.D. by examination duplicates other higher qualifications, such as the M.R.C.P. and D.P.H., and that the M.D. should be obtainable only by thesis; others condemn the M.D. by examination and thesis because it entails a division of energy between study and research; objections have been made to the narrow interpretation of medicine that excludes surgical topics as subjects for theses; the appropriateness of awarding gold medals and other distinctions with the degree has been questioned. These criticisms suggest that the M.D. is imperfectly adapted to current needs and deserve careful study.

REQUIREMENTS FOR THE M.D.

Table I shows that the requirements for the M.D. vary widely from one university to another.

Though London prescribes examination as the normal avenue to the degree, the regulations permit a thesis, which may exempt the candidate from part of the examination, or, in the special case of pathology, from the whole of it. Of the 4 universities requiring the candidate to proceed by thesis, 3 make further stipulations: Cambridge may allow or require an examination, Dublin requires an oral examination on the thesis and on general medicine, and Manchester may require an oral examination on the thesis only. Of the 8 universities requiring examination and thesis, all except Wales may waive the examination. Ireland requires published work if examination *does not form* part of the procedure.

When a thesis forms part or the whole of tl ment, previous approval of the subject is required, and exclusively surgical topics are prohibited; Edinburgh, St. Andrews, and I implication prohibit theses in chemistry, physic and zoology. The range of permitted topics is widest at Manchester, the requirement bein "on some subject coming within the scoj Faculty of Medicine"; this of course allows surgery and also in subjects not taught to unde —for example, medical history—and both su historical theses have in fact been accept universities reserve the right to examine can the subject-matter of their theses, but such an e is rarely required as a routine.

THE M.D. BY EXAMINATION

It could be argued that no doctorate should l merely in recognition of advanced study, and highest academic title should be reserved for have demonstrated their ability to make observations or carry out original research. T be a theoretical argument against the M.D. by tion and would certainly be supported by the the non-medical faculties. Theory and tradit ever, ought not to be allowed to outweigh considerations, and if the M.D. by examinatio useful, or could be made so, it should be contir

The most serious objection to the M.D. by ex is the fact that it is an unsuccessful competito qualifications, such as the M.R.C.P. If the examination were a generally recognised alte the M.R.C.P., it would be unobjectionable—t reason why one type of institution should monopoly of a particular type of qualificatio fact the M.D. by examination and the M.R.C. alternatives. The generally accepted higher tions in clinical medicine are the M.R.C.P. corresponding Scottish and Irish diplomas (incl Glasgow fellowship), and in seeking a higher ap an M.D. in medicine might well be at a dis compared with holders of these diplomas. If in medicine were to be an acceptable alternat various higher medical diplomas, the M.D. r would have to be standardised within narro Similar objections could be made to the M.D. health, a subject in which all practical r adequately met by the D.P.H.

In defence of the M.D. by examination it *argued that its object is not to furnish the* with an officially recognised-certificate but to and reward higher study for its own sake. Tl *is that anyone seeking a higher qualification* i medicine would naturally prefer a certificat

TABLE I—REQUIREMENTS FOR THE M.D.

University	Examination alone	Examination and thesis	Thesis alone	Scope of exa	
				Medicine only	Med. a speci subjec
Aberdeen	..	+	..	+	..
Belfast	+	..	+	..	+
Birmingham	..	+	..	..	..
Bristol	+	..	+	+	..
Cambridge	..	..	+	..	..
Dublin	..	..	+	..	..
Durham	..	+	..	+	..
Edinburgh	..	+	..	+	–
Glasgow	..	+	..	+	..
Ireland	+	+	+	..	+
Leeds	..	+	..	..	+
Liverpool	+	..	+	..	+
London	+	..	..	+	+
Manchester	..	..	+	..	..
Oxford	..	..	+	..	..
Sheffield	+	+	..	..	+
St. Andrews	..	+	..	+	..
Wales	..	+	..	+	..

ut the realm and conveying substantial privi-
second defence would be that the M.D.
ions are of a higher standard than membership
ions. It is probable, though not certain, that
e standard is higher—on this point it would be
g to have the opinions of examiners and
s with experience of both types of examination.
ination for the London M.D. in psychological
is officially stated to be of a "distinctly
standard than the examination for the D.P.M.
courses seem to be open to the universities:
ld convert the M.D. by examination into a
qualification acceptable in lieu of the M.R.C.P.
r higher diplomas, or stiffen the requirements,
altogether from the field of specialist certification
shing examinations as an avenue to the M.D.
nd possibility, that of stiffening the require-
ould imply the recognition of two distinct
postgraduate attainment: a lower, marked by
hip and other diplomas, and a higher—for
es of mature experience—marked by the M.D.
ponding course seems to be favoured by some
in connexion with the parallel problem of the
and the Ch.M. degree. Of the three possibilities,
e least desirable and the case against it must be
t length.

eed of postgraduate examinations in medicine
gery and their various special branches will
e questioned; on the other hand, it is extremely
whether two levels of attainment ought to be
d. Preparation for a membership or fellowship
tion entails the prolongation far into adult life
mature attitude to knowledge. Although the
e is acquiring practical experience in his field
ling widely, his reaction to what he reads is
bly different from that of the laboratory worker
rch student. In the main, the examination
e has greater confidence in the printed word
re respect for authority; he runs the risk of
g a pedlar of other men's opinions, and can
gainst it only by obtaining some first-hand
ce of research. The M.R.C.P. or F.R.C.S. who
such experience may throw off any ill effects of
d study, but the medical laboratory worker has
antage of an earlier start. The standard of
ge represented by the M.R.C.P. and F.R.C.S.
be accepted as sufficient for all practical pur-
examinations of still greater difficulty would
scholasticism that would be against the interests
the candidates and of medical science.

ion of the M.D. by examination would represent
in the withdrawal of the universities from the
technology and would be in line with current
ty policy. In this connexion it is interesting to
the possibility of a further differentiation in
between the universities and the medical cor-
s. The Goodenough Committee[1] thought that
tion with regard to postgraduate medical quali-
was unsatisfactory; they concluded that
s requiring university courses—those in public
clinical pathology, bacteriology, and tropical
—should be awarded only by universities, and
ponsibility for all other postgraduate medical
s should be assumed by the Royal Medical
. The Royal College of Surgeons of England
wn a lively interest in technical qualifications in
branches of surgery (including dental surgery);
other hand, the Royal College of Physicians of
seems to confine its interest to general medicine,
h the membership may be granted on published
Clinical medicine is no less diversified than
surgery, and a case could be made out for granting the M.R.C.P. in special branches of medicine—pædiatrics, for example—as well as in general medicine, as at present. The institution of such alternative routes to the M.R.C.P. would facilitate the abolition of the M.D. by examination and would have two further advantages: by allowing the candidate to concentrate on his future specialty it would enable him to reach a higher standard of knowledge; and it would make possible a special examination for research physicians who at present seem obliged to devote an excessive proportion of their time to preparation for the ordinary M.R.C.P.

THE M.D. BY EXAMINATION AND THESIS

There is even less to be said for the M.D. by examination and thesis than for the M.D. by examination alone. The M.D. by examination alone may at least be equivalent to a recognised diploma; it is doubtful whether as much could be said of the examination part of the M.D. by examination and thesis. The chief objection to this method, however, is the distraction of the candidate from his research in order to prepare for the examination. Candidates for higher qualifications are as a rule heavily engaged in some branch of medical work, and the time and energy that they can give to study or research are limited. The preparation of a thesis is likely to absorb all the candidate's leisure for many months at least and should not be done under the shadow of an examination. Furthermore, the prescribed subject of the examination may have no direct bearing on the candidate's line of professional work; it is unreasonable, for example, to require a medical laboratory worker to stand an examination in clinical medicine. The non-clinician is as fully entitled to proceed to the doctorate in his own faculty as the clinician and should not be made to feel that he really ought to seek it elsewhere.

The present compromise of exempting candidates who produce meritorious theses from examination is unsatisfactory, because the candidates must prepare themselves for a possible examination long before the date on which exemption can be granted. If a thesis does not reach the required standard, the proper course is to withhold the degree. The attainments tested by examination and by thesis are very different, and mediocrity in both tests should not be regarded as equivalent to excellence in one of them.

THE M.D. BY THESIS

The preparation of a thesis is a most valuable form of intellectual training. Even though the scientific results may be of no great importance, the writer of a thesis learns many things that will be useful to him throughout his future career. He learns how to find out what has been written on any subject, how to use the *Index Medicus*, and how to obtain reprints, microfilms, and photostatic copies of articles not available locally. He must grasp the essentials of publications in foreign languages and is probably obliged to grapple with statistical methods to interpret his own findings. Through reading and abstracting a large number of papers he learns to read critically, and in presenting his own results he practises the arts of writing, of tabulating data, and of choosing illustrations. The work itself teaches him how hard it is to observe accurately and acquaints him with the common sources of error. If thesis work is a training in discrimination and criticism, it is no less a moral discipline, for scientific work, like other kinds of exploring, needs a stout heart as well as a clear head; once begun, the task cannot honourably be abandoned and *tenax propositi* must be the candidate's watchword, or, if need be, his epitaph.

Supervision by an experienced worker is highly desirable. Without expert guidance, the novice in research is likely to waste much time and to take many wrong turnings. Help of this kind is perfectly legitimate; candidates working in universities or large hospitals should have no difficulty in finding it locally; others may obtain it from professional tutors. Advice is needed at every stage of the work; the candidate who accepts it gracefully and works conscientiously will be a better doctor than he was when he started, for the benefits of thesis work do not depend on the topic investigated, and the greatest of them is not specialised knowledge but an independent mind.

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[1] nough Committee (1944) Report of Inter-Departmental mittee on Medical Schools. London. Chap. 20.

Every candidate has his own difficulties and these are best dealt with individually by his supervisor. One difficulty—that of writing—is probably common to all and deserves a few words here. The presentation of results is as important as the conduct of the work itself and needs as much study. The man who is well read in general literature will have less trouble than others, but every candidate should study the technique of scientific writing. Textbooks and pamphlets on the subject are available; if studied with care, they will help the candidate to set out his work to the best advantage. The finished work should be read by one or more critics for the detection of obscurity, repetition, mannerisms, and lack of balance—faults that no writer, however experienced, can with certainty detect in his own work.

It is not desirable to restrict the topics of M.D. theses to particular departments of medical knowledge. The existence of separate degrees in medicine, surgery, and obstetrics (in Ireland only) no doubt underlies the opinion that M.D. theses should be on topics either in or closely relevant to clinical medicine. In this connexion it is important to distinguish between two of the several meanings of the words "medicine" and "medical." In a narrow sense they denote the field of work of the British physician and the American internist—namely, clinical medicine as distinct from surgery and obstetrics. In a broad and no less legitimate sense they apply to all branches of science and practice connected with health and disease; they are so used with reference to the profession itself, its education, journals, societies, official bodies, and university faculties. It is in this comprehensive sense that the word "medicine" should be understood in relation to the M.D., and any topic of professional interest to medical men should be admissible as the subject of a thesis—in other words, the M.D. should be the doctorate of the whole faculty.

The division of medicine (in the broad sense) into separate subjects is convenient for teaching, but research work is not always easy to classify. Specialists in different subjects often use the same techniques, and it may be difficult, for example, to say whether a particular thesis is surgical rather than physiological—nor does it matter, provided there are no departmental limitations on the topics permissible for the degree. Physicians and surgeons are nowadays largely concerned with the same problems, and the prohibition of surgical theses cannot be justified on scientific grounds. It may be that the fundamental objection is not to surgery, but to descriptions of surgical technique: if so, descriptions of other kinds of technique should logically be banned. It is, however, unreasonable to assume that the description of a new technique is necessarily less important than a record of work carried out by an established technique; the prohibition of theses dealing with technique is scientifically unsound, and every thesis—technical or non-technical—should be judged on its merits. It is true that surgical theses may count towards the degree of Ch.M., but surgeons who have no desire to take the associated examination should be free to submit a thesis for the M.D.

There is no objection to interviewing a candidate in connexion with his thesis, and universities might well reserve the right to require an interview. This right, however, should be exercised only when the examiners feel unable to reach a decision without further information. In practice, an interview should rarely be needed, and when required should be solely for
questions arising out of the thesis; it shoul
made an occasion for examining candidates in
or special subjects—if it were, it would be op
same objections as procedure by examination

TABLE II—DISTINCTIONS OBTAINABLE WITH TH

University	Gold medal	Prize	Honours	High commendation	Con dation
Aberdeen ..	..	+	+	..	–
Belfast ..	+	..	..	+	–
Birmingham	..	..	+	..	..
Bristol ..	..	..	..	..	..
Cambridge ..	..	+	..	..	..
Edinburgh ..	+	..	..	+	–
Glasgow ..	+	..	+	+	–
Leeds ..	..	..	..	..	.
London ..	+	..	..	..	..
Manchester	+	..	..	..	–
Sheffield ..	..	..	..	..	..
St. Andrews	+	..	+	..	–

Medical education, postgraduate as well a
graduate, is so dominated by formal examina
the M.D. by thesis should be carefully safegu
provides the only opportunity for the medica
develop his intellectual powers on individual
genial lines, unhampered by regulations and s
his work is done at leisure, and his reading—no
than the examinee's—is coördinated and pu
there is a well-defined objective in view. Ever
graduate should have the opportunity of taking
by thesis alone, and the universities that deny
amend their regulations. Even if the M.D. by
tion is retained in its present form, or sti
developed as a specialist qualification, pro
thesis should always be an alternative, and t
elect it should receive the respect due to
originality, and intellectual independence.

DISTINCTIONS WITH THE M.D.

Table II shows that distinctions may be awa
the M.D. by 12 of the 18 universities grantin
degrees.

Distinctions with the M.D. have been critici
grounds that they are not appropriate to a high
that they may encourage a spirit of pot-hu
that theses are difficult to grade. Those wh
distinctions inappropriate are perhaps influenc
custom of the non-medical faculties, which do n
the recipients of their higher degrees. It
remembered, however, that the M.D. is n
comparable with higher degrees in the n
faculties—at least, not with other doctor
such doctorates—for example, the D.Sc.
stantial amount of published work of high
normally required and in practice they are op
professional research-workers of mature expe
established reputation. The D.Sc. is a dist
itself, but one could hardly claim as much for
the M.D. is granted for work of limited scope
defined theme, comparable with that expect
M.Sc. or Ph.D., and the requirements are
stringent than for the D.Sc. The D.Sc. is aw
for first-class work; to insist on a similar st
the M.D. would be unreasonable, if only beca
great length of the undergraduate curricu
degrees of merit may be justifiably distinguis

It is true that theses are not always easy t
and inevitable that there should be differences
as to their quality. Such differences should n
removable by correspondence between the in
external examiners. The function of the examin
be limited to reporting on the merits of a the
making recommendations regarding distincti
award or non-award of the degree and any
should be a matter for a committee. Experienc

st suitable committee for this purpose would
d of the faculty, which is large enough to
bias on the part of the examiners; an
miner who knows that he may be subjected
g oral examination by his colleagues is likely
his report with great care. A small com-
l be less able to cope with a persuasive and
dvocate—whether for or against the candi-
ge committee often proves especially helpful
grading of a thesis, and the most valuable
s to debates on such questions are often
embers who are entirely detached from the
ndidate, and the examiners.

uld be little difficulty in classifying a thesis
; or as above the average but not first-
vorthy of acceptance—a grading that could
by the award of a gold medal, a commenda-
pass. Where finer distinctions are made—
, by recognising two degrees of commenda-
tion to a gold-medal class—the possibilities
ent are obviously greater.

btful whether M.D. candidates are in fact
y a spirit of pot-hunting; if they are, the
ly to be exorcised by the first few months'
most of them would be only too pleased with
isor's assurance that they have a reasonable
assing. In support of distinctions it can be
t theses undoubtedly differ in quality and
n be graded with a fair degree of accuracy—
t can be recognised, it is difficult to see why
ot be rewarded. Apart from actual awards,
existence of a system of distinctions may
good work and deter candidates from treating
ations as a matter of routine. The objections
o far been made to distinctions are not sub-
ough to warrant any material change in the
awarding them. Minor adjustments might
for example, a simplification of the grades—
sities not awarding distinctions might well
hether they are not depriving their abler
of a legitimate professional advantage.

SUMMARY

irements of the British universities for the
e are described and discussed in the light of
icisms.

). by examination is not serving a clearly
ofessional purpose. It could be made an
to the M.R.C.P. or be granted only for
s of a much higher standard; the best plan,
would be to abolish examinations as an avenue
)., a course that would be facilitated by the
of special branches of medicine as alternatives
medicine for the M.R.C.P.

D. by examination and thesis entails an
e division of the candidate's energies and should
inued.

D. by thesis affords a valuable intellectual
hat should be open to all medical graduates:
s that do not give candidates the option
ding by thesis alone should amend their
s.

ions on the subject matter of M.D. theses
esirable, and any topic of professional interest
l men should be admissible. Oral examina-
hesis candidates should rarely be needed and
confined to the subject-matter of the thesis.

can be graded with sufficient accuracy to
e award of gold medals and other distinctions;
es not awarding distinctions may be depriving
ler graduates of a legitimate professional
e.

debted to many university officials for information
of. S. L. Baker for reading the manuscript.

TEACHING OF PHARMACOLOGY IN THE U.S.A.

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IN 1945, with the aim of improving the design of our own practical pharmacology classes, a study was made of a selection of the teaching methods and materials in use in British medical schools. When, in 1948, I spent a year in America I took the opportunity of making a corresponding study there. The differences between the teaching of pharmacology and therapeutics here and in the U.S.A. were so conspicuous that the scope of the investigations was extended. This brief account cannot convey my deep appreciation of the excellence of American teaching methods. In all or almost all of the schools pharmacology is taught in the second year. A common distribution of the subjects in the curriculum is as follows:

First or freshman year	Second or sophomore year	Third or junior year	Fourth or senior year
Anatomy gross	Pharmacology	Pathology	Pathology
Histology	Pathology	Medicine	Medicine
Nervous system	Bacteriology	Surgery	Surgery
Biochemistry	Medicine	Obstetrics	Obstetrics
Physiology	Surgery	Public health	Public health
Medical psychology	Obstetrics	Pædiatrics Legal medicine	Pædiatrics

The general arrangement of the curriculum is well expressed in the bulletin of information of the College of Physicians and Surgeons of Columbia University. "Beginning in the first two academic years with a study of the basic sciences, particularly anatomy, physiology, biochemistry, bacteriology, pharmacology, and pathology, the student prepares himself for an understanding of the problems to be encountered in his later clinical work. The third and fourth academic years are devoted to mastering the methods of diagnosis and treatment of patients and acquiring a knowledge of disease patterns, emphasising in particular the more important fields of medicine, surgery, pediatrics, obstetrics, and psychiatry."

The teaching of experimental pharmacology is particularly impressive. The experiments are advanced and no expense seems to be spared to provide useful and cogent material to illustrate the principles of the subject. Large numbers of dogs, cats, and rabbits are used in the practical classes. The following list of the experimental animals used per 100 students taught gives some idea of the expenditure.

School	*Dogs*	*Cats*	*Rabbits*
A	83	200	120
B	37	100	160
C	400	50	100
D	140	24	104
E	200	—	64
F	50	—	200
G	150	166	—

The cost of food, maintenance, and purchase of experimental animals for the practical pharmacology class of school A comes to about £3000 per year.

Therapeutics is partly taught separately to pharmacology in that considerable contributions are made by the various specialists on the staffs of the departments of medicine, surgery, &c. The catalogue of one school lists the following departments as participating in the course: internal medicine, pædiatrics, nervous diseases, diseases of the chest, dermatology and syphilology, radiology, general surgery, orthopædics, ophthalmology, otolaryngology, urology, proctology, stomatology, and obstetrics and gynæcology. The large joint clinics were an interesting feature noted at some schools. At these a patient would be presented and the case reviewed and discussed for about an hour and a half by three or four staff members of various interested departments. These clinics were well attended and produced much lively discussion.

In the table the part-time teachers and research fellows and assistants have not been included in calculating either the hours of teaching or the number of medical students per member of the teaching staff. These part-time workers play a useful part in keeping research going while the full-time staff are teaching, preparing classes, and busy with administration. Some of them do a little teaching themselves and their joint efforts often make a valuable contribution to department duties. Figures for technical specialists and assistants were not available. Many of these people have university degrees and all are skilled operators or analysts.

In their report on "The Essentials of an Acceptable Medical School" the House of Delegates of the American Medical Association recommended that "For each 25 students in a class there should be at least one full-time assistant in each of the preclinical departments." The figures show that, with negligible exceptions, all the American departments studied comply with the ment. It is clear that there is a very generous of full-time teaching staff and that this staff backed by part-time staff, research assistants, assistants, and technical specialists. From my limited observations, it appeared that most pharmacology departments either have at l square feet (not including animal rooms) of fl at their disposal or will have it shortly. In no it necessary to run experimental classes more to accommodate all the medical students. In of the departments studied the teaching of basic student pharmacology occupied one term. The with two exceptions, took two terms. In most the total time devoted to pharmacology was of the time devoted to physiology. An American student spends about 5% of his total medical c clock hours at pharmacology. Pharmacology, is a subject of major importance, accorded vi with anatomy, physiology and biochemistry.

I would like to express my indebtedness to many for their kindness and hospitality and also for the and instructive frankness of their discussion and I am especially indebted to Prof. John Fulton Donald H. Barron, whose physiology dep Yale was to me during my stay there an e liberal organisation and leadership that I will remember.

STAFFING OF AMERICAN PHARMACOLOGY DEPARTMENTS

American medical school	Teaching staff		Research fellows and assts.	Students per year	Lecture hours per student	Experimental class hours per student	Experimental class multiplication	Total hours of pharmacology done by student	Total hours of student teaching done by staff	Students per full time teacher
	Full time	Part time								
California	11	1		70	44	100	(?)	141	241(?)	6
Chicago	5	34	13	55	40(?)	40	2	80(?)	120	11
Colorado	3	4	..	60	..	..	..	..	..	20
Columbia	5	..	1	125	72	48	2	120	168	25
Cornell	8	4	2	80	..	..	..	121	121	10
Duke	3	1	..	70	..	..	..	121	121(?)	23
Harvard	8	2	6	130	84	58	2	142	200	16
Iowa	3	..	..	60	60	45	..	105	150(?)	20
Jefferson	6	..	1	160	80	128	2	208	336	27
Johns Hopkins	8	..	1	70	40	40	2	80	120	9
Loma Linda	8	..	..	80	140		..	..	..	10
Maryland	8	..	5	70	106	106	2	212	318	9
Michigan	5	1	12	115	48	96	2	144	240	23
Minnesota	4	..	..	100	99	66	..	..	..	25
New York	8	..	..	120	30	100	2	130	230	15
North Carolina	3	1	..	45	80	66	2	146	212	15
Oregon	3	1	3	65	110	66	..	176	..	22
Pennsylvania	10	7	2	108	60	111	2	171	282	11
Rochester	16	19	..	65	120		1	120	120	4
Southern California . ..	5	..	3	66	..	..	..	176	..	13
Stanford	5	..	3	60	55	110	1(?)	165	198	12
Temple	7	..	3	100	60	94	2	154	218	35
Utah	8	..	4	49	48	145	1	193	193	6
Washington	4	1	..	50	70	54	2(?)	124	178	12
Western Reserve	5	..	5	76	168		1	168	168	15
Wisconsin	3	..	2	60	64	48	2(?)	112	160	20
Yale	6	2	1	60	70	70	1*	40	140	10

.. = Figures not readily obtainable. *Basic medical student teaching only.

This table is mainly based on medical school catalogues and the figures are approximate only.

PROS AND CONS

uld the first M.B. examination be taken at school or university? The first two articles printed below express q views on this question which, though not new, has been discussed with fresh rigour during the past few years me of the universities have had relatively more vacancies in the first than the second year—occasionally with the result that a student who has passed the examination from school has studied for it again at the university. In ıd pair of articles two university teachers voice differing opinions on postgraduate qualifications, centring their ıts on the M.R.C.P. examination, which was the subject of a report last month by a committee of the college.

THE FIRST M.B.

discussion of the proper place in which to teach emedical subjects of physics, chemistry, and must first deal with certain fundamental aspects ical training.

ıg the last half-century it has become increasingly hat the system of medical education is tending nd more to produce individuals possessing (at hen appropriately examined) a mass of poorly ted factual data and a steadily diminishing y for critical assessment and broad constructive ng—in brief to inculcate knowledge without ı. It has even been proposed that there should *brands of medical men*: (1) a numerically major trained along strictly vocational, and inevitably c, lines in a technical medical school; and (2) t minority who would receive a university type ning with its implications of broad foundation on l science and development of the critical faculty. roup would presumably form a sort of officer class which alone would be drawn the medical academi- the specialists, and the investigators. With any proposal I disagree completely: nothing would ter calculated to destroy medicine as a profession. alue of the doctor to the community does not ith his care of the individual patient but includes fluence he has on the life and thought of his fellows. rry out this function effectively he has to be an ted person, not merely a technician; he must le to appreciate the habits and behaviour of man ocial animal in relation to his past, his present, and ture: above all, he must have critical powers which nable him to separate the grain of truth from the of specious and meretricious polemics which is the ıt coin of political propaganda. Furthermore, any educational dichotomy presumes the feasibility parating the two groups before the age of twenty: he science of psychological selection is at present ed for this task.

THE NARROW AND THE BROAD

late years vocational instruction has been introl into school education; and the last two years at l are now often devoted to fairly intensive study small group of subjects—for instance, chemistry, cs, and biology—to the detriment of broad cultural ing. This trend has been greatly encouraged by the m of awarding scholarships and—in England but n Scotland—by the possibility of exemption from edical subjects in the university, enabling the ıt student to pass directly to the preclinical subjects ıatomy and physiology.

ıe British Medical Association's admirable report ıedical training[1] expresses in elegant terms profound pproval of this practice. While agreeing completely this viewpoint, I do not believe that there is ısic merit in the conventional classical education, eby the scholar gains a substantial knowledge of ı and Greek to the exclusion of training in science. ly the lessons to be learned from a study of the ics are of two kinds. The first is the intellectual discipline and exercise derived from mastery of a foreign language—valuable training but one that can be equalled by study of a modern language or indeed of any coherent body of factual data. The second and much more important lesson is concerned with insight into the intellect and behaviour of man and with the inculcation by precept and example of the classical qualities of restraint and toleration base on the concept of man as an intellectual and moral animal. In this respect the lesson of the classics is also the lesson of human biology, which in its broadest functional sense is the study of the whole range of adjustments whereby man achieves the equilibrium with his environment which Herbert Spencer has described as the ultimate aim of all biological endeavour. This second advantage of the classical training could equally well be won from a study of English translations of the relevant texts, and the enormous time saved by excluding ancient linguistics could be devoted to an integrated cultural curriculum embracing English language, mathematics, a modern language, and general science including biology. Instruction in history should not be the conventional record of dates and dynasties but the story of mankind in relation to an environment, turbulent both in its purely external material aspect and in its internal moral aspect, as epitomised by endless conflicts of ideologies and "-isms." Such a presentation would at last integrate the useful aspects of the classical tradition into the broad stream of general science.

THE MISSING R

An essential facet of the training should be mathematics. It is astonishing that whereas an intimate knowledge of the mother-tongue is always regarded as an indispensable aim of good education, no such obligation seems to be attached to the language of space and number. An honours degree can be obtained without knowing much more about mathematics than is needed to obtain correct change in the tram. Even among those who have had some mathematical training comparatively few know anything of the laws of chance or the methods of assessing significance and correlation in numerical data. Yet knowledge of this sort is a prerequisite to understanding of the quantitative aspects and trends of populations of measurements, whether they relate to morbidity and mortality or to political economy and sociology.

Some of the conventional content of mathematics as taught to the senior forms could with great cultural advantage be replaced by elementary statistics, the examples for which could be drawn from the biology class. For instance, the method of assessing the significance of the difference of yields of two plots in the school garden seems to me to involve much less intellectual effort on the part of the teacher and the taught than the intricacies of Greek grammar or some of the theorems of solid geometry. At the same time training in statistics is cultural in the widest sense, for it introduces the pupil to some of the fallacies as well as some of the precisions of the quantitative approach to phenomena. A community with a high proportion of people with this knowledge has gained some immunity to the petty and specious misconceptions which mar so much popular belief.

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e Training of a Doctor: report of the medical curriculum ommittee of the B.M.A. London, 1948. See *Lancet*, 1948, , 839.

I consider that premature specialism in school education has had a most harmful effect, and that a return to a broad cultural programme with little or no vocational bias is a vital necessity. Probably the biggest obstacle to reform is the lack of suitable teachers. Most of those who are already teaching are themselves the victims of premature specialism, and find it difficult to take part in a comprehensive, closely knit, cultural syllabus; indeed they are often imbued with blind devotion to their own subject, a study of which they conceive as the only gateway to educational salvation.

THE DEVELOPING MIND

If the schools are to provide a wide education it will be impossible for them to instruct future medical students in chemistry, physics, and biology up to the standard where university training in these subjects can be obviated. That it now often can be obviated is the clearest proof that schools are failing in their duty to ensure education suitable not only for earning a livelihood but for citizenship.

This practice of giving premedical instruction in schools ignores a most important distinction between school and university training—an inescapable distinction because it is based on differences between the adolescent and the adult mind. Up to the age of 17 or 18 a considerable element of didactic authoritarianism is probably necessary in teaching, since the average young mind finds difficulty in grasping the full implications of the scientific method with its emphasis on accuracy, quantitative observation, the designed experiment, and controls and statistical tests. In science there are no opinions, no ideologies—only facts, measurements, and correlations upon which are based hypotheses with no transcendental merit of their own but depending on the observations they claim to integrate. To instil this attitude is the first and most important duty of university education, and it must remain its exclusive prerogative not for any petty monopolistic reasons but because it is only in an institution where devotion to research and discovery exists on a parity with teaching that such a tradition flourishes. Instruction at university level has another quality which distinguishes it from schoolroom learning—that is, continual emphasis on the unknown. In fact it has been said whimsically that the educational function of a university is to teach what is not known. Engaged equally on research and teaching, the university teacher avoids that element of didactic authoritarianism which, useful as it may be in the schoolroom, stifles inquiry and is the negation of the scientific outlook.

Universities rightly insist that their teachers shall engage, or shall have been engaged, in research, partly because this is a leaven which converts instruction into inspiration and instils love of learning and veneration for truth. Such an outlook is the only sure protection against that didactic materialism and intrusion of political ideology which, under the name of Michurinism, with its denial of the incontrovertible principles of mendelian genetics, threatens the scientific life of the U.S.S.R. and ultimately that of the whole world. Even in the university, chemistry, physics, and biology should not be taught to the medical student as vocational subjects but in common with students destined for other careers.

Thus my contention is that the premedical subjects, while taught at school as part of a broad cultural syllabus, must also be taught at the university and used for instilling the scientific method. Devotion to such an [illegible] against medicine deteriorating [illegible] all that has been achieved in the long struggle to bring science to the aid of clinical practice and to put an end to the mass of medieval empiricism and mysticism which under such as the "art of medicine" or "clinical instinct" patient and doctor alike.

W. MELVILLE ARNOTT

Professor of Medicine, University of Bi

* * *

ANY inquiry into the relative merits of te subjects of the first M.B. examination—namely, chemistry, and elementary biology—at school versity should begin with the question: Of w is instruction in these subjects to the medical st is the place occupied by such instruction at adequately filled?

There are of course good reasons for ret subjects as part of medical education. Anyone spend his life in the field of human biology be acquainted with the elements of these th sciences; and this need would continue eve doctor did not constantly employ the elemen niques of physics, chemistry, and biology in the of his practice. Moreover, it is essential that in clinical training the student should learn to d between facts derived from observation and ex and extensions beyond the facts or conclusions dr them about which it is often necessary to p open mind. Anyone who has engaged in clinical will know how readily "it may be" becomes "i how confused the average student becomes w fronted with a problem whose solution requires a of the objective and scientific judgment w preliminary training should have instilled. the student should understand when he is e inductive, and when deductive, reasoning so tha recognise that which requires further obser experiment before it can be accepted as establish

TEACHING METHODS

Unfortunately medical education today fall deal short of complete success in all of these This is not a matter of curriculum but rather of The perennial discussions which have as the the improvement of medical training have o almost entirely concerned with the number o to be taught and their relation to one another ra with the lecturer's approach to his subject teaching techniques and methods of pre Here is a wide field for observation and exp and the immediate need is for a method by results of different teaching methods can be c All too often the first-year university courses in c physics, and biology, far from instilling a lov respect for, scientific methods of thought, see student to offer a mass of irrelevant and a unrelated facts. Yet there is substance to the that this is because the average student reachin school is ill-equipped to profit by the kind of that should benefit him later, and that in students get the kind of instruction they deser

This implies a defect in the previous edu school; and certainly the student should be into contact with scientific discipline before h the university, so that he may benefit fully from advanced teaching which it should be the busin university to offer. The present first-year class medical faculties are necessarily large, with ha opportunity for individual instruction and g yet to teach scientific habits of thought, and the between inductive and deductive reasoning as w tween experimental facts and conclusions dra them, requires individual instruction, careful su and discussion in small groups. The real purpo instruction at present given in the first yea medical school is not to impart information he student for the study of physiology, bio- -, and anatomy with which medical education)egins.

THE SCHOOLS' RESPONSIBILITY

·eparation, requiring a habit of mind rather ackground of knowledge, should begin early; senior science teachers at schools are best give the necessary individual instruction with ttention to the difficulties of particular students. ruction is already given in the upper forms of hools, where the teaching of science some- :hes a high level; but a large number of schools unable to offer training in medical physics, ·, and biology.

training in science begins with the making of ›servations; from these are drawn conclusions lidity is examined by experiment. In this way ›nt is gradually introduced to the experimental ·; and the results of a number of experiments are l in the construction of a hypothesis, the useful- ·hich can be tested by further experimentation. roach is generally more valuable to the medical in his clinical work than the more common of instruction in the basic sciences of enunciating ·' and then setting the student an experiment proves" it.

points are mentioned in order to underline the ice of the earliest instruction in science and to › the plea for a secure foundation in science ie student faces the problems and readjustments rsity life. The responsibility of preparing the for the first M.B. examination is small compared s task. If the form of the first M.B. examination anged this responsibility could be discharged chools. The student should then arrive better d to undertake the more advanced biological of physiology, biochemistry, and anatomy, dy of which involves not only the continued ion of the scientific discipline, to which he ome accustomed at school, but also detailed anding of the workings of the human body.

THE PRECLINICAL YEARS

ching plan designed to subserve these ends would cessarily contain all the material at present l in the first-year medical course. For example, t not be practicable to include organic chemistry; ng with elementary statistics and genetics, could ided in the early part of the university course, t five terms of which would then be devoted lly to biochemistry, physiology, and anatomy, the sixth term free for the most difficult, and at in many respects the least satisfactory, period— , the introduction to the study of disease.

ie proposal to transfer, in modified form, the ar medical subjects to school education were to pecialisation at an earlier age, it would stand ned; for even today the prospective medical ; is required to specialise too young. In the ts of a more liberal education the medical school, l of its responsibilities for teaching elementary , chemistry, and biology, could introduce a number tive courses into the first year of study. The ty of these should be non-medical—for example, natics, social science, political economy, philo- and psychology. If this conception be correct, ie statement that instruction in physics, chemistry, iology should properly be undertaken only by rs who also prosecute research is somewhat wide mark. The initial stages of medical education, ating in the first M.B. examination, require qualities instructors somewhat different from—though by ans excluding—a capacity for original work.

Only when he has learned to appreciate the scientific method is the student equipped to undertake the study of the more advanced biological sciences, where so much is uncertain and so much unproved. Only by enlisting the coöperation of the schools can more time be obtained for teaching the basic medical sciences, the further study of which is the greatest need in medical education today.

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THE MEMBERSHIP

"Education is the development of the reasoning faculty in man and the gift to him of means to use this to the best of his ability."—C. M. BOWRA.[1]

It is customary for teachers to blame their difficulties and failures on their predecessors: the university on the secondary school, and the latter on the elementary school. My own experience leaves me in no doubt that the troubles of postgraduate education are engendered in the curricula of the undergraduate schools. The overburdened undergraduate, coping with over-departmentalised segmentation of medical knowledge, has too often failed to achieve any real mental synthesis. This will never be corrected until we have reoriented the curriculum around Medicine as a science in its own right. "It is not profitable to study theory without some practical experience of the facts to which it relates."[2] Physiological, biological, physical, chemical, pharmacological, and pathological theory must be studied in relation to the problems of medicine itself, interest being roused by demonstration on the patient. This has become our task in the postgraduate period.

It may be objected that medicine, as well as being a science, is an art based on experience of the natural history of disease, and that the direct study of the sick and their symptoms is not necessarily scientific. There is here no hard and fast line of demarcation. The observational faculties of a trained clinician may form the basis of quite secure logical deductions even though the facts are intractable to any form of numerical measurement or graphic registration. The learning of this part of medicine takes a lifetime of experience. With the inevitable progression of modern medicine, however, empiricism gives way continually to science: the deep sighing respiration of Kussmaul is related to the degree of diabetic acidosis, and jaundice without bile in the urine becomes the sequel of hæmolysis. The old and permanently valuable clinical correlation remains, but it is better understood.

The imponderable character of the art renders this part of medicine peculiarly prone to dogma and empirical rules. The nature of our work as clinicians fosters looseness of thought, for we are in the unfortunate position of having to give explanations of many incomprehensible phenomena, if not to students, at least to patients or their relatives. If we are to turn out competent specialists, we must not only ground them well in the art but teach them that progress in understanding can be attained only by the application of meticulous observational and scientific method. Contact with the scientific approach will sharpen the powers of observation of our budding specialist, develop his critical faculties, and enable him to perceive innumerable weaknesses in our systematised "knowledge," even in some of the most hallowed and respectable of our beliefs. In certain instances the young man, so exposed, will take the opportunity to seize the initiative, will demonstrate his own capacity for originality and logical thought, and will be easily marked out as a potential leader.

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1. Reflections on Our Age. London, 1948.
2. Livingstone, R. The Future of Education. Cambridge, 1944.

THE EXAMINATION BURDEN

The principles of postgraduate training of the specialist laid down by the Royal College of Physicians envisage the provision of just such opportunities for the acquisition of scientific discipline. The biggest hindrances, however, in this admirable scheme are postgraduate examinations. While examinations may be a necessary evil in the undergraduate period, a rigid code of formal tests imposed on a developing adult mind may be a serious insult. Boards of examiners have the best of intentions; but, rightly or wrongly, examinations perpetuate the textbook complex of the undergraduate, and put a premium on the often outmoded textbook ideas of yesterday. Young men dare not dwell too deeply on their research interests lest they develop "dangerous ideas" in the eyes of their examiners. Higher qualities of scholarship, capacity for original thought, and special aptitudes in particular branches of medicine handicap rather than help in the higher examinations. Formal examinations are not suited to the questing mind and are more readily passed by those with good memories and simple faith.

Take the converse side of the picture. Success in the membership may prove the practical performance of a young man today but it does not guarantee that his standards will be maintained next year or—more important—a decade hence. So we come back to the necessity of recognition by colleagues of high clinical capacities gained by experience: only in this way can we choose our future specialists. No examination label or diploma can replace this judgment. The positive recognition of excellence is infinitely better than the negative method of excluding those who falter before a monstrous examination barrier.

THE REMEDY

We live in a period of our professional history in which we have slipped our cables from many valued traditions. We should also have the courage to jettison a few that are less worthy, in order to unburden the maturing minds of our young graduates. Abolish the need for *multiple* higher degrees and diplomas. Against the background of the necessary experience accept the demonstration of academic excellence by thesis, by published work, or by discussion before our alert learned societies. Our universities could help by greater uniformity and vigilance over the granting of doctorates, and a successful M.D. by thesis should be an alternative channel to specialism. Let our hospital boards cease the reiterated demand "M.R.C.P. essential," though they might suggest that a higher degree or diploma was desirable. We should get rid of the necessity for special coaching and cram courses: these can never be an educational credit to any country. Study for examinations cramps and harasses excellent young men from our Dominions. Let these men rather acquire method by studying the example of our gifted teachers; let them acquire a philosophy of medicine in our country, where the individual has a dignity higher than in most others; and let them learn technique, outlook, critique, accurate observation, and biological sense from our leaders in medical science. Let them refresh themselves in the living stream of new knowledge and inquiry, and abolish the necessity for stagnation among the backwaters of the outworn knowledge of yesterday.

Our colleges would do well to ponder the words of Dr. Alan Gregg,[3] recently addressed to the American College of Physicians: "A way to raise the general performance of specialists is to exert jealous and vigilant control on behalf of excellence, variety, and freedom to go beyond our present knowledge."

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[3] Gregg, A. *Ann. intern. Med.* 1949, 34, 810.

> "Depend upon it, Sir, when a man knows he hanged in a fortnight, it concentrates his mind fully."—SAMUEL JOHNSON.

It has been well said that the art of conve *to its lowest level when sustained by* qu answer. Similarly at examinations the human prostituted for a purpose blatantly utilit normal people enjoy examinations and nobody *submits to the depravity of acting* as an ex from a sense of duty or out of regard for the *reward.*

Confidence in the reliability of scholastic e for children has been shattered by Valentine's[1] survey. Further it must not be forgotten that an *tion result* constitutes a pronouncement on the of the teachers and examiners. Uninspired and native lecturers no less than bigoted and o examiners have much to answer for. Not a "follow-up" reveals the poor prognostic si a formal examination. Indeed there are times onlooker might well ask: *Quis custodiet ipsos* These observations are merely part of a wider expounded as long ago as 1570 by Roger Asc to Queen Elizabeth:

> "This I know, not only by reading books in my also by experience of life abroad in the world, which be commonly the wisest, the best learned, men also when they be old, were never co quickest of wit when they were young."

Nevertheless Johnson's dictum has a wide ap and most certainly embraces the subject of exa Much as we may deplore the custom of exa have to admit that it galvanises the sluggard into and rivets his attention on the need for properly grated study. There is room for doubt as to the bility of assessment by examination in the hu but there can be none about the need for exam the applied sciences including the practice of Such bodies as the Institute of Naval Archit Institute of Chartered Accountants, the General for Medical Education, and the Pharmaceutical are monuments proclaiming the misgiving with the public regards the individual's declared in however laudable these may be. Organised socie to these and a score of similar institutions as of proficiency in professional callings materially the well-being of the State. Such corporations their obligation most conveniently (though not sively) by means of the formal examination.

SPECIALIST AND GENERAL PRACTITIONER

These considerations have an important bea medical qualifying examinations, but they apply special force to the award of postgraduate which specialists are now expected to possess.

Notwithstanding the old gibe that a specialist is who knows more and more about less and less, t no doubt that he continues to enjoy a higher st the eyes of the public than does the general practi This *state* of affairs has been thrown into sharp by trends in the development of the National Service, though few within the medical profession the average layman's view of the relative importa the *general practitioner* on the one hand and the sp on the other. A moment's reflection must show th decision to specialise is rarely determined by outst *intellectual ability*: rather is it the result of a *preference for some branch of* medicine and the accident that resources are available. Moreover doctor on the *threshold of his* career may be swa the conviction that the wide sweep of general p and the exacting demands which it makes on ph ice are beyond his compass. As a corollary it stated without hesitation that the intellectual of general practitioners as a body is at least equal of their contemporaries who have specialised.

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[1] Valentine, C. W. The Reliability of Examinations. 1932.

THE MEMBERSHIP

comparisons, if odious, are nevertheless pertinent examiners for a specialist diploma cannot set andard to match the capabilities of a superman. R.C.P. should be within the grasp of any doctor average ability and native wit who is willing to to the discipline of intensive reading and authori- nstruction. This attainment is not to be regarded ething reserved for a specially gifted minority. ploma is a professional high-jump within the ence of most young doctors who are prepared to the necessary sacrifice; but such an athletic ance becomes increasingly difficult with the of the years, and many are too old at thirty.

t the examiners do demand is absolute proficiency knowledge and technique tested in a qualifying ation; and a candidate who is found wanting in eory and practice of such fundamentals must no mercy.

e second place the examiners expect the candidate y his familiarity with physiological mechanisms oducing them naturally and effectively into his ion of the principles of medicine. This require- provides the most searching test of the whole ation, and insistence upon it largely accounts for h prestige of the membership diploma. Far from unfair it sets a premium on orderly thinking and s the coup-de-grâce to those who have not schooled lves in the elementary principles of logic. Unfor- ly many worthy candidates find this hurdle larly difficult. Though well read and highly ent, they suffer from a peculiar form of mental which renders them incapable of mobilising the ation under examination conditions which include xorable time-limit.

and certainly least is a knowledge of rarities. on things most commonly occur, said Samual Gee; is aphorism is never forgotten by examiners who their business. Contrary to popular belief, rare s do *not* occupy a large part of a specialist's g day. He is much more often engaged on unusual stations of common maladies; and he will be ed as a specialist mainly for his capacity to cope these unexpected and puzzling developments. heless in a postgraduate examination it is perfectly ble to test a candidate's knowledge of bizarre mes and clinical oddities. To do so is merely to ate the demands which will occasionally be made im by the general practitioner. As with other of the examination, the importance attached to ind of knowledge is subject to the examiners' ion; and it cannot be doubted that these assessors lways be experienced consultants with a well- ped sense of perspective. The M.R.C.P. examination is conducted with certain general principles in ather than a set of rigid rules, is a flexible instru- designed by and for a very peculiar people.

SELECTING THE COMPETENT

le the M.R.C.P. may set proper standards for those ofess to be specialists, it would be puerile to suggest ossession of this or any other diploma should be ed as the sine-qua-non for advancement in all lised branches of medicine open to the physician. xamination can at best serve to select physicians re professionally competent in the sense that has lescribed; it would be palpably absurd to suggest when a man of five and twenty has obtained this f approval from the college he can claim to be ing but a beginner in a particular branch of the whole subject of medicine. At this stage he may have little more claim to merit than a promising craftsman or an efficient tradesman; many years must elapse before he can acquire the wide clinical experience which he needs—to say nothing of maturity, judgment, shrewdness, insight, tolerance, and many other virtues, not the least valuable of which is a sense of humility.

Happily there are still men and women in the profession of medicine who are a law unto themselves and who make no pretence at conforming to convention unless such action can be justified on first principles. This small minority includes some of our ablest research-workers and teachers, and a heterogeneous group of practitioners who have discovered in medicine a useful introduction to literature or art, religion or philosophy. Some of these, possessing the precious gift of originality, are destined to make important contributions to medicine. To urge such intellectuals to submit to further formal examination is to be guilty of philistinism in a particularly offensive form. Augustine Birrell has adequately commemorated our valued if eccentric brethren:

> "... it must be owned that great creative and inventive genius, the most brilliant gifts of bright fancy, happy expression, and a glorious imagination, well nigh seeming as if it must be inspired, have too often been found most unsuitably lodged in ill-living and scandalous mortals."

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Reviews of Books

Essentials of Orthopædics

PHILIP WILES, M.S. Lond., F.R.C.S., F.A.C.S., orthopædic surgeon, Middlesex Hospital, London. London: J. & A. Churchill. 1949. Pp. 486. 42*s*.

SECTIONS on orthopædics in the standard surgical textbooks have, with more rigid specialisation, become superficial, and hitherto most orthopædic textbooks have been too abstruse or too compact to be of much use to the struggling student. This eminently readable and well-selected book should prove most useful, for it is simply written, covers a vast amount of bone and joint disease in its well-illustrated chapters, and is authoritative without being dogmatic. Early chapters deal fully with the problems of postural defects, which must surely try the ingenuity of those in general practice; they are so common and so difficult that it is wise to allot a good deal of space to them. Chapters dealing with the deformities and diseases of the various joints follow, and a final relatively short section covers infections, tumours, and diseases of bone and the nervous orthopædic affections. These sections are all most carefully compiled, and little is missing. Since the author has wisely refrained from including traumatology, diseases of bones and joints appear in their true perspective, not lost in a welter of strains, sprains, and breaks. This delightful book will undoubtedly go into further editions.

Anæsthetics for Medical Students

GORDON OSTLERE, M.A., M.B. Camb., D.A., late senior resident anæsthetist, Hill End (St. Bartholomew's) Hospital. London: J. & A. Churchill. 1949. Pp. 108. 7*s*. 6*d*.

THE practice of anæsthesia, like that of surgery, is gradually becoming the province of those who have had special postgraduate training. However, just as the general practitioner will probably always be called on to perform certain simple operations, so will he continue to be called on to administer simple anæsthetics for them. It is clear then that this ability must still be acquired during the medical course. Most of Dr. Ostlere's book deals, as it should, with the practical side of anæsthetics, telling the student in a conversational but lucid manner just what premedication to give, how to administer the common anæsthetics in a simple way, how to keep a good airway, and how to avoid or treat the more common troubles that arise during the administration. He is evidently an enthusiastic teacher and he can hardly inevitably, less efficiently than before. Many are earning appreciably less. Instead of encouraging the growth of partnership practice, the Act has made it increasingly difficult and unprofitable for a doctor to take an extra partner. Payment by level (and not over-generous) capitation fee with a permitted maximum of 4000 patients does little to encourage a doctor to keep his list small enough for careful, vigilant, and unhurried service to his patients; nor does it secure any effective recruitment to the under-doctored areas. True, the general practitioners have themselves suggested an increase in the remuneration to be paid for the first 1000 patients on a principal's list in the hope that this will make small lists less of a liability and provide better partnership prospects. But the implementation of this proposal hangs upon securing extra millions from a reluctant Government; and even should this be secured, if doctors are to be redistributed really effectively there will still be need for progressive reductions in the permitted maxima on lists to a figure much nearer three than four thousand patients. Without these reforms we are in danger of accepting standards of practice lower than those we know are needed.

The negotiation of amendments of this sort is a matter for discussion between the Government and the doctors. But there is another side to the question of recruitment to general practice that concerns the profession alone. The general practitioner sometimes feels that he is regarded as the Cinderella of the profession, not only by medical students but *also—only too obviously—by consultants* in the teaching hospitals. It is a strange anomaly that despite the large proportion of medical students who eventually enter general practice, their education and inspiration during the most receptive and formative years is left almost exclusively to men who have themselves never been in general practice and have little understanding of its needs and difficulties. Who can be surprised that the student does not often gain a true appreciation of the opportunities and satisfactions which general practice can offer, nor sometimes even the training which will best fit him for his eventual vocation? In a memorandum of evidence[2] submitted in 1943 to the Goodenough Committee, the British Medical Association said:

> "Complaint is frequently made by general practitioners that they did not receive as students the knowledge that they later found to be essential in their daily practice. It is said for example, that teaching given in children's illnesses, nutrition and dietetics, infectious diseases, and psychoneuroses is often quite inadequate. In some schools the student is not given the opportunity of mastering the technique of such surgical procedures as a general practitioner may properly be called upon to undertake. . . . The Association suggests that medical education would be assisted if suitable general practitioners were invited to advise on and be associated with the training of the student. Medical faculties or medical school committees might with advantage include one or more general practitioners in their membership. The function of these practitioners would be to advise on the curriculum so far as it related to subjects of particular importance in general practice and to ensure that adequate attention was given to them . . . . In the actual teaching general practitioners could render valuable help."

Very few medical schools have so far
steps to implement this policy, but t
emphasis rightly laid on social and en
factors in the production of ill health h
revival of the suggestion that the experie
practitioner has his part to play in medic
Some even go further, saying that gene
will not get its rightful place, nor the fu
tioners their proper training, until chair
practice are established in our medic

At first this suggestion seems fancif
cannot limit or define a separate faculty
practice—its field is as wide as medicine
would it be possible to find anyone p
teach all the subjects the future general
needs to study. Yet the suggestion sh
dismissed without examination, and p
without trial; for it may perhaps offe
uniquely, the very opportunity needed fo
from the academic side the future devel
advance of general practice. The doc
for such a post would need to be well ex
general practice, and to be capable of
experience to advantage and conveying i
his students. He should continue to sp
his time in general practice; for, divorc
regular contact with practice, his teac
quickly become outmoded. When eventu
health centres, some could be used for th
of medical students. Indeed thought
been given to establishing, in association w
hospitals, university health centres which
for teaching. This must be achieved
displacement of doctors already practis
neighbourhood; indeed it will almost
necessary to build the centre round a cl
of men already established, reinforcing
specially recruited colleagues as opportuni
is at such a centre as this that a professo
practice would ideally have his headqua
here and in the homes and the workpl
patients served by the centre that he and hi
would demonstrate to students the m
problems, and the philosophy of general p
the medical school itself his rôle would b
to the students, perhaps particularly on
maladies, the dietetic errors and the pet
infancy, and the host of other subjects wh
daily responsibility of practitioners but
neglected for weightier subjects. He sh
that the students are afforded ample opp
gain proficiency in the techniques of gene
He should advise on studies and on ex
He would watch over the need for p
instruction for general *practitioners*, a
also play his part in reversing the growin
taken tendency to exclude the general
from all participation in the hospital s
itself another way in which general practi
changed to its great disadvantage and wi
no gain to the patient. He would be able
the instruction of the departments of
preventive medicine, and in particular b
an understanding of the repercussions th

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2. British Medical [illegible] Memorandum of Evidence submitted to the [illegible] Committee on Medical Schools. Lond [illegible]

3. See *Lancet*, 1949, i, 372. Layton, T. B. *Ibid*, p. 4 W. *Ibid*, p. 458. Leeson, H. *Ibid*, p. 458

ae and family, insecurity or anxiety, worry or e on the health of the individual. Above all d inculcate appreciation that the patient is a case but a person and a member of a a consideration that is instinctively in the loctor's mind, shaping his own background ely accounting for his value to the community. his point of vantage in the university, the r of general practice would exert an influence denied to the general practitioner. Such an e, permeating and reorientating the student vould help to bring a new dignity to general , and ensure for the country a steady stream ors well prepared and well satisfied to enter practice.

The New Bacteriology

stream of knowledge is no man-made canal but a brook whose long quiet pools are divided l and sparkling stickles. So it is that methods action in medicine pass from teacher to teacher o change beyond some new facts, some new ks, and sometimes a new illustration. Change, t comes, springs from one man who risks he conservatism of students and the wrath miners. MALL raised anatomy from a slut narnel house and married her to physiology; e nest of fledgings fostered by ELLIOT SMITH ver Street has perpetuated her respectability. ictum by VIRCHOW changed the teaching of ogy throughout the world—not entirely, per- o its ultimate benefit. It was the principles than the practice of medicine which led OSLER e the wisest of all textbooks. These are signal , and they would be more numerous were it : the common and proper caution in experiment expense of others. Pedagogy, like therapeutics, eld for hasty empiricism. Thus special interest es to the proposals for the reform of bacterio- teaching made by Prof. ROBERT CRUICKSHANK inaugural address on succeeding to the chair teriology at St. Mary's Hospital.[1]

re must classify the sciences, bacteriology is a n of botany and the physician does no more than parts of this science which bear on the cause and of disease. But since much of our knowledge ndamental bacteriology arose from inquiry into ems of human disease, the teaching of this subject, e practical class at any rate, has retained a ical aspect. Bacteria are so long and so broad; metabolise this or that; a staphylococcus in clumps and a streptococcus in chains; move (*pace* PIJPER) by waggling flagella. A f the kings of Judah would be more useful in al practice. True, the student learns to stain ercle bacillus; but we are convinced that few uments are used less often in the surgery than a scope, and it is probably better so. The matic lecture will, of course, mention such ical topics as the Schick test; but to most ents this remains a procedure whose use is ed to medical officers of health and whose description is popular with examiners. The teacher of ology cannot overlook the effects of bacterial tion, and cunning mnemonics remind the forgetful of the distinction between a tuberculous and a typhoid ulcer of the bowel. That the student does not emerge on the world ignorant of all the gifts to mankind of PASTEUR and KOCH is due to those who teach him medicine and surgery, and, above all, to the long-suffering superintendent of the hospital where he "does his fevers."

Before he came to St. Mary's, Professor CRUICKSHANK was director of the Central Public Health Laboratory; and like others who have tried to put their knowledge of bacteriology at the service of their fellow doctors, he is unhappy at the prevailing ignorance of the applications of bacteriology to medicine and surgery. The laboratory has functions besides the examination of sputum for tubercle bacilli, and there are reasons other than fear of "missing a dip." for swabbing the throat of the patient with tonsillitis. Technical advances give more and more assistance in the diagnosis of infectious disease and the detection of their origin. Through a variety of causes, originating as much in financial stringency as in specialised knowledge, the very treatment of some infections now falls within the ambit of the bacteriologist. So it is that Professor CRUICKSHANK's views have a strong practical bias, and his suggested course might fairly be called "bacteriology as applied to medicine." We think that the chief importance of his suggestion lies, not in any omissions, but in a dissection of the subject as it now stands and the assignment of the parts to their logical places in the curriculum. The botanical aspects, morphology and physiology, he would promote to the first year of study with the rest of botany; surely among the smaller forms of life the student might learn as much about an anthrax bacillus as about a slipper animalcule? He suggests that the next occasion on which the student should meet bacteria would be in general pathology. The relation of host and parasite is a subject stimulating to teacher and pupil, and it is taught today exceptionally well; inflammation, immunity, and allergy are the algebra of infectious disease, and the closer these are linked with the reaction of the organism to the rest of its environment the better. But Professor CRUICKSHANK is probably right in assuming that the next step—the relation of the parasite to the community—is hardly taught at all. To the practitioner immunity must be a matter of rule-of-thumb with a bias in the direction of safety. Yet the spread of disease and the means of limiting it are problems of every daily round. Prophylactic chemotherapy, the danger of nasal carriers of streptococci, the "sterility" of water in the operating-theatre—these are everyday matters far more important than the thirty-nine causes of an enlarged spleen. There is real need for a course in preventive medicine along these lines; and, more than most subjects, it lends itself to practical illustration. Bacteriological technique as usually taught is of the least importance, but mutual tuberculin testing and cultures from the canteen crockery will profitably relieve the tedium of the professorial voice. If any subject must be sacrificed to make room for this, we would suggest the lectures now designated "hygiene": bills of mortality and hoppers, short or long, have little place in the busy doctor's thoughts. Lastly, the place of bacteriology in the diagnosis and treatment of disease must somehow be integrated in clinical teaching. In some textbooks the sections on, say, the diagnosis of typhoid fever suggest that this improvement is overdue. Nevertheless the patient is still a sick person, and it is no part of the bacteriologist's duties to usurp the functions of the physician. Laboratory findings, like X rays, are no more than specialised physical signs, and the absorption of such aids to diagnosis into the curriculum involves every department of a medical school.

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[1] *St. Mary's Hosp. Gaz.* 1949, 55, 35.

We doubt whether Professor CRUICKSHANK will claim any great originality for these views. Similar opinions have for some years been common gossip among those who teach bacteriology, but it was high time that they were put on paper clearly and publicly. We foresee three main grounds of objection. First, there is a feeling that the unashamed abandonment of "pure science" in favour of its applications is a sacrifice to Mammon. Yet we do not believe that imperfect knowledge of the bacterial capsule is more reprehensible in the physician than ignorance of radiological optics; the medical education is a technical one in which all possible use should be made of the scientific method, but this should not preclude the gleaning of useful information from any credible source. The second objection may well be that the newly qualified student will know no bacteriology. But this is a science that has passed far beyond the standard of the M.B. examination, and he who would spend his days as a gram-stained wretch will be the better for his house-appointments and the serious study of bacteriology as a postgraduate subject. "The examiners" summarises the last objection, which is one that has been raised to every change in methods of teaching. The examiner's first care is to ensure that the successful candidate is fit to practise medicine; if he does not know how to immunise a child against diphtheria he had better wait for three months.

Status of Pharmacology

In no period of medical history has knowledge of drugs advanced so rapidly as in the last quarter century; and the present phenomenal rate of progress shows no sign of abating. One result of the enormous increase in the potent drugs available to the physician has been a healthy tendency to regard diagnosis no longer as an end in itself but as the necessary preliminary to treatment. But there is some danger of a new therapeutic nihilism arising from disappointment or even disaster following the use of these newer remedies. All active drugs may be either ineffective or dangerous if incorrectly used, and the fine new weapons which science has given us can often become lethal in the hands of the ignorant. Pharmacological principles must be thoroughly understood if the modern drugs are to be applied rationally and effectively and if the results of therapy and the claims made for new drugs are to be intelligently assessed. Practical therapeutics, which involves much more than the use of drugs, must be taught mainly by the clinician at the bedside, but the teaching of pharmacotherapeutics will fail if it is not superimposed on a sound knowledge of modern pharmacology. It is the function of the pharmacologist to provide this basic knowledge. A medical man will be learning the use of drugs all his life but the pharmacological laboratory affords him his only formal opportunity to essential facts concerning the actions and of action of drugs and the principles them, and such knowledge becomes more every year.

England is behind most other leading co the attention given to pharmacology in the curriculum and in the staffing and facilities it by most universities. In Germany and the States it has long enjoyed independent sta extensive and well-equipped institutes—on page Dr. DERMOT TAYLOR shows how generou provisions for pharmacological teaching in universities. In England teaching and r pharmacology have too often been regarded activities of the physiology department and i to autonomy have been stoutly resisted, c physiologists. In the last few years, however, outside London has been rapid. By the of the forthcoming session all but one of the provincial university medical schools will independent department and chair in phar or in pharmacology and therapeutics, thus these schools into line, after many years, Scottish universities. London itself is slow to pharmacology as a major subject. There chairs of pharmacology in the university, one of these, at University College, is in a de training medical students. In only three of nine preclinical schools is the pharmacolog ment independent. In one of the remaining included in the department of therapeutics, five it is still a subdepartment of physiolog representation on the academic board of the school. Some recent appointments to re have been a step in the right direction. Bu ships are not enough. If young men are to b aged to take up pharmacology as a car professorial appointments should be made delay. The University of London should whether the time has now come to found chai schools where the work and ability of the pre of the department warrants it; to separate cology entirely from physiology in thos where this has not yet been done; and to a policy whereby, at the end of, say, a five-ye pharmacology in all the London schools w equality of status with the other medical sc

The present scarcity of pharmacologists hinder these developments, for recruitme subject will be encouraged by an increas senior posts—in fact, this is the only way the growing competitive demand for pharm Industry alone would gladly absorb more whole present supply of trained men. N difficulties of accommodation stand in Apart from minimum space requirements for the accommodation for teaching can usually with other departments pending the pro independent teaching laboratories.

More time as well as better facilities are if the medical student is to acquire the safe of knowledge which will prevent him from danger to the community. Time should be cutting out the obsolete, the obsolescent, unduly recondite in other subjects and in p logy itself. It is human pharmacology that nce to the medical student, and it is doubtful extensive practical courses involving complex experiments, such as are in favour in the States, would give him an appreciation of cological facts and principles commensurate eir cost in effort and money. Much of the of such courses can be more effectively dealt demonstrations. Many of the basic principles action, and much of the detail and of the methodology of pharmacology can and should trated by experiments on man and will then interest of the student as animal experi- seldom do. In research, too, there is much to e in human pharmacology and in applying to quantitative methods which have proved their n general pharmacology and for the develop- of which British pharmacologists were largely sible. This is work for which medical schools uliarly suited. Where man is the chief object ly pharmacology is likely to be taught as a immediately applicable to him and to the ns of practical medicine, the pharmacologist e clinician will meet on an equal footing, and ration in teaching and in research will become der of the day. This desirable state of affairs ome about exceptionally in spite of difficulties, cannot become general until pharmacology is the status it now deserves.

TOO MANY COURSES ?

ER the end of the war the needs of medical officers ilised from the Forces were met mainly by the offer ss-1 hospital posts for those going into general e and of class-3 posts for those aiming to become tants. But there was a considerable demand e the regular demobilisation scheme for post- ate instruction which would help in obtaining l diplomas in such subjects as public health, rial health, radiology, and anæsthetics. Unfortun- the controversy over the new health scheme bred minds of many the idea that they must at all avoid entering general practice; the possession of oma seemed a passport to a specialist or consultant Candidates for the higher diplomas of M.R.C.P. or S. came principally from those holding class-3 posts istrars, whose numbers had been greatly swollen by eation of "supernumerary" posts. Many, however ot desire a hospital post and believed that a diploma ne specialty could be obtained with less effort and d an easier way of escape. An officer who expressed ire to work for a diploma in radiology was offered ss-1 post and was almost automatically promoted ss 3 after six months even though his knowledge of es might be meagre. A course in public health did equire residence, and a substantial grant could be ned from the Ministry of Labour.

iversities responded to the demand by establishing postgraduate courses or reviving those that had in abeyance during the war; for the session 1948–49 70 special courses were offered in fourteen university es. These universities are now faced with a con- able drop in the number of applicants. The future ublic health and industrial health is obscure and at not financially attractive, while in other e immediate post-war vacancies have been and the number of future appointments on ital staffs, though uncertain, is likely to be less than anticipated. Thus the number of candidates for omas is returning to normal and represents those are genuinely keen on this type of work. Clearly the number of postgraduate courses is in excess of demand. For some courses there have been no applicants, while for others only four or five students have entered. A glance at the list of special courses on p. 391 reveals their multiplicity. A good case could be made out for concentrating instruction by common agreement in a few centres that have special resources such as whole-time teachers. University authorities are apt to view with disfavour postgraduate courses that do not pay their way: but they may be reluctant to give up such postgraduate teaching, which they naturally wish to provide for their past students, who in turn find it less expensive to attend courses near their homes. But the multiplication of courses also causes great waste of time and energy. Instruction for one diploma may require the services of five or six lecturers, who are disheartened when, after much preparation, they meet a class of only a few students. The problem is more acute in provincial universities than in London, where there are postgraduate schools and institutes separate from the undergraduate teaching schools and where numerous attractions can be found for the hours of leisure.

The large and efficient provincial medical schools, with their rich clinical material, facilities for research, great preclinical departments, and close contact with the science faculties, may well decide that their real place and finest work in the postgraduate field is in training and encouraging students of promise who have been selected as trainee consultants. The whole-time clinical professors and their colleagues have very great responsibilities in providing the consultants of the future, and, through their contacts with the other hospitals in their regions, maintaining the highest standards of practice and research. Except in some selected centres with whole-time staffs or special institutes, instruction for certain diplomas (the diploma in clinical pathology is a good example) and refresher courses for general practitioners might well be left, under the guidance of the university directors of graduate studies, to the large so-called non-teaching hospitals, whose staffs have already shown themselves keen and competent to undertake postgraduate training of this sort.

B.C.G. FOR STUDENTS AND NURSES

TWO years ago the Tuberculosis Association, acting with the Joint Tuberculosis Council and the National Association for the Prevention of Tuberculosis, submitted a memorandum[1] to the Minister of Health appealing for a trial of B.C.G. vaccination on selected groups. This suggestion was accepted, and a letter lately received from the Ministry (and the Department of Health for Scotland) by hospital authorities suggests that action will not be delayed much longer. In Norway, which with other Scandinavian countries has done much of the work on which the case for B.C.G. rests, compulsory vaccination of certain groups has been willingly accepted.[2] Here vaccination is to be voluntary, those who refuse it being considered as controls. The Ministry proposes that the vaccine—which is to be imported from Denmark—should first be offered to medical students and nurses who are found to be negative to a tuberculin (preferably Mantoux) test. Specialists will be able to obtain supplies for individual contacts with known cases of tuberculosis, and others exposed to special risk, but the general public are not yet included in the scheme. Elsewhere the vaccine devised by Calmette and Guérin has been used extensively for twenty-five years, and its more impatient advocates will find sardonic amusement in the Ministry's statement that "no certain claims can yet be made for this form of immunisation under conditions here, but it is now considered to warrant trial."

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1. *Lancet*, 1946, ii, 138.
2. *Ibid*, 1948, i, 297.

Points of View

THE DOCTOR'S PROFESSION*

4. Medical Education

If the previous argument holds, it is clear that the education which the doctor receives is of the utmost importance and ought to be more adequate in at least two directions. First, the medical student needs a much clearer understanding of his task in relation to the general life of society around him than he has ever had in the past. Secondly, he should be helped to obtain some criteria by which to make judgments upon the ethical problems which confront him in his work, some training in how to handle and direct responsibly the increasing powers over life and death which are placed in his hands, and, above all, an approach to his studies which makes him begin by considering patients *not as laboratory specimens but as living individuals.*

THE SOCIAL OUTLOOK

The first need is increasingly widely recognised today. The development of the study of social medicine and the prolonged discussion of the establishment of a State medical service have both prompted the medical profession to think more seriously than ever before about its relation to society. At the same time, this new awareness is not yet very clearly reflected in the method of medical training. The strong recommendations of the Goodenough report[1] on the subject of social medicine, like those of previous official reports to which it refers, are still more in the nature of pious aspirations than of definite proposals which have an immediate prospect of being implemented. Such a situation is perhaps inevitable in a large and ill-defined field, and there are many encouraging signs of developing interest in the subject which will find expression in curricula before very long. What is more alarming, however, is the superficial nature as yet of so many social medical studies. While the careful and thorough researches of such workers as Prof. John Ryle of Oxford are a notable exception, social medicine as it is made available to students is still too often little more than a series of obvious generalisations culled from textbooks of popular science, geography, and sociology. Much of the suspicion doctors have of social medicine as a subject may be partly due to their philistine conservatism; but it is also partly due to a recognition that it has not yet succeeded in being much more than a means of recording what public-health work and ordinary social observation have already taken for granted. Much greater emphasis needs to be laid upon the fact that, because society and the medical profession are both living organisms, the profession's conception of its task in society should never become static. The natural tendency of the student is to assume that his task as a doctor will be the same as that of the generation before him. This tendency is strengthened by the fact that it is the honorary physician or surgeon with a large private practice who is the dominant teaching influence in the medical school. It can be kept in proportion only if a clear understanding of the changing social function of medicine affects the teaching of the whole school.

INSULATED STUDIES

It is, however, when the second set of needs is considered that the deficiencies of existing medical education become most manifest. Formal medical edu still almost entirely technical in character. It that the student may learn a great deal about the patient relationship from observation of his chi visits his patients in the wards. This practice *is such a distinctive feature of English* medical of teaching medicine at the bedside, is in itself ad The unconscious educational influence of sharin on-going life of a great institution like a teaching must also be very considerable. Whether th unreceptive type of student learns anything fro however, is left entirely to chance; and, excep rare instances where the teacher is a man of out quality, what even the good student learns is be unsystematic and undigested. We have grave dangers to which the conception of the merely as technician leads. Does present-day education do enough to help the doctor to anything but a technician?

Most medical schools are part of universit medicine is rightly proud of its title as a lear fession. The Goodenough report asserts boldly:

> "By its nature and standard the training shoul the student with a university education on broad a lines. A mere technical training will not fit a st perform his future professional work properly. have a university education if he is to enter practice with an outlook beyond the confines of a nation syllabus, with a well-disciplined mind, wid interests and an intelligence able to move with the of human knowledge."

As the report itself recognises, however, to mere title of university education to what the receives in the medical school is itself no g that these desirable gifts will be obtained. T human interests and the intelligence which is *develop with the development of knowledge* in it sidedness come only if the student is in personal both with teachers who try to see their subj the round," in relation to other branches of and to fundamental human interests, and wi students who are pursuing quite different stud similar spirit. Most medical schools are insulat by geography, as in London, or by pressure as in most other places in Britain, from effective *with other faculties of the universities of which* part. The result is that few of them know a genuine university quality. The other faculties th suffer from being over-specialised and technical approach, and often have little to offer the student in the way of a synoptic viewpoint ov he is in effective contact with them. If the to be more than a technician and to become a re person in the use of his skill, it can be done o conscious effort—an effort which involves ch the nature of medical education itself, change must be linked to a new conception of u education as a whole.[2]

THE MATERIALISTIC BIAS

For example, one of the greatest difficultie way of a medical education lies in the natur subjects studied. The nature of scientific m *such that it not only gives those who use it*—r beliefs they may formally possess—a practical favour of what is commonly termed materiali also it constantly encourages them to lose sigh distinctive nature of human personality itself mystery can never be adequately analysed by categories alone. The educational discipline of experience itself, as well as the influence of out life derived from other sources, may frequently ct this tendency, which in the nature of the evitable, and, if properly handled, need not be . Its proper handling, however, involves that ent should be warned against the dangers of n of outlook to which his continual preoccupation entific studies lays him open. Unless he strives eract these dangers he will run the risk of being doctor, because it is those aspects of human ities that are imponderable from the scientific view which are sometimes of greatest importance xercise of the healing art.

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* Four essays arising from discussions held under the auspices of The Christian Frontier Council (8, The Cloisters, Windsor Castle). For permission to print the [illegible] Student ([illegible] Street, W [illegible] others, ur [illegible] likely to a [illegible] on Medical Schools.

[1] Report of [illegible] London, 1944.

[2] See Sir Walter Moberly, *The Crisis in the University.* for the Christian Frontier Council, by the S.C. London. 1949. 15s.

uld be remembered also that if the temptations ical materialism are counteracted for the doctor fact that he necessarily has a great deal of experience and is constantly dealing with people ents of crisis in their lives, they are made more y other circumstances peculiar to the doctor's lot. ctor, like other scientific students, is brought at ressionable age into an atmosphere dominated scientific attitude, which has many virtues ry great prestige and which appears to produce ore impressive proof of its validity by its magnifi- sults. But his position is made peculiar to some by the fact that, both in the medical school erwards in practice, his life is quite exceptionally He has little time to reflect upon his experience, the only criteria he has received from medical ion for judging human experience are those ed by the scientific attitude it is not surprising e tends either to discuss all matters affecting life and destiny in terms of the narrow philosophy r among scientists, or, more commonly, to ignore ompletely in the practical atheism of an extremely xistence. It may be added that it is the testimony ny medical men that the necessity of treating t bodies with cold objectivity in post mortems perations also encourages them in a certain insen- y and lack of imagination which first arise as a e mechanism against violent assaults on their s but which often harden into habits of mind. doctors testify to the importance of this last in their own experience.

SPIRITUAL ILLITERATES

s makes the doctor ill-disposed to examine the or otherwise of the Christian faith, and makes nclined to prejudge the issue one way or the other, thrusting it aside as irrelevant or holding it in a er unrelated to his scientific experience. As one r puts it:

> A man who is a Christian must have studied and lerstood Christianity. That is to say, he must know nething of the Bible, and he must understand what is ant by the many difficult and sometimes misleading ms used. Little is left of either time or energy, from life of the science student or worker, for reflection on, study of, these things. Scientific study, induces a found 'failure of conception.' From his unfamiliarity h religious concepts, the scientist comes to have the st fantastic ideas about what Christians mean by, for ample, 'God,' or 'prayer.' It is little wonder that he uses to believe in them."[3]

is a fact of grave concern to Christians, but it should f concern to others also, because it means that this ession, which holds such great powers in its hands, a constant danger of being imperfectly educated ss it makes strenuous efforts to overcome the erfection of the very discipline which it has itself eloped in recent times as a means of education.

e have emphasised that the beneficent development application of medical knowledge and skill, in trast to many other forms of science, are not an accident but have been possible because they have been handed on in a great moral and educational tradition, where certain standards of right and wrong in relation to the proper handling of human beings, which were the more powerful for being only semi-consciously held, were accepted and enforced by a strong public opinion. That moral and educational tradition is still strong, despite what the Nazis and others have done; but it is sharply challenged and quietly undermined within the profession, and the standards of public opinion have become equivocal. So far from the public demanding a certain moral and intellectual standard from the profession, it frequently looks anxiously to the profession for a lead and is sharply critical of it if it does not provide one. In such a situation, with medical knowledge, power, and prestige still growing rapidly, we dare not have doctors who are spiritual illiterates or moral savages, any more than we can have doctors who are quacks or charlatans.

The suggestions which follow do not claim to be either original or exhaustive. Also they are very generalised and will not apply with equal force in all situations. Yet they do indicate some of the places where Christians who are anxious to maintain and develop the great traditions of medicine can throw in their influence with particular confidence.

A GENERAL EDUCATION

First, it is a matter of urgent necessity that the medical student should receive a much better general education than he often does at present. How this is to be accomplished is a technical question of great complexity, involving a reconsideration of, among other things, the school examination system. It seems clear, however, that it is bad for the medical student to specialise in scientific studies closely related to medicine quite so early in his schoolboy career as he is normally expected to. Many would argue in favour of abolishing the arrangement by which the first M.B. examination can be taken in school, and of lightening the preclinical course to allow the student to look around and assimilate more of what the wider life of the university has to offer him.[4] In particular, many doctors complain that the loading of the student's memory with a mass of detailed information about such subjects as botany and zoology prevents him from receiving training in that synoptic approach to his studies which is peculiarly important for the doctor. They would cordially support the categorical statement of the Goodenough report that "throughout the course the main emphasis should be on the inculcation of fundamental principles and methods, rather than on the implanting of a mass of purely factual knowledge, much of which the student will soon forget" and that a ruthless pruning of the curriculum is urgently necessary. This can be done without seriously weakening the quality of the factual discipline provided by medical training.

One practicable arrangement, which has obtained for a very long time in the Scottish universities, is to offer a combined degree in arts and medicine, which is so organised as to enable the student to complete it in a shorter time than if he read for both degrees separately. Alternatively, as the Goodenough report suggests, special inducements should be offered to students who *have already graduated in other fields to study medicine.* Obviously it would be impossible for more than a small minority of students to undertake such courses, but even if as few as 1% of doctors did so—and presumably they would be among the abler students who would be likely to arrive at positions of leadership in the profession—it might make a great deal of difference to the whole tone of the profession's work and set the unmistakable stamp of a genuinely learned profession upon its work.

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[3] Paton, W. Supplement to *Christian News Letter*, No. 195. Nov. 17, 1943.

[4] The B.M.A. report, entitled The Training of a Doctor (London, 1948), has many useful and practical suggestions to make on this point.

CONTACTS

Secondly, the medical student needs active encouragement to make closer contact with the members of other faculties in the university. Medicine is an absorbing subject, and the average medical student suffers little from the apathy which affects students in other faculties. Medical "shop" is the most fascinating form of "shop," and medical students find it notoriously difficult to talk about anything but their own medical experience. To live with and to share in the interests of other students is a great safeguard against the dangers of this, as well as being of great benefit to the other students.

The measure of contact medical students have with members of other faculties varies considerably from university to university. In Oxford, it is very close. In places like Edinburgh and Birmingham it can be fairly close if the student takes advantage of the opportunities open to him. In the London medical schools, with the partial exceptions of University College and King's, it is generally non-existent. It is hard to see how medical education can claim to be university education when the student is deprived of one of the primary requisites of such education—intellectual and social coöperation with scholars pursuing different studies. This is a serious enough state of affairs on the undergraduate level. What is even more alarming is the fact that often such coöperation does not exist on the professional level either. In London, for example, most members of the staff of medical schools never have occasion to meet other teachers in the university at all.

THE PARTS AND THE WHOLE

Thirdly, students should be trained to see their subject as a complete unity, with the relation of its different parts to each other and to other branches of knowledge defined. Even the first of these is often not properly done, partly owing to the growth of specialisation. "The bearing of anatomy and physiology and the other basic sciences on clinical studies has been obscured, while the latter have tended to be conducted in watertight compartments, frequently in a more or less haphazard order," says the Goodenough report. The second has hardly been attempted at all. Yet the relation between medicine and the physical and biological sciences, anthropology and sociology and geography and psychology, philosophy and theology, is clearly of the greatest importance, and can hardly be indefinitely neglected if medicine is to retain its right to be considered a learned profession.

MORAL ISSUES

Fourthly, medical students should receive much more systematic and responsible guidance than they receive at present about how to deal with the familiar moral issues which arise so frequently in connexion with their work. This is not necessarily to claim that Christian views, in so far as they are well defined on such matters as euthanasia, abortion, and artificial insemination, should be taught to students as authoritative. But it is to claim that students should be made familiar with these views, in lectures at least as carefully prepared as any others that they receive, and encouraged in the responsible and critical discussion of them. Christian medical teachers, whose number is far from negligible, have a special responsibility to see that this is done. To say that it is inappropriate that these controversial issues should have a place in the medical curriculum is simply to say that the medical school is unable to provide a comprehensive preparation for medical practice, since these issues constantly arise in practice. The same holds with ever-increasing force in modern society of the teaching of the ethics of certification.

THE SENSE OF VOCATION

Fifthly, and above all, medical education sho to inspire those who undertake it with a sense of vocation and of belonging to a great professio high standards of public service and personal in which it is the specific duty of each doctor to end to maintain. This is especially true in these days, students often come forward for training with motives and a more highly developed sense of privileges than of their responsibilities. Here, of the personal influence of the teacher is the most im factor, especially on the clinical side, and the respo of teachers in these matters cannot be overemp Not least important in a comparatively lucrativ fession such as medicine is the necessity to students of the snare of wealth. What Prof. Polanyi has said to scientists in general has its p application to doctors: "The success of a man is measured by the amount of money he The success of a scientist should be measured amount of money he refuses to earn."[5] In th nexion it is important that medical schools the and not merely the small religious groups most int should remind students of the possibilities of in and the contribution to medicine made by missions.

With modifications and developments along suc a medical education could become what, at its is not far from becoming even now, one of the forms of general education that are availabl along with its existing virtues, it can provide a cultural background, a stronger sense of soci personal responsibility, and a training in deeper sensitivity, it will indeed be equipped to pro generation of doctors who will be more clearly th among the most useful of all servants of humanit

Public Health

Poliomyelitis

In the week ended Aug. 13 notifications in Engl Wales were: poliomyelitis 236 (164), polioencep (22). Figures for the previous week are shown in pare Notifications in the corresponding week of 1947 were myelitis 568, polioencephalitis 56.

Counties with multiple cases (poliomyelitis an encephalitis together) were: London 30 (31), Bedfo Berkshire 2 (3), Buckingham 2 (1), Cambridge 2 (0), 3 (3), Cornwall 6 (9), Devon 9 (6), Dorset 2 (1), Durha Essex 19 (7), Gloucester 7 (5), Hereford 4 (0), Ke Lancs 23 (12), Leicester 4 (5), Middlesex 10 (15), Norf Northampton 2 (0), Northumberland 4 (1), Nottingha Somerset 4 (2), Southampton 13 (9), Stafford 4 (2) 7 (7), East Sussex 5 (2), West Sussex 4 (2), Warwic Wiltshire 2 (2), Yorks, East Riding 2 (2), Yorks, West 34 (17), Glamorgan 3 (5), Monmouth 4 (2).

India Decides on Opium Prohibition

At a conference of provincial and State excise minist in Delhi early in August, Dr. Matthai, Indian finance stated that the policy of the central government was re of local consumption of opium to scientific and medi poses and prohibition of oral consumption of the r and of opium smoking. The meeting was conv formulate plans to reduce cultivation, production, an of the drug. It decided on total prohibition of opiu Indian Union in the next ten years except for purposes. Every year from now on there will be a con reduction by 10% of provincial and State requiren opium, based not on demand but on the minimum necessary to meet the needs of addicts and for medi A census of addicts is to be taken soon in each consumi It is also proposed to reduce the supply to addicts annually so that at the end of the decade oral cons will be virtually wiped out.

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[5] Quoted in *Manchester Guardian*, May 5, 1947.

Students Guide

9 1950

Medical Schools

XFORD UNIVERSITY the number of new students cted by decree; and the number for the coming as been fixed, as it was last year, at 55 men women. Ex-Service men and women are only ed over and above these numbers if they were efore Jan. 1. 1929. The various colleges put l the names of the students they wish to be ed to the medical school, and preliminary accep- *y a college is essential for any prospective medical* . All students entering the school in the future required to take the second public examination re the war; the course normally taken to satisfy gulation is the final honour school of animal logy, which takes up one year after passing the ay and physiology examination for the B.M. degree. tablishment of a clinical school in Oxford enables ts to qualify at the Radcliffe Infirmary as an tive to transferring to a teaching hospital in n or elsewhere. A students' club has been opened er House, in the Infirmary grounds, which gives and reading facilities, and sleeping accommoda- or those on duty in the hospital. This social. istrative, and teaching centre will be completed lecture-room and a class-room which are soon constructed in an adjoining building, and by the ion of sporting facilities for students in the medical

he UNIVERSITY OF CAMBRIDGE the most important concern the further development of the depart- of human ecology in which a chair is to be ished from next October. There is also a good ect of an early start on the erection of a permanent ng for the department. It is hoped that the ng will be sited on Fenner's ground and that it e combined with a gymnasium suitable not only killed gymnasts but also for remedial exercises. in the atmosphere of healthy athletic activity. ced from hospital surroundings, the university h service will have full scope. This service has in full operation during the past year and has d out some 3700 X-ray examinations and 1700 al examinations on volunteers from among under- ates *and the staff of the university. The mass-* graphy apparatus and team have been kindly d by the East Anglian regional hospital board. results have been such as to suggest that at least y examination should be made compulsory. The rtment of human ecology is also interested in the lopment within the teaching hospital of a home and nursing service, with which will naturally be d the study of the problems of the aged and infirm monym for the unpleasing word geriatrics is under ideration). The reader in human ecology has been ged in epidemiological studies, and in cooperation the county medical officer of health has been to make a preliminary analysis of the distribution nfectious diseases in schools in the county. The ersity department of radiotherapeutics has pursued arch designed to improve the treatment of cancer allied diseases by the combined use of radiotherapy chemotherapeutic agents; the department expects have a 30 M.e.V synchrotron installed in the near re. The department of experimental medicine has ied out studies on various aspects of undernutrition—bly œdema, renal function, and skin conditions. h of the work has been conducted in Germany. staff of Addenbrooke's Hospital, which has been ngthened by the election of a thoracic surgeon and ediatrician, now regularly give courses of instruction various special subjects for postgraduates, including eral practitioners. The long vacation course in nentary clinical methods for undergraduates has n completely reorganised to cover adequately the rmediate period between preclinical and clinical k in accordance with the recommendations of the neral Medical Council. Undergraduates also have the opportunity of attending an introductory course in psychology during the last long vacation term of their residence.

London Schools

LONDON UNIVERSITY bears a different relation to its medical faculty from other universities: whereas they have one school of medicine each, London has twelve autonomous schools, each of which is closely linked with one of the teaching hospitals, as well as University, King's, and Queen Mary Colleges, all of which take medical students for some part of the preclinical course. All the medical schools are now open to men and women students.

The preclinical course at UNIVERSITY COLLEGE is based on the belief that medical and dental students are best prepared for their future life by education of a university type. This principle is being put into practice by introducing various courses and classes whose aim is to provide an understanding of scientific and logical method and practice in the use of these. Experience shows that students do not learn these things unless they are specially taught how to do so, and the faculty is very conscious of the need for defining the aims of preclinical studies and investigating the methods of achieving them.

KING'S COLLEGE has in its medical faculty one of the largest schools for preclinical studies in London. Its members share fully in the social and athletic activities of students from all six faculties of the college. Clinical studies are pursued at King's College Hospital, St. George's, or Westminster. Arrangements are made by which patients attend the college for clinical demonstrations in applied physiology given by clinicians. Hostel accommodation for a limited number of men is available at King's College Hall, Champion Hill, S.E.5.

The arrangements made by the joint committee of QUEEN MARY COLLEGE and the London Hospital Medical College are working efficiently; and now that Queen Mary College holds its own special internal first examination for medical degrees the teaching subcommittee has organised the instruction in physics, chemistry, and biology to fit in closely with preclinical teaching. All available places are taken by London Hospital men and women; during the 1948–49 session 76 first medical and 12 premedical (Conjoint) students passed through the departments.

UNIVERSITY COLLEGE HOSPITAL and UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL are gradually settling down under the new system of dual control. It is often felt, however, that some less formal machinery should exist for coöperation between the teachers in the school and those in charge of patients in the hospital, considering that they are often the same people. Students are beginning to benefit from the facilities of the St. Pancras "wing"; they find valuable clinical material among the aged and chronic sick and are now attending regular demonstrations in the mental observation unit. The London Hospital for Tropical Medicine is now an integral part of the U.C.H. group, so postgraduate clinical teaching in tropical medicine will be included in the group's activities.

The Medical College of ST. BARTHOLOMEW'S HOSPITAL is steadily recovering from the disorganisation caused by the war. The selection of new students from the very large number of candidates has in itself become a major problem. To increase the entry would lead to overcrowding; and much time has to be spent in interviewing the many hundreds from whom each year no more than 100 students can be chosen. This work is done by a committee, which considers the new entry one year in advance and completes the main part of its work between October and February. With each advance in science the undergraduate curriculum tends to become more and more congested. Recent attempts at simplification have met with some success. In the preclinical years the institution of internal university examinations has gone some way to prevent the students' work becoming *too diffuse. By a firm allocation of the major part of the* clinical students' time to general medicine and surgery, it has been possible to ensure that the many exacting and rapidly developing branches of medicine do not so encroach on their limited time that the wood is obscured by the trees. The effort to ensure that the very large numbers of undergraduate students do not get lost in the thickets of modern medicine and its applied sciences leaves little time to give formal teaching to postgraduates; nor does the college attempt this on a major scale. A course for the final fellowship is held twice a year and is limited to 25 students. A course for the primary fellowship is held at similar intervals.

The new extensions to the school at CHARING CROSS HOSPITAL have now been in use for two years; they are providing most satisfactorily for the preclinical students. Last March, for the first time, an internal second M.B. examination was held in the school and the results were most gratifying; of the 44 candidates, 38 satisfied the examiners in anatomy and physiology and were able to begin the introductory clinical course in April. The facilities of the school and hospital are practically restricted to undergraduate students. The only postgraduate training provided is for old students returned from National Service who are working for higher qualifications, and in the radiology department where three students are admitted each year for part 2 of the D.M.R. or D.M.R.-D. courses. The plans for the new hospital and medical school to be built on the Northwick Park site at Harrow have now been submitted to the Ministry of Health and to the university.

ST. GEORGE'S HOSPITAL, with 130 clinical students, is one of the smaller schools. The firms are small; the number in each is approximately 8. Women have been accepted for training since 1945; they have done extremely well. The principal factor limiting intake is the size of the pathology laboratory, which can accept at the most 40 students. The new midwifery department has a large enough turnover to provide all the cases needed by undergraduates. Introductory courses to link anatomy and physiology with clinical work are held; these include instruction in methods of examination, and emphasis is placed on the normal and variations in the normal.

At GUY'S HOSPITAL Medical School the aim has always been to encourage students to accept responsibility as early as possible, rather than to spoon-feed with too much organised teaching. There are, however, lectures and demonstrations organised by the directors of the departments of surgery, medicine, obstetrics, pædiatrics, and anæsthetics in order to cover the whole curriculum. The object is to make good doctors rather than good examination candidates. There is a full range of house-appointments for which students may apply when they qualify, and every encouragement is given to men of promise to obtain the higher degrees and diplomas. House officers, and students during selected weeks of their course, live in the college; and there are two hostels where a limited number of senior students can live near the hospital. It is a condition of entry to the medical school that students should join the clubs' union which covers all athletic and intellectual activities and includes membership of the students' club.

KING'S COLLEGE HOSPITAL Medical School provides the clinical training for men and women students reading for the medical degrees of the Universities of Oxford, Cambridge, and London. The preclinical course for students reading for the University of London degrees of bachelor of medicine and bachelor of surgery is taken in the faculty of medical science at King's College, Strand, where students are admitted once a year, in October, and have the advantage of working for the first two to three years of the course in association with students of all university faculties. Students are admitted for clinical training twice a year, in April and October. The medical curriculum is at present being revised, and will in future include the teaching of psychological medicine and certain special subjects such as orthopædics and urology during the first twelve of the clinical course. Three months will be entirely to the study of pædiatrics, including 14 *residence at the Belgrave Hospital for Children* sion course will be held twice a year immediately p the M.B., B.S. examinations. The museum re-catalogued and many of the specimens re New teaching specimens are regularly being special feature is being made of post-mortem de tions, and the post-mortem department ha re-equipped to provide for this. Library facilit been increased, and provision has been made undergraduate and postgraduate work. An weekend postgraduate course, open to former of the school and to local medical practitioners annually in October.

Apart from instruction in tuberculosis and m all teaching at the LONDON HOSPITAL is cent the hospital itself. The tutorial system by whi student is allocated to one of the first assista acts as his tutor, is working satisfactorily. Tl ductory course, designed to help students in the t from preclinical to clinical studies, continues a great success. By a system introduced during year, all students are on duty in the wards weeks during their clinical training. This "bac patient" movement has so far succeeded ve Students are on duty for five hours on ordinary w and three hours on Saturdays, choosing their ow to fit in with their lectures and the requiremen ward in which they are working.

At ST. MARY'S HOSPITAL Medical School a biochemistry has been instituted. In view of the i number of students and in order to strengthe graduate teaching, readerships are being estab anatomy, physiology, pharmacology, and bact For the second year, a certain number of stud have passed their 2nd M.B. examination ha selected to take a special honours B.SC. degree in or physiology before commencing their clinical A revised course of clinical lectures lasting t has been introduced. It is expected that this wi assist the clinical students to cover the systematically. All students who have attaine ciently high standard in their final examina given special opportunities of studying for highe and diplomas. In order to encourage original w postgraduate research fellowships are awarded During the past year new research laborator been equipped in the biochemistry department medical unit. A new common-room for women a new kitchen for the students' restaurant, and graphic department for the use of the medic and hospital have been opened.

The MIDDLESEX HOSPITAL has now been fully for more than a year, and in fact there are n beds for teaching than before the war. Faci instruction in the clinical period are enhanced the majority of students being attached to the Middlesex Hospital, Willesden, for at least three instruction. Two improvements in the clinica have been recently introduced. Students no three weeks' resident instruction in infectious at the North Eastern Hospital; and sti recently students have been enabled to visit Hospital for instruction in pulmonary tubercul *important step forward* has been taken by the in increasing the number of registrars. This mo more men can receive postgraduate instructio view to becoming consultants or specialists.

The ROYAL FREE HOSPITAL School of Me now a coeducational school, and accepts betw and 500 students. There will be no entrance exa for the 1950–51 session, and candidates will be by an interviewing committee. An arrangem recently been made for the sharing of social an tional clubs between the students' union of th and the students' union of Guy's Hospital Medica A new wing, to include additional laboratories, rooms, cloak-rooms, &c., is being added to th building in Hunter Street to accommodate the i

s. Clinical teaching is given throughout the ls associated with the Royal Free Hospital group, as over 700 teaching beds.

ng the past year ST. THOMAS'S HOSPITAL Medical has become a corporate body. Good progress ery from the chaos of war has continued, and much ruction has been accomplished. Laboratory as been increased by the utilisation of basements, new photographic unit opened, The hospital has er 500 beds open apart from others available in ated hospitals. With the opening of a new tempor- partment, outpatient teaching is conducted under improved conditions. The chairs of anatomy edicine have been filled by new appointments, and lership in therapeutics established. The final course has proved its worth both to old Thomas's nd to candidates from the Dominions. This at t affords the only postgraduate teaching for outside nts; the number of beds is insufficient for both aduate instruction and a full undergraduate . A very successful series of clinico-pathological ngs, on the lines of those held at the Massachusetts al Hospital, has taken place with many well-known ans as guest speakers. The new metabolic research s nearing completion, and this year the school has over the direction of all clinical pathology in the al. Student life is thriving in a wide field of ties, with outstanding victories in sailing, squash ts, and bridge. It is hoped that the new athletic d at Cobham will help to bring success in other of sport.

has been agreed that the WEST LONDON HOSPITAL al School shall join the British Postgraduate al Federation as soon as it is in a position to accept graduate students for training as medical and cal specialists. The school is not taking any more rgraduate students, the last entry having been in ber, 1948, and probably the first postgraduate ents will be admitted in January, 1950. Since the ol is to fulfil its obligations to all its present under- uate students, it will not be able to devote its full irces to postgraduate teaching until 1952. The ils of the postgraduate training have not yet been ed out: but it is known that the university requires hool for the training of general physicians and general eons, and this work will be allocated to the West don Hospital Medical School. As far as possible, the ing will involve practical work in the wards and atient department, and in the early stages of training students will be attached to the physicians and eons as medical and surgical "firms," with duties lar to those at present carried out by undergraduate lents.

his year the WESTMINSTER MEDICAL SCHOOL has brated its centenary. All old students were invited elebrations extending over three days and including ief course of postgraduate lectures given by members the staffs of the Westminster group of hospitals. s year, too, an F.R.C.S. course is to be held for the time at Westminster and the designated hospitals. course—one of eight weeks beginning on Sept. 6— imited to 20 postgraduate students. The number undergraduate students has mounted steadily to the sent total of 140, and the problem of selection from enormous number of applications is becoming reasingly difficult. The clinical facilities at the ignated hospitals make it possible for an increasing ount of instruction to be given outside Westminster spital itself and thus to deal more easily with the wing number of undergraduates. Students on general ns already attend All Saints' Urological Centre; the diatric firm is at Westminster Children's Hospital, d a new surgical firm will shortly be formed to work the Gordon Hospital. The teaching of psychiatry s been reorganised. There is a resident course on ectious diseases at the Western Hospital. A fort- ght's resident course for final-year students has been stituted at King Edward VII Sanatorium, Midhurst, ere the students attend in groups of four. Only in e teaching of pathology has the problem of over- owding arisen, and this has been solved by spreading instruction in that subject over a longer period of the clinical course. The school has recently acquired a new sports ground at St. Ebba's Mental Hospital, Epsom.

At the SCHOOL OF DENTAL SURGERY of the ROYAL DENTAL HOSPITAL of London, the curriculum for the first two years includes the study of dental mechanics, dental prosthetics, the properties of dental materials, general anatomy and physiology, and special anatomy and physiology. The anatomy and physiology courses are held at King's College in the Strand. For the second two years students attend lectures and clinics on general medicine and surgery at Charing Cross Hospital Medical School, and lectures and practice in dental surgery at the dental school.

Other English Schools

At the UNIVERSITY OF DURHAM competition for admission to the medical school has been more intense this year than at any time since the war. The vast majority of candidates have applied for admission to the second-year course, in which there will not be more than 30 vacancies. Women students are being accepted in the approximate proportion of one to every four men. This means that although there is no fixed quota for women there is nevertheless intense competition for the places available, and over-all it is estimated that this year it will be possible to admit about one candidate in ten. The university have been compelled to make drastic reductions in the number of first-year students this year, in order to ensure that next year there will be more vacancies to meet the greatly increased demand by well qualified candidates for places in the second year. It may prove necessary next year to dispense altogether with the first-year course. In undergraduate teaching the present arrangement of holding the 2nd M.B. examinations in anatomy and physiology as separate parts is to be discontinued. In 1951 there will be a return to the system whereby the examinations in anatomy and physiology are taken together after five terms' work, to form part I of the 2nd M.B. examination. A rearrangement of the final examination will also take place in 1950–51. Surgery is to be taken in part II of the final examination in June of the final year, in company with medicine and pædiatrics. Midwifery and gynæcology remain as part I of the examination taken in the previous December.

At the UNIVERSITY OF BIRMINGHAM * the increased number of students has enforced duplication of practical classes in the preclinical years. This has caused further embarrassment to the depleted staff. The experiment of teaching anatomy and physiology as an integrated subject continues to attract great attention and has earned the congratulations of other medical schools. The innovation of encouraging honours B.SC. students to carry out original investigations as they extend their knowledge of the basic subjects has also proved a success, and substantial contributions to research have already been made by this means. The anatomical and dental museums are being reconstructed so that self-explanatory demonstrations may be presented to students from time to time. By a redistribution of space, greatly increased accommodation has been provided for the teaching of surface anatomy. The building of the experimental anatomical research laboratory is proceeding slowly. On the clinical side the regional hospital board has given many examples of its desire to coöperate with the university by providing members of the university teaching staff with opportunities for practice and for teaching undergraduates and postgraduates in hospitals under its authority. A standing joint committee consisting of representatives from the university, the board of governors of the teaching hospital, and the regional hospital board has been formed to ensure this close collaboration. A new departure in the department of bacteriology is the introduction of an honours (B.SC.) school which will help to meet the urgent need in

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* The entrance requirements for the Universities of Manchester, Liverpool, Leeds, Sheffield, and Birmingham are laid down in the pamphlet, *University Entrance Requirements 1951–1955,* copies of which may be obtained from the Secretary to the Joint Matriculation Board, 315, Oxford Road, Manchester, 13. The pamphlet also includes the requirements in force up to 1951. Additional faculty requirements may, however, be imposed: details can be obtained from the dean of the faculty of medicine in each university.

and it is hoped that construction will start this year. A full-time medical officer in charge of students' health has been appointed, and all first-year students are required to be medically examined. This examination consists of (*a*) general physical and clinical examination, (*b*) Mantoux test, and (*c*) chest X ray. The examination must be repeated before entering upon clinical studies.

The NATIONAL UNIVERSITY OF IRELAND has colleges in Dublin, Cork, and Galway.

At UNIVERSITY COLLEGE, DUBLIN, the number of applicants for entrance appears to be falling slightly, but the demand is still very heavy. During last year brief courses, intended for general practitioners, were held in special branches of medicine—pulmonary culosis and venereal disease. Although the a was small, the college is so convinced of the of courses of this kind that similar arrange being made for the coming year.

At UNIVERSITY COLLEGE, CORK, an entrance tion in chemistry and physics must be passed by entering for the premedical course, by a which came into force in 1948.

At UNIVERSITY COLLEGE, GALWAY, students pass the premedical examination within two starting the course; and they must pass the second medical examinations within two years of the previous examination.

Degrees and Diplomas

EXAMINING BOARDS

English, Scottish, and Irish Conjoint Boards

THE Examining Board in England of the Royal College of Physicians of London and the Royal College of Surgeons of England examines candidates for the qualifying diplomas of L.R.C.P., M.R.C.S. Candidates satisfying the board's regulations in regard to the preliminary examination in general education are eligible for admission to the premedical examination in chemistry, physics, and biology, and are required to complete the professional curriculum subsequently at a recognised medical school. New regulations, published in 1948, apply to all new entrants and certain others, and will apply to all candidates from Sept. 1, 1950. Under emergency regulations, introduced in the war, the medical course is reduced from 57 to 54 months, and candidates are admissible to the last subject of the final examination after 30 months of clinical study instead of 33. The regulation permitting a candidate to enter for one part of the final after 24 months of clinical study still holds. Some other war-time concessions are still authorised in the regulations; for example, clinical study may be undertaken at any hospital provided the dean of the candidate's school is satisfied as to the instruction available and signs the certificate of study. Other modifications will be found in the emergency regulations, copies of which, with a calendar showing the dates of examinations, may be obtained, free of charge, from the secretary to the Examining Board in England, the Examination Hall, Queen Square, London, W.C.1.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow have an arrangement by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas—designated by the letters L.R.C.P.E., L.R.C.S.E., L.R.F.P.S.G.—of all three bodies. Candidates may work for the examination of the Scottish Conjoint Board at any of the recognised medical schools of Great Britain and Ireland. The course lasts six years and includes, in addition to the preliminary examination in the natural sciences—i.e., chemistry, physics, and biology—three professional examinations: the first in anatomy and embryology, physiology, biochemistry, and biophysics; the second in pathology and bacteriology and pharmacology; and the final in medicine, surgery, midwifery, forensic medicine, and public health. Details may be had from the registrar, 18, Nicolson Street, Edinburgh.

The Conjoint Board of the Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland accepts candidates for the L.R.C.P.I. and L.M., L.R.C.S.I. and L.M. from most of the recognised medical schools at home and abroad. Full details of the regulations can be obtained from the registrar, Royal College of Surgeons in Ireland, Dublin.

Apothecaries' Licences

The Society of Apothecaries of London grants the L.M.S.S.A. Lond. to candidates who pass the primary examination (which is held quarterly) and the final examination. Final examinations are held except in September. The minimum period of is *normally five years. The four parts* of the examination may be taken together or in any Regulations and a schedule of the required co study may be obtained from the registrar, Apo Hall, Black Friars Lane, E.C.4.

The Apothecaries' Hall of Ireland grants the L.A.H. Dubl. to students who have passed the professional examinations. Intending candidates furnish evidence of having attended an approved *in practical and theoretical pharmacy.* The confers on holders the right of registration Medical Registers of Ireland and Great Britain nations are held three times yearly, in March, J November. Further information may be had registrar, 95, Merrion Square, Dublin.

UNIVERSITY DEGREES

Bachelor of Medicine and Surgery

All the universities in the United Kingdom, Nottingham and Reading, offer baccalaureate in medicine and surgery, conferred on the examination.

HIGHER QUALIFICATIONS

Those who have graduated in medicine and s at liberty to seek higher qualifications if they wish

Doctor of Medicine and Master of Surgery

Graduates holding a bachelor's degrees can t degree of doctor of medicine or master of surgery universities with medical faculties in Great Brit Ireland confer such degrees. London University the M.D. in general medicine, and in pathology, p logical medicine, midwifery and diseases of hygiene, and tropical medicine; the M.S. is obtain general surgery, and in dental surgery, ophtha and laryngology, otology, and rhinology. *At the* U sity of Durham the degree of doctor of surgery (is offered in addition to the degree of master of s (M.S.). Liverpool offers the orthopædic degre M.CH. ORTH.

Master in the Science of Obstetrics and Mast Midwifery

The Irish universities grant the degree M.A.O Society of Apothecaries of London grants the m of midwifery (M.M.S.A.) upon examination in obst pædiatrics, and public health. The examination held in May and November, and regulations ma obtained from the registrar, Apothecaries' Hall, Friars Lane, E.C.4.

MEMBERSHIP AND FELLOWSHIP

The Royal College of Physicians of London the membership (M.R.C.P.), which is obtained examination. Examinations are *held four times* in year, and medical graduates and licentiates of the over twenty-three years of age may sit for it. Detai be obtained from the Secretary, Royal Colle Physicians, Pall Mall E st, London, S.W.1. Fello

ege are elected annually at a general meeting
ollege.

Royal College of Surgeons of England grants a
ip to those passing the primary and final F.R.C.S.
tions. The primary examination is open to
ho hold a qualification registrable in the British
Register and to graduates in medicine and
of universities and medical colleges recognised
council. Subjects of the primary examination
atomy (including normal histology), applied
gy, and the principles of pathology. The final
ation can be taken in general surgery, ophthal-
or otolaryngology. To be admitted to the final
ation in general surgery candidates must produce
e of having been engaged in acquiring professional
lge for not less than three years after taking a
sed medical qualification, and of having held the
e resident surgical posts during a part of that time.
ates for the final examination in ophthalmology
aryngology must have been qualified for three
nd must have held general and specialist resident
uring an aggregate period of eighteen months.
mary examination is held in January and July;
final examination is held in May and November.
llege also grants a fellowship in dental surgery.
imary examination is open to those with a dental
ation registrable in the British Dentists Register,
graduates and diplomates in dental surgery
iversities and licensing bodies recognised by
uncil. Subjects of the primary examination are
l anatomy, and applied physiology and the
les of pathology, with special reference to the
and jaws, and of the final examination surgery,
athology and bacteriology, and dental surgery.
of the regulations and full particulars may be
ed from the examinations secretary, Examination
Queen Square, London. W.C.1.

ical graduates who have been registered, or
e for registration, for at least three years may
for examination for membership of the Royal
e of Obstetricians and Gynæcologists (M.R.C.O.G.).
ulars of the regulations may be obtained from
ecretary, Royal College of Obstetricians and
ologists, 58, Queen Anne Street, London. W.1.
fellowship (F.R.C.O.G.) is granted to members
re judged by the council to have advanced the
e and art of obstetrics and gynæcology.

duates may become members of the Royal College
ysicians of Edinburgh (M.R.C.P.E.) on passing an
nation, particulars of which may be obtained from
ecretary, 9, Queen Street, Edinburgh, 2. The
s are selected from among the members by the
il of the college, and receive the designation
P.E.

lowship of the Royal College of Surgeons of Edin-
(F.R.C.S.E.) is granted to medical graduates who
the required examinations. Under new regulations
come into force at the beginning of next year the
ination will be divided into two parts—the first
natomy and physiology and on pathology and
riology, and the second on the principles and
ice of surgery and on one of four special subjects
chosen by the candidate. Unsuccessful candidates
appeared for examination on or before March 15
ear may still elect to be examined under the existing
ations. Particulars of the regulations may be
ned from the clerk of the college, Surgeons' Hall,
icolson Street, Edinburgh.

e Royal Faculty of Physicians and Surgeons of
gow grants, after examination, a fellowship *qua*
ician and a fellowship *qua* surgeon registrable by
G.M.C. as an additional qualification (F.R.F.P.S.G.).
ission is by examination and subsequent election.
lidates for the fellowship in medicine must have
in possession of a recognised medical qualification
ot less than three years, and must have been engaged
ng one of these years in full-time clinical work in a
gnised hospital and have spent two other post-
uate years in approved medical work. The examina-
comprises a clinical examination in medicine, written and oral examinations in the principles of medicine and medical pathology, and written and oral examinations in the practice of medicine and therapeutics. Candidates for admission to the fellowship in surgery are required to possess a recognised medical qualification and to pass a primary and a final examination. The primary examination consists of written and oral examinations in anatomy, physiology, and pathology and bacteriology. For admission to the final examination candidates must have been in possession of a recognised medical qualification for not less than three years and produce evidence that they have been engaged, after qualifying, for one year in full-time clinical work in a hospital approved by the council and for a further two years in the study of surgery. The final examination comprises a clinical examination in surgery, written and oral examinations in surgical anatomy and surgical pathology, and written and oral examinations in surgery. Alternatively, candidates may submit themselves for examination in one of the following subjects: obstetrics and gynæcology, ophthalmology, or otorhinolaryngology. Details may be had from the secretary of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.

Membership of the Royal College of Physicians of Ireland (M.R.C.P.I.) is granted on the result of an examination, the details of which may be obtained from the registrar of the college, 6, Kildare Street, Dublin. Fellows are elected by ballot from among the members, and receive the designation F.R.C.P.I.

Graduates seeking the fellowship of the Royal College of Surgeons in Ireland (F.R.C.S.I.) must pass in two examinations, a primary in anatomy, physiology, and the principles of pathology, and a final in surgery. Further particulars may be obtained from the registrar, the Royal College of Surgeons in Ireland, Dublin.

The Faculty of Radiologists offers a fellowship (F.F.R.) to medical graduates of five years' standing who have spent at least one year in general clinical work at approved hospitals, hold a radiological diploma, and have practised radiology exclusively for at least two years after obtaining that diploma. Candidates are required to pass an examination and submit a thesis. Candidates who hold higher medical or surgical qualifications may be exempted from the examinations in general medicine, general surgery, or pathology. Full particulars may be obtained from the warden, the Faculty of Radiologists, 45, Lincoln's Inn Fields, London, W.C.2.

SPECIAL DEGREES AND DIPLOMAS

The regulations for the following diplomas can be obtained by applying to the examining bodies concerned.

Anæsthetics

The English and Irish Conjoint Boards offer diplomas in anæsthetics (D.A.).

Bacteriology

Diplomas in bacteriology are granted by the universities of London and Manchester.

Child Health

Diplomas in child health (D.C.H.) are granted by the National University of Ireland and the English and Irish Conjoint Boards.

Clinical Pathology

The University of London offers a diploma in clinical pathology (D.C.P.).

Industrial Medicine

The University of Edinburgh, the Royal Faculty of Physicians and Surgeons of Glasgow, the Society of Apothecaries of London, and the English Conjoint Board offer diplomas in industrial health (D.I.H.).

Laryngology and Otology

The English Conjoint Board offers a diploma (D.L.O.) for those who have made a special study of the ear, nose, pharynx, and larynx. The final examination for the F.R.C.S. may be taken in otolaryngology.

Obstetrics and Gynæcology

The Royal College of Obstetricians and Gynæcologists grants by examination a diploma (D.OBST. R.C.O.G.) to graduates with postgraduate hospital experience in general medicine or surgery and in obstetrics. The University of Dublin also offers a diploma (D.G.O.). The higher qualifications granted by the Irish universities and the Society of Apothecaries of London have already been mentioned.

Ophthalmology

The English and Irish Conjoint Boards issue a diploma in ophthalmology (D.O.M.S.). The final examination for the F.R.C.S. may be taken in ophthalmology.

Orthopædics

Liverpool University offers the degree of M.CH. ORTH.

Physical Medicine

The English Conjoint Board offers a diploma in physical medicine (D.PHYS.MED.).

Psychological Medicine

The Universities of London, Belfast, Bristol, Durham, Edinburgh, Ireland (National University), Leeds, and Manchester and the English and Irish Conjoint Boards offer diplomas in psychological medicine.

Public Health

A diploma in public health (D.P.H.) is granted by the English Conjoint Board and by all the universities of the United Kingdom, except Cambridge, Oxford, Reading, *Sheffield, and Nottingham.*

Radiology

The Faculty of Radiology grants a fellowship (F.F.R.). The universities of London, Bristol, and Edinburgh and the English Conjoint Board offer two diplomas—one in medical radiodiagnosis (D.M.R.-D.) and one in medical radiotherapy (D.M.R.-T.). Liverpool University offers a new diploma (DIP. RAD.) obtainable by examination after a two-year course on diagnosis or therapy: after a further two years diplomates may be awarded the M.RAD. by presentation of a thesis.

Tropical Medicine

A diploma in tropical medicine and hygiene (D.T.M. & H.) is granted by the University of Edinburgh, by Liverpool University jointly with the Liverpool School of Tropical Medicine, and by the English Conjoint Board.

Tuberculous Diseases

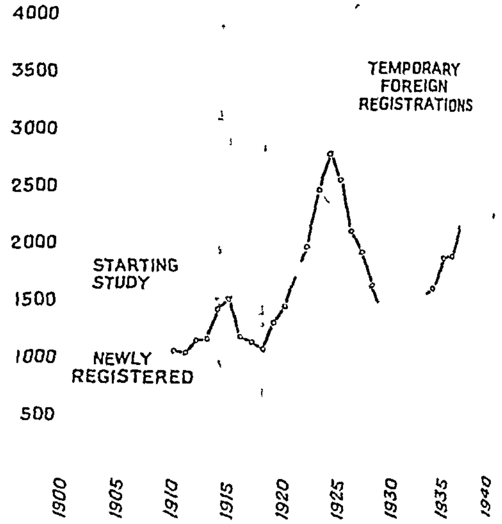
Examinations for the diploma in tuberculous diseases (T.D.D.) of the University of Wales have been resumed.

DENTAL DEGREES AND DIPLOMAS

There are schools of dentistry at the universities of London, Belfast, Birmingham, Bristol, Dublin, Durham, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Sheffield, and St. Andrews; and at the University Colleges of Dublin and Cork, in the National University of Ireland. London University offers a B.D.S. and an M.S. in dental surgery; it also prepares students for the L.D.S. of the Royal College of Surgeons. This college has lately instituted a fellowship in dental surgery (F.D.S.) which is also to be instituted by the Royal College of Surgeons of Edinburgh. St. Andrews offers a B.D.S., and Edinburgh University an L.D.S. and a B.D.S. Leeds grants an L.D.S., a baccalaureate degree (B.CH.D.), and mastership (M.CH.D.). Glasgow University and the University Colleges of Dublin and Cork grant a B.D.S. and a M.D.S., and Trinity College, Dublin, offers a B.DENT.SC. and a M.DENT.SC. All the other universities mentioned offer L.D.S., B.D.S., and M.D.S.; St. Andrews offers also a diploma in public dentistry (D.P.D.). Licences in dentistry are granted by the Royal College of Surgeons of Edinburgh, the Royal Faculty of Physicians and Surgeons of Glasgow, and the Royal College of Surgeons in Ireland. The Royal Faculty of Physicians and Surgeons confers a higher diploma in dental surgery (H.D.D.) and a diploma in orthodontics (D.D.O.).

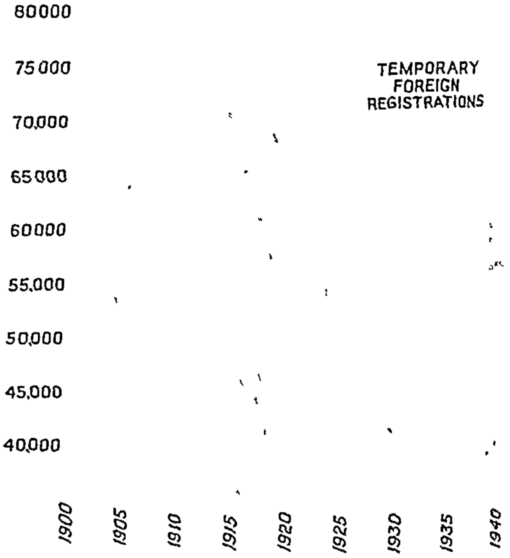
REGISTRATION

NO-ONE is a legally qualified medical practiti
his name appears on the Medical Register ke
General Council of Medical Education and Re
of the United Kingdom. The council is a sta
body, ensuring that there is a prescribed m
medical education and examination requireme
also responsible for discipline within the profe



Numbers starting study and registering.*

The approximate number of second-year
admitted to medical schools in the United Kin
in Ireland was 2498 during 1945–46, 2793 durin
2722 during 1947–48, and 2573 during 194
numbers newly registered were: in 1946, 2237
2787; and in 1948, 3968, *of whom 1396* were
to the foreign section of the register (1337
from temporary *foreign* registration). Doctors te
registered by virtue of Defence Regulation 32B
Polish Resettlement *Act have* been enabled to
admission to the *permanent* register, provided
are resident in Great Britain; and at the end of
only 84 names *remained on the* temporary foreig



Numbers on the Medical Register.

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* The numbers shown as starting study are taken from t
Students' Register up to 1938; and since then fr
made by the medical schools to the General Medic
Both forms of registration are incomplete, but latte
have been received from almost all schools.

Postgraduate Education

In London

it board has been established to effect coöperation the BRITISH POSTGRADUATE MEDICAL FEDERA- niversity of London) and the three Royal in providing postgraduate education in the and dental specialties in London, supplementing ovisions at the undergraduate medical schools ching hospitals. Each of the three Royal colleges s courses of lectures in the clinical aspects of pecialties, and the Royal College of Surgeons s, in addition, courses of lectures and demonstra- n the basic sciences for potential surgical and specialists, and in anæsthetics. Each Royal provides expert advice and guidance on suitable l appointments and programmes of study for ates for its higher qualifications and other grad- isiting this country for further study, and the s of the staff of the central office of the federation ilable to all postgraduates.

British Postgraduate Medical Federation is a of the University of London. It includes the aduate Medical School at Hammersmith Hospital, ts university departments of general medicine, surgery, and pathology. and institutes in the al clinical branches of medicine associated with ecial hospitals. In addition to the Postgraduate l School, the institutes included in the federation hose of psychiatry, neurology, child health. lmology, laryngology and otology, diseases of the cardiology. orthopædics, dermatology. urology, ics and gynæcology, and dental surgery. These various stages of development. and the numbers lents that can be admitted to the clinical practice ne of the hospitals are limited. Appointments of ouse-officer and registrar types in the hospitals nstitutes provide the most valuable form of post- ate education, and there are opportunities for ch by selected graduates. At all the institutes s of instruction are given throughout the academic they are suitable for graduates in the early of their specialist education and also for those nave completed their practical training. Two or years of hospital work in general medicine and al surgery after graduation are normally advisable commencing work in the special branches. The at the institutes is of an advanced type and ficiently comprehensive to enable graduates with le practical experience to prepare for higher es and diplomas. Emphasis is placed on clinical and atory teaching, supplemented by lectures and nstrations.

Postgraduate Medical School of London is associated the Hammersmith Hospital, Ducane Road, W.12. It niversity departments in medicine, surgery. and patho- The teaching in the clinical departments, based on work, is continuous and is supplemented by lectures g three ten-week sessions starting in January, April, and er. A course for the university diploma in clinical logy, lasting one year, is available for a limited number lected students. The department of radiology of the tal provides courses for the diplomas in medical radiology e university and the Conjoint Board. All these courses in October. Long-term and short-term tuition in thetics is provided for a small number of students.

e *Institute of Cardiology* is associated with the National t Hospital, Westmoreland Street, W.1. Seven appoint- s of the registrar type are offered each year to physicians aining as cardiologists who already have a sound ground- n general medicine. General physicians may enrol for ime or part-time instruction for one term of approxi- ly three months. There are three terms annually, mencing in January. May, and October. Three intensive ses of lectures and demonstrations, each lasting a night, are held in February, July, and November.

he *Institute of Child Health* is associated with the Hospital Sick Children, Great Ormond Street, and the Postgraduate ical School at Hammersmith Hospital; the Queen abeth Hospital for Children, Hackney, also participates in the clinical teaching of the institute. The institute provides tuition throughout the year in three terms of three months each, commencing in January, May, and September, and in addition a series of lectures by specialists and experts in various spheres is given each term.

The *Institute of Dermatology* is associated with St. John's Hospital for Diseases of the Skin, 5, Lisle Street, W.C.2. Clinical teaching takes place in the outpatient department twice daily. There are also facilities for study and tuition in the pathological laboratory, but owing to the restricted accommodation no ward instruction is possible yet. A short course of lectures is given in the summer months, and a longer and more systematic course in the winter. Clinical assistantships are arranged for more advanced students.

The *Institute of Diseases of the Chest* is associated with the Brompton Hospital, S.W.3. Students enrol for three months or more on what is at present an approximately half-time course. In special cases a whole-time programme can be arranged. Courses consist of clinical work in wards and outpatient departments, lectures, and demonstrations. There are three terms annually, commencing in January, April, and October.

The *Institute of Laryngology and Otology* is associated with the Royal National Throat, Nose, and Ear Hospital at Gray's Inn Road and Golden Square, W.C.1. A comprehensive full-time course lasting twenty weeks is held twice a year, commencing in January and July. A part-time advanced revision course lasting 10–12 weeks, suitable for students preparing for the higher qualifications, is held twice yearly, approximately from February to May and from September to November. There are a number of appointments open to students, after completion of basic training in the specialty, which give good opportunities for acquiring and extending clinical experience.

The *Institute of Neurology* is associated with the National Hospital for Nervous Diseases, Queen Square, W.C.1. The teaching is mainly by attendance on the hospital practice, and there are three terms annually. More advanced students are appointed as clinical clerks in the wards or attached to special departments and the research laboratories. Two whole-time courses in clinical neurology are held annually in the autumn and spring terms. During the summer term there is a course in neurosurgery. Two courses of weekly clinical demonstrations are held regularly.

The *Institute of Obstetrics and Gynæcology* is associated with the Queen Charlotte's Maternity Hospital, the Chelsea Hospital for Women, and the department of obstetrics and gynæcology at the Postgraduate Medical School. The teaching is based on ward work and is supplemented by lectures and demonstrations during three ten-week terms commencing in October, January, and April. Short intensive courses of a fortnight's duration, held twice a year, are suitable for students preparing for the higher qualification. A limited number of posts suitable for junior specialists receiving advanced training is available.

The *Institute of Ophthalmology* is associated with the Moorfields, Westminster and Central Eye Hospital. In addition to teaching by means of hospital practice, a routine lecture and tutorial course, lasting 4–5 months, is held twice a year commencing in March and October. Clinical teaching and lectures are given at a higher level for advanced students.

The *Institute of Orthopædics* is associated with the Royal National Orthopædic Hospital, Great Portland Street, W.1. The practice of both the central hospital and the country hospital at Stanmore is open to postgraduate students. Selected students have opportunities for taking an active part in the work of the institute and the hospital and of spending in the institute up to two years of their training. A comprehensive basic course of six months' duration is held each year, commencing in October. Twice a year, in April and September, a one-week course in advanced clinical orthopædics is held.

The *Institute of Psychiatry* is associated with the Maudsley Hospital, Denmark Hill, S.E.5, and the Bethlem Royal Hospital. Training normally covers 2–3 years after experience elsewhere in general medicine, and is based on responsible hospital duties under supervision. Regular series of lectures and demonstrations are given throughout each of the university terms; clinical training continues throughout the year and includes seminars and case discussions. Students who, because of previous experience, do not wish to take the comprehensive two-year course will be able to attend limited series of lectures and clinical instruction. There are facilities for original investigations under supervision in the clinical departments and in the psychological, neuro-anatomical, electrophysiological, and biochemical departments.

The *Institute of Urology* is associated with St. Peter's and St. Paul's Hospitals, Henrietta Street, W.C.2. Three courses of fourteen weeks' duration are held annually, commencing in January, April, and September. An intensive two-week course suitable for students taking higher examinations is held in September and March. Limited numbers of clinical assistants are appointed in January and July each year. Two courses in venereology, each lasting four months, are held annually, commencing in April and September.

The *Institute of Dental Surgery* is associated with the Eastman Dental Clinic. The object of the institute is to train dental practitioners in the special branches of preventive and therapeutic dentistry, both for children and adults, by means of clinical experience, lectures, demonstrations, and research. Opportunities for limited numbers of students are available in orthodontics, conservative dentistry, periodontia, and preventive dentistry, the courses varying from four to twelve months in duration.

It is essential for prospective students to make their arrangements well in advance. Those sponsored by their universities, governments, or other official bodies receive first consideration in the allotment of vacancies. Established specialists from overseas, here for a relatively short time, who wish to see something of the practice of this country, are always welcome; they are regarded as visiting colleagues, and the experts in their specialties are always ready to receive them and let them accompany them in their work and teaching. In addition, refresher courses for general practitioners are arranged at non-teaching hospitals in London and the home counties. The federation has a central administrative office at 3, Gordon Square, London, W.C.1, to which inquiries should be directed. An information bureau of post-graduate activities in London and other university centres is maintained.

The **Royal College of Physicians of London** holds a series of advanced postgraduate lectures, including some on pathology, biochemistry, &c. The lecturers are drawn from the provinces as well as London. The audience is limited to 200. Details can be obtained from the Secretary of the College, Pall Mall East, London, S.W.1.

The **Royal College of Surgeons of England** has arranged a number of lectures and demonstrations to be held at the college. In surgery two series, each of 24 lectures, will be given during October and April, and at the same time clinical conferences will be arranged at selected hospitals. In anæsthesia two series, each of 45 lectures, will be given in October and March; in addition courses extending over a period of from one to two years are being arranged. Between October and January, and also between March and May, there will be a series of 72 lectures and practical demonstrations in anatomy, applied physiology, and pathology. Lectures in oral, dental, and general surgery will be held in February–March; and lectures and practical demonstrations on the application of the basic sciences to dental surgery will be held in July and January–February. Lectures and courses are arranged during the year jointly with the Institute of Child Health, the Institute of Laryngology and Otology, and the Institute of Urology. Specialists are available for consultation on postgraduate training in general surgery, dental surgery, and anæsthetics. Facilities are now available for advice on postgraduate orthopædic training through the Postgraduate Orthopædic Committee which has its headquarters at the college.

At **St. Mark's Hospital**, City Road, London, E.C.1, surgeons wishing to specialise in proctology may attend a six-month course, and postgraduate students working for higher degrees may come for 1–4 weeks' whole-time study. Intensive courses, each lasting two weeks, are held in conjunction with the Fellowship of Postgraduate Medicine three or four times a year.

The **London School of Hygiene and Medicine** offers a course for the certificate in public health, beginning in October and academic year (the preliminary part, from December, being followed by the certificate). During the second part of the students may elect to make a special study of: trial health; (2) statistics; (3) hospital (4) tropical hygiene. The elective course in health is recognised in part as qualifying for the tion for the diploma in industrial health; and tunities are given for visits to factories and industrial establishments.

The school also provides courses for the bacteriology and in tropical medicine and a short course in medical statistics.

The course in bacteriology, starting in October, academic year and is intended to give advanced to graduates in medicine or veterinary science who follow a career in bacteriology.

Two courses in tropical medicine and hygiene are year, beginning in March and October and months.

The course in medical statistics occupies two days for three months, beginning in April and also in applications are sufficient.

The **Royal Institute of Public Healt Hygiene** offers courses for the certificate in health, starting approximately at the April and October; and for the diploma, February and August. The institute also course for the diploma in industrial health; the for part 1 is the same as that for the certificate in health, while that for part 2 begins in July. Further information may be had secretary, 28, Portland Place, London, W.1.

At the **Tavistock Clinic** the psychotherapy adults and children as outpatients, based on concepts, which has characterised the clinic's in the past, is being developed, and particular is being given to group psychotherapy. In therapeutic work the clinic and the associated Institute of Human Relations are studying preventive psychiatry. These include mothers' groups, selection techniques, and techniques for ing interpersonal relations in industry and psychological and sociological procedures. In the *department* the following activities will begin autumn: (1) a course in outpatient special reference to group methods for a limited of participants of senior registrar status; and (2) lecture-discussion courses in psychopathology and psychology for trainee psychiatrists. In the *guidance department* systematic training is at available for a limited number of psychiatric educational psychologists, child psychotherapists, psychiatric social workers. Both departments clinic have in addition: (*a*) a course for general tioners, once a week for ten weeks, likely to be regular feature; (*b*) case conferences open to a number of senior professional workers on request; (*c*) open case conferences for a limited number of workers. Further information may be had from training secretary, 2, Beaumont Street, W.1.

There are a limited number of opportunities professional training at the **Tavistock Institu Human Relations**. A programme of open discussions will be announced later. The activities of the institute centre on the psychological social aspects of medical, industrial, and problems. Further information may be obtained the secretary.

The **Institute of Psycho-Analysis**, 96, Place, London, W.1, provides training in theory and technique. The course is part-time and about four years. It includes a personal analysis, dance at lectures and seminars (held in the and clinical work done under supervision. required to obtain general psychiatric experience at clinics and hospitals, since the institute does not set all aspects of psychiatry. Completion of the o the satisfaction of the training committee the student for election as an associate member ritish Psycho-Analytical Society. In addition to n course designed for those intending to specialise, tute gives briefer courses from time to time on the ion of the principles of psycho-analysis to medical s. These are advertised in the medical press.

NORTH LONDON POSTGRADUATE MEDICAL INSTI- olds courses in advanced medicine, advanced and obstetrics and gynæcology; and instruction in pathology, anæsthetics, and radiodiagnosis. instruction is given at Bearsted Memorial l, Chase Farm Hospital, North Eastern Hos- orth Middlesex Hospital, and the Prince of General Hospital. During the coming academic here will be eight-week courses in advanced e suitable for those taking the M.R.C.P. examina- ght-week courses in advanced surgery suitable for aking the F.R.C.S. examination, and two-week for those taking the D.OBST. R.C.O.G. examination. r information can be obtained on application to n, Dr. J. Browning Alexander, the Prince of General Hospital. London, N.15.

FELLOWSHIP OF POSTGRADUATE MEDICINE, which office at 1. Wimpole Street, London, W.1, provides information on postgraduate work, and arranges of instruction as follows:

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In Scotland

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE, enting the university and the Royal Colleges of cians and Surgeons of Edinburgh, arranges pro- mes of graduate studies. The board offers courses ernal medicine, general surgery, medical sciences, dvanced obstetrics and gynæcology, and refresher es for general practitioners.

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Open postgraduate lectures of wide interest are organised in conjunction with the courses in surgery and medicine. An increasing number of overseas graduates are attending these courses and it is the intention of the board to provide a hall of residence as soon as possible. Courses are often booked up several months in advance, so those intending to apply should do so at an early date. Applicants should write, giving particulars of their medical qualifications and postgraduate experience, to the Director of Postgraduate Studies, Surgeons' Hall, Edinburgh, 8.

GLASGOW UNIVERSITY offers full-time intensive postgraduate courses in medicine and surgery twice a year. The courses run concurrently, are each of eight weeks' duration, and begin in mid-April and mid-October. These courses consist of clinical meetings, pathological demonstrations, and lectures; they are primarily designed for candidates training for the higher qualifications in medicine and surgery. Courses in pædiatrics, ophthalmology, dermatology, and other specialties are organised when the demand arises, and are advertised from time to time in the medical journals. Recognised training in diagnostic and therapeutic radiology is also available.

For general practitioners refresher courses of a fortnight's duration are held four times a year; they consist mainly of clinical demonstrations, but include also a few lectures on modern therapy. All inquiries should be addressed to the Director of Postgraduate Medical Education, The University, Glasgow, W.2.

SOME FURTHER POSTGRADUATE COURSES *

Anæsthesia

Courses in anæsthesia are held at Bristol and Liverpool, and in dental anæsthesia at Glasgow.

Bacteriology

The London School of Hygiene and Tropical Medicine and Manchester University run courses for the diploma in bacteriology.

Child Health

Courses in child health are held at Bristol, Glasgow, and Liverpool.

Industrial Health

Courses for the diploma in industrial health are held by the Society of Apothecaries of London, the Royal Institute of Public Health and Hygiene, and Edinburgh, Glasgow, and Manchester universities. Manchester University holds a refresher course for industrial medical officers.

At Roffey Park Rehabilitation Centre residential courses lasting one week are held for doctors and others. The syllabus is divided broadly under two headings: (1) maintenance of fitness at work; and (2) rehabilitation and resettlement. Classes are modelled on the lines of the open discussion group. Inquiries should be addressed to the secretary, Training Department, Roffey Park, Horsham, Sussex.

Medical Statistics

Courses in medical statistics are held at the London School of Hygiene and Tropical Medicine, and in statistics (for a university diploma) at Manchester.

Medicine

Among the universities providing courses in medicine are Liverpool (with a course taken by those studying for the M.D. and M.R.C.P.) and Sheffield.

Obstetrics and Gynæcology

A part-time course in obstetrics and gynæcology is offered by Liverpool University, and a course for the diploma in gynæcology and obstetrics by Trinity College, Dublin.

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The ROYAL COLLEGE OF PHYSICIANS OF LONDON holds a series of advanced postgraduate lectures, including some on pathology, biochemistry, &c. The lecturers are drawn from the provinces as well as London. The audience is limited to 200. Details can be obtained from the Secretary of the College, Pall Mall East, London, S.W.1.

The ROYAL COLLEGE OF SURGEONS OF ENGLAND has arranged a number of lectures and demonstrations to be held at the college. In surgery two series, each of 24 lectures, will be given during October and April, and at the same time clinical conferences will be arranged at selected hospitals. In anæsthesia two series, each of 45 lectures, will be given in October and March; in addition courses extending over a period of from one to two years are being arranged. Between October and January, and also between March and May, there will be a series of 72 lectures and practical demonstrations in anatomy, applied physiology, and pathology. Lectures in oral, dental, and general surgery will be held in February–March; and lectures and practical demonstrations on the application of the basic sciences to dental surgery will be held in July and January–February. Lectures and courses are arranged during the year jointly with the Institute of Child Health, the Institute of Laryngology and Otology, and the Institute of Urology. Specialists are available for consultation on postgraduate training in general surgery, dental surgery, and anæsthetics. Facilities are now available for advice on postgraduate orthopædic training through the Postgraduate Orthopædic Committee which has its headquarters at the college.

At ST. MARK'S HOSPITAL, City Road, London, E.C.1, surgeons wishing to specialise in proctology may attend a six-month course, and postgraduate students working for higher degrees may come for 1–4 weeks' whole-time study. Intensive courses, each lasting two weeks, are held in conjunction with the Fellowship of Postgraduate Medicine three or four times a year.

The LONDON SCHOOL OF HYGIENE
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in public health, beginning in October
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Open postgraduate lectures of wide interest are organised in conjunction with the courses in surgery and medicine. An increasing number of overseas graduates are attending these courses and it is the intention of the board to provide a hall of residence as soon as possible. Courses are often booked up several months in advance, so those intending to apply should do so at an early date. Applicants should write, giving particulars of their medical qualifications and postgraduate experience, to the Director of Postgraduate Studies, Surgeons' Hall, Edinburgh, 8.

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For general practitioners refresher courses of a fortnight's duration are held four times a year; they consist mainly of clinical demonstrations, but include also a few lectures on modern therapy. All inquiries should be addressed to the Director of Postgraduate Medical Education, The University, Glasgow, W.2

SOME FURTHER POSTGRADUATE COURSES *

Anæsthesia

Courses in anæsthesia are held at Bristol and Liverpool, and in dental anæsthesia at Glasgow.

Bacteriology

The London School of Hygiene and Tropical Medicine and Manchester University run courses for the diploma in bacteriology.

Child Health

Courses in child health are held at Bristol, Glasgow, and Liverpool.

Industrial Health

Courses for the diploma in industrial health are held by the Society of Apothecaries of London, the Royal Institute of Public Health and Hygiene, and Edinburgh, Glasgow, and Manchester universities. Manchester University holds a refresher course for industrial medical officers.

At Roffey Park Rehabilitation Centre residential courses lasting one week are held for doctors and others. The syllabus is divided broadly under two headings: (1) maintenance of fitness at work; and (2) rehabilitation and resettlement. Classes are modelled on the lines of the open discussion group. Inquiries should be addressed to the secretary, Training Department, Roffey Park, Horsham, Sussex.

Medical Statistics

Courses in medical statistics are held at the London School of Hygiene and Tropical Medicine, and in statistics (for a university diploma) at Manchester.

Medicine

Among the universities providing courses in medicine are Liverpool (with a course taken by those studying for the M.D. and M.R.C.P.) and Sheffield.

Obstetrics and Gynæcology

A part-time course in obstetrics and gynæcology is offered by Liverpool University, and a course for the diploma in gynæcology and obstetrics by Trinity College, Dublin.

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Health Services at Home

PUBLIC HEALTH

roduction of the National Health Service has effect on the duties of the medical officer of environmental hygiene. These responsibilities ved over the last hundred years from the basic ervices introduced with difficulty and by slow the instigation of the first M.O.H.s. Originally H. was closely concerned with the detailed of all this sanitary work, but the passage of led to the general acceptance of much that was secured with difficulty and spasmodically xpress personal intervention. Health depart- e now organised to allow the M.O.H. freedom ch detailed work which can be effectively per- y trained lay officers or even transferred to the other departments, as in water-supply and isposal. Naturally the extent of this devolution nsibility varies widely. Rural water-supplies ation remain a constant concern of the M.O.H. ervision of housing conditions, again mainly sanitary inspectors, is a health-department ility. All this work must remain under the ontrol of the M.O.H., and he must also supervise ty of water-supplies even though their production is concern. Though less concerned personally ailed sanitary work, he now supervises a far ld than his predecessor of a hundred years ago.

l of infectious diseases has always been one of the ncerns of the M.O.H. The old emphasis on isola- now been replaced by the provision of modern treatment but there remains the active home o. Bacteriologists have made great advances dentification of different strains within certain pathogenic species, and these new techniques, to epidemic control, have given the M.O.H. an ent of precision in much of his epidemiological The application of specific prophylactic measures various of the acute infections is now a major of health departments; and already the control of eases as diphtheria and enteric fever is in sight.

National Health Service Act has profoundly the work of the M.O.H.s of counties and county s—local health authorities as they now are. ve ceased to hold any responsibility for adminis- of hospitals, except that some individuals are s of hospital management committees. After cal Government Act of 1929 came into force, administration occupied the time of these in some sense at the expense of preventive e in which they have been specially trained. eless it will rest very largely with them to secure ordination of hospital and preventive services at nagement-committee level; indeed their influence point is crucial. No other medical men will be placed to survey the whole field of medical in an area. Regional hospital boards usually egular meetings of liaison committees of M.O.H.s, y on the M.O.H. of the local health authority to ine the urgency of social grounds for admission ents to hospital, especially maternity cases and onic sick. Local health authorities, under part 3 Act, provide clinic and other services for mothers reschool children, domiciliary midwifery, health g, home nursing, immunisation and vaccination, nces, care and aftercare, and domestic help; and have preliminary schemes for health centres. has been rapid growth of some of these services, ularly ambulances, home nursing, and domestic Their intrinsic importance is great, and their oution to the hard-pressed hospital service no less. .O.H. is the officer on whom the administration of services falls. Their complexity and the need for knowledge in day-to-day administration has led counties to devise schemes of divisional adminis- n which are of particular importance to the student se of their effect on the path of entry to the public- service, especially where divisional county posts ombined with the office of M.O.H. to one or more y districts.

mo the service will probably not, as
lier gh the clinical side but through
assistant administrative posts concerned with control of infectious diseases and organisation of clinic services. Thus there will be far less likelihood of medical officers who have taken postgraduate qualifications in public health devoting the rest of their professional lives to clinical work in a limited field. The very fact that those who undertake clinical preventive work will also be engaged in curative work will bring the administrative medical officer responsible for the organisation of clinic services into far closer contact with his professional colleagues. It is probable that experienced general practitioners will play an increasing part in the clinic services of local health authorities. For many years there will, of course, be whole-time officers engaged in clinic work, but it does seem likely that the public-health officer of the future will be usually concerned with organisation rather than with routine clinic duties. This redistribution of work coupled with the provision by local health authorities of health-centre buildings for general practice should help to produce an ever closer association between M.O.H. and general practitioner—a voluntary association arising from a knowledge of the help each can give the other.

The curriculum for the diploma in public health now provides a first part which is suitable for men engaged in tuberculosis or venereal-diseases work: a certificate is given to those who pass the examination for part 1 only. The course for part 2 provides for those who intend to take the diploma and enter the public service. Possession of a D.P.H. is necessary for anyone now seeking appointment as a medical officer of health.

INDUSTRIAL MEDICAL SERVICES

THE complexion of the industrial medical services is likely to be altered in the near future: and whether it is to assume a more roseate or more pallid hue will largely depend on the report of the committee which has been set up under the chairmanship of Judge Dale. The formation of this committee was announced by the Prime Minister on June 1, when he said that, to secure that the country's limited medical resources were used to the best advantage and with regard to economy, it was essential that these services should be organised so as to ensure that there was no duplication or misdirection of effort. The council of the British Medical Association on May 28 published a memorandum on a comprehensive occupational health service. It is likely that there will be as many schemes as there are interested bodies.

At present the main Government department supervising the health of industrial workers is the factory department of the Ministry of Labour and National Service. This department, which up to 1940 worked under the Home Office, dates from 1833 and administers the Factories Acts (1937 and 1948) with regulations on accident and sickness prevention, hours of work, amenities, and canteens. The staff numbers about 350, of whom 16 are doctors. All members of the department, whether lay or medical, take part in activities directed towards preventing illness and maintaining the health of the factory population. The medical inspectors are stationed in London, Birmingham, Sheffield, Liverpool, Bristol, Manchester, Glasgow, Leeds, and Wolverhampton; and from these centres they are able to deal with factory health and conditions in any part of the country. Under them 1750 general practitioners give part-time service as "appointed factory doctors" (previously called examining surgeons), examining all young entrants into industry and periodically all those engaged in specified dangerous processes.

A recent survey by the factory department of the medical services in different kinds of factories showed that of 243,769 factories in Britain 4499 have arrangements for medical services other than those supplied by the appointed factory doctors. General medical supervision is provided in 2525 factories, and supervision of first-aid and ambulance-room services in 2511, while in 2274 various groups of workers are given periodical medical examinations. There are schemes for looking after the workers on three trading estates—Slough, Bridgend, and Hillington. The Slough scheme covers 114 factories, of which 33 employ fewer than 26 workers: at Bridgend there are 39 factories, of which 15 employ fewer than 26 workers, while at Hillington 69 of 126 factories employ fewer than 26 workers. It has been an oft-repeated criticism of the industrial medical services that the workers at small factories are not catered for, and these three group-services might well form a model for a national service.

Whole-time service in factories is given by 53 doctors who are also appointed factory doctors and by 186 who are not. Of the total number of factories 4499 (1·85%) have medical arrangements other than the statutory examinations of young persons, the percentage increasing with the sizes of the factories. These figures perhaps give a false picture of the position if the close watch kept by the factory department on conditions in all factories is not kept in mind.

Apart from the factory department, other Government departments deal with various aspects of the industrial medical services. For instance, the Post Office, which employs more workers than any other department, has had a medical service since 1855; and since it deals with engineering and manual workers in addition to office staffs, it is partly an industrial medical service. The Ministry of Fuel and Power has a mines medical service, described below, and the National Coal Board also has a staff of medical officers. The Ministry of Supply medical service deals with the health of the workers in the Royal Ordnance factories and in the research stations such as Porton and Harwell. The Ministry of National Insurance has on its staff the former Silicosis and Asbestosis Medical Board, which deals with the diagnosis and certification for compensation of cases of silicosis and some other forms of pneumoconiosis. There are about 20 whole-time medical officers, who carry out these functions in addition to making pre-employment and periodical medical examinations of workers in certain industries liable to produce silicosis and asbestosis. A board consisting of three doctors was set up in Manchester in 1941 to issue compensation certificates to cotton-workers who develop byssinosis.

In addition to investigations and research into industrial diseases conducted by medical inspectors of factories, mines medical officers, and works doctors much fundamental research into environmental conditions has been carried out by investigators of the Industrial Health Research Board of the Medical Research Council. Clinical and field studies made under the ægis of the council's Industrial Pulmonary Diseases Committee include inquiries into the pneumoconiosis of coalminers and the byssinosis of cotton-workers. The London Hospital department for research in industrial medicine was established by the council in 1943, and a few years later, in conjunction with the Ministry of Fuel and Power, a bureau for research into the pneumoconiosis of South Wales coalminers was set up at Cardiff. Other research units have been established at Birmingham and Porton to study various aspects of industrial problems. Research into industrial health matters is also being undertaken by the various university departments mentioned below.

University chairs devoted to industrial or occupational medicine have been set up at Manchester and Durham and readerships at Glasgow and Edinburgh. The chairs of social medicine at Oxford and Birmingham include industrial medicine within their terms of reference, and the University of Sheffield has recently appointed a professor of social and industrial medicine. Students are likely to hear more about industrial and social medicine in their undergraduate courses. Postgraduate courses are held in London, Birmingham, Sheffield, and Manchester. Diplomas in industrial health (D.I.H.) have been instituted by the Society of Apothecaries, the Conjoint Board of the Royal Colleges of Physicians and Surgeons, Edinburgh University, and the Faculty of Physicians and Surgeons of Glasgow. Full-time courses for the diploma are provided by the Society of Apothecaries of London, the Royal Institute of Public Health and Hygiene, and Manchester, Glasgow, and Edinburgh Universities.

The Association of Industrial Medical Officers was formed some years ago by doctors interested in industrial health and branches have been established in various parts of the country; the *British Journal of Industrial Medicine* is sponsored by the A.I.M.O. in conjunction with the British Medical Association.

MINES MEDICAL SERVIC

THE Mines Medical Service of the Ministry of
Power since its inception in 1943 has cons
chief mines medical officer and his deputy at
and a mines medical officer in each of the
coal-producing regions of the country. The
have been selected primarily on account
experience of and qualifications for mining
work; and by virtue of their special knowle
environmental factors in mines they act in an
and consultative capacity to the Minister of
Power and his administrative officers, H.M.
of mines, mine managements, other Government
ments, medical bodies, and others concerned.

The work of the mines medical officers is d
securing that the health of the mine-workers i
tained at the highest level, particularly in re
occupational factors. They are therefore co
supervision of medical arrangements (including
at mines themselves, and with ensuring that
treatment and rehabilitation are available fo
workers following injury or illness, and that th
are used to the best advantage. Where the p
a necessary service falls short of need, it is their
propose improvements. They are also concer
investigation and research into illnesses
commonly among miners.

During the war years, the Ministry of Fuel and
medical staff was necessarily concerned with
temporary work, such as the medical aspects of
ment and conservation of man-power. Certain
schemes, however, were put into effect,
among which is that whereby workmen who are
at the mines, where they are often not readily a
to a doctor, can have morphine administered to
specially selected certificated first-aid men empl
the mines. Long-term policies were also develop
some of these are now well established, such
arrangements for medical examination of all
to coalmining below 18 years of age and the
examination, including X ray, of all entrants,
of age, to the South Wales coalfield. Another
ment of significance is the provision at certain
medical-treatment centres staffed by State
nurses working under the direct supervision of
Where this scheme is already operating it is
workers with early treatment of a very high

Since Jan. 1, 1947, the National Coal B
operated the coalmines of the country in
with certain statutory requirements, one of
to secure the health of the persons they empl
implement this requirement, the Board are in the
of engaging medical staff to advise them on ma
health and to exercise medical supervision o
employees by continuing the development of the
initiated by the Ministry of Fuel and Power.
work of the National Coal Board doctors devel
Ministry's Mines Medical Service will be freed to
more of its attention to additional constructiv
which has had to be left in abeyance while temp
immediate problems were dealt with.

PRISONS AND BORSTAL INSTITUTIO

AT the larger prisons whole-time medical
appointed, and at the most important ones
medical officers are assisted by one or more
officers. Salaries are in accordance with the
Civil-Service scales, and appointments are
unfurnished quarters are provided at most prison
moderate rental. Preference is given to
practical experience of psychological medicine
all-round knowledge of general medicine and
Appointments are made by the Civil Service Comm
6, Burlington Gardens, London, W.1, to wh
inquiries should be addressed.

At the smaller prisons no whole-time medical
are employed; local practitioners are usually ap
as part-time officers. Further particulars of
appointments can be obtained from the Prison
missioners, Horseferry House, Dean Ryle Street,
S.W.1.

Services Abroad

COLONIAL MEDICAL SERVICE

cies in the Colonial Medical Service occur in all the Colonial Empire, the greatest number being al Africa and Malaya. Candidates must ordinarily h subjects holding medical qualifications regis- the United Kingdom and should have had at lve months' postgraduate experience in hospital ppointment. Candidates for the permanent nust be under 40 or 45 years of age, according ge of compulsory retirement in the territory to ey are appointed. In West Africa this is 50 years, ost other territories 55 years. Contract appoint- or short terms are available for candidates who ve the age-limits or who, while being within nits, do not wish to commit themselves to a career at the outset. Officers appointed to the nt service are normally required to take a course cal medicine and hygiene either before going or during their first leave.

al officers are usually appointed in the first for general duties, which require all-round and a balanced outlook upon both preventive ative medicine. Such duties often imply the of a district hospital and responsibility for the administration of a district, although many are employed on clinical duties in the large s. Some posts are concerned purely with public- work, and for these the possession of a D.P.H. al experience in preventive medicine is necessary. general field there are ample opportunities for investigation, and subsequent specialisation is ged. Opportunities are offered wherever possible cers to study for postgraduate qualifications in anch of medicine, surgery, or public health.

ge number of specialist appointments exist which mally filled from within the service by officers he necessary aptitude and qualifications. For ppointments a very high standard of professional nent is required. Senior administrative appoint- are also almost invariably filled by the promotion ing officers. The Colonial Medical Service is unified hout the Colonies and promotion takes place in ministrative or specialist branches either in the y where the officer is serving or on transfer to r. The scope for promotion is therefore con- ble. The total of the establishments of the various ment medical departments amounts to some uropean medical officers and an even greater r of officers appointed locally.

ers possessing qualifications or experience in ogy would be considered for appointment to the tory establishments. Workers in the laboratories out pathological and biochemical examinations inical, forensic, and public-health purposes. In ranch has been carried out a great deal of the ch work which has led to important advances in nowledge of tropical medicine and local health ms. There are a number of vacancies for women s, especially for those with special experience in rics, school health, child welfare, and nutrition, gh their employment is not necessarily confined se subjects.

urally in tropical and subtropical countries diseases ar to hot climates predominate in the general n of morbidity; but the whole gamut of patho- l conditions found in temperate climates occurs in opics, and doctors in the Colonial Medical Service xpected to keep abreast of the trend of modern al opinion in Britain.

late years progress in the control of tropical diseases been so rapid that Europeans can now live in ort and in hygienic surroundings in areas which lecades ago were notoriously unhealthy. There is however, a great deal to be done; and with the nsion of medical services to raise health standards colonies, the Colonial Medical Service offers special rtunities and ample scope for initiative and original [illegible] in clinical subjects, preventive medicine, [illegible] arch. Full particulars of terms and conditions of service may be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith Street, London, S.W.1.

SOUTHERN RHODESIA MEDICAL SERVICE

THE government of Southern Rhodesia maintains a medical and public-health service with an establishment of 19 whole-time administrative, specialist, or public-health officers and government medical officers. The rates of pay for the whole-time officers are:

	Annual salary
Secretary for Health	£2130
Director of preventive services; director of curative services	£1900
Regional medical officer of health; 2 directors of laboratories; medical superintendent, leprosy hospital; medical superintendent, mental hospital..	£1595–£60 to £1775
Senior schools medical officer; 2 radiologists	£1420–£60 to £1540 –£55 to £1595–£60 to £1775
Nutrition officer; radiologist; pathologist; psychiatrist	£1420–£60 to £1540
Assistant medical superintendent, mental hospital	£1240–£60 to £1360
Schools medical officer (man); 2 schools medical officers (women)..	£1040–£36 to £1184

Government medical officers are graded as follows:

2 senior government medical officers ..	£1595–£60 to £1775
4 senior government medical officers ..	£1420–£60 to £1540
44 government medical officers	£710–£30 to £1070

In addition to the salary scales shown, there is a cost-of-living allowance varying from £167 to £213 a year on a sliding scale. Children's allowances are also paid.

Whole-time medical officers and the six senior government medical officers are not permitted private practice but are allowed consultant practice. Government medical officers, except those stationed at Salisbury, Bulawayo, Umtali, Gwelo, Gatooma, and Que Que are allowed private practice, the value of which varies from £100 per annum upwards, according to the station. The duties of government medical officers include supervision of the 16 government hospitals and 82 native clinics, and attendance on police, boarders in government schools, and prisoners. They also undertake medicolegal work and public-health duties. Leave may be granted at the rate of one-eighth of service, and may be taken in periods not exceeding 184 days at a time. Study leave may also be granted. After two years' service medical officers under the age of 45 can be appointed to the fixed establishment, and contribute to a pension scheme. The retiring age is 60. On appointment, government medical officers are usually stationed at Salisbury or Bulawayo, where they are paid an allowance of £200 per annum in compensation for not being allowed to undertake private practice. They are usually required to do relieving duties at various out-stations until appointment to a permanent post. Appointments in Great Britain to the service are made through the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W.C.2, who will supply further details on request.

SUDAN MEDICAL SERVICE

SINCE 1947, in pursuance of its policy of building up the professional services from trained and qualified Sudanese, the Sudan government has suspended recruitment of British officials on pensionable terms. At present there are opportunities for appointment of British doctors on short-term contracts for up to six years: the contracts may be renewable. These will be general-service posts and will be open to men probably up to the age of 45. The salary will be a good deal higher than for the long-term contracts, and for a man with special qualifications, or above the age of 40, will be in the region of £E1300 a year. At the end of their six years' contract these officials will qualify for a gratuity equivalent to six months' pay. Candidates must pass a strict medical examination. Free passages by air or by sea are provided by the government on the official's appointment. As regards leave passages, there is a government air charter system whereby officials and their families are provided with free passages to the United Kingdom; but those not wishing to take advantage of this charter may be given a leave passage allowance. No income-tax is payable in the Sudan. There is, in addition to the basic salary, a cost-of-living allowance varying from £E190 to £E390 according to the number of dependants. An official's first term of service is usually about eighteen months, after which he qualifies for leave. If he travels by the air charter system he is entitled to 80 days in the United Kingdom; otherwise he is entitled to 85 days between departure from and return to the Sudan. Accommodation is not provided free, but rent is paid on all government quarters.

MEDICAL MISSIONARY SERVICE

CHRISTIAN medical men and women who wish to offer their services where the need is greatest will find opportunities in medical missionary work. There are university medical schools, central and rural hospitals, and many opportunities for public-health work and research. *Christian missions can claim to have given* China a modern medical profession. In India and Pakistan they have helped to maintain high ethical and professional standards, and have specialised in nursing education. In Africa and other primitive regions they have pioneered rural health services and the training of subordinate staff. All over the world the work is becoming integrated with the government services though still maintaining its identity. For undergraduate candidates for the service there are hostels in London and Edinburgh, and also various scholarships. At least eighteen months or two years of resident appointments is advised for all, and special diplomas or higher degrees for some. Special missionary training is also required by some societies. Service is for terms of from two to six years according to the country and climate; there are opportunities for postgraduate study during furloughs. Offers for life service are expected, but short terms are considered. Salary is on a missionary subsistence basis with allowances, free passages and quarters, and pension provision. There are schools for missionaries' children at home and in many of the fields. Applications from students or qualified men and women should be made either to the secretary of one of the denominational or interdenominational missionary societies, or through the local branch of the Student Christian Movement or the Intervarsity Fellowship, or to the Chairman, Medical Advisory Board of the Conference of British Missionary Societies, Edinburgh House, 2, Eaton Gate, London, S.W.1.

BRITISH MEDICAL STUDENTS' ASSOCIATION

THIS association was founded in 1942, and its membership includes the student body of most medical schools in Great Britain and Northern Ireland; the Irish Medical Students' Association is affiliated. It is a purely professional body whose sole object is to promote the interests of students, by providing a means of communication between those at different universities and with other professional organisations and Government departments.

The *British Medical Students' Journal* undertook a new rôle recently when the editorial board organised on behalf of the B.M.S.A. a conference of editors of medical student magazines. Similar conferences are to be held each year. The other publication of the B.M.S.A.—the diary—was introduced last autumn. It proved very popular and is being republished with a number of improvements.

The main contact between the association and Government departments during the past year has been with the Ministry of Education. In consultation with the Ministry's representatives the B.M.S.A. has been able to explain to students the position of those with further education and training grants.

The organisation of clinical conferences continues to be one of the most important aspects of the association's work. Four or five of these are now held every year in various parts of the country, when a hundred or so students from many different medical schools meet for several days of concentrated work and social activity. Visits are made not only to the important hospitals and medical centres in the district, but also to char industrial centres of medical interest.

Efforts on behalf of medical students from medical schools who desire to visit the hospita country, and vice versa, have been especially en The conference of deans has agreed to the exc foreign and British students for the summer provided the deans concerned give their testimonials; and the regional hospital boar been very generous in responding to a request th should open their wards to visiting foreign stu is hoped that thus some return may be made great hospitality shown to medical students fr country when they travel abroad. The B.M.S contact with most other national medical organisations, but is not connected with an national student organisation. Correspondence be addressed to the secretary of the association House, Tavistock Square, London, W.C.1.

EMPIRE MEDICAL ADVISORY BURE

THE British Medical Association has set up the Medical Advisory Bureau with a view to ma stay of overseas medical visitors to this co profitable and pleasant as possible, by welcom and providing a personal advisory service. Th which is at B.M.A. House, Tavistock Square, W.C.1, caters mainly for Dominion and Colonia men and women who are staying in this cou postgraduate education or other purposes. Inf is obtainable about postgraduate education an of study for higher qualifications; and inquire put in touch with the organisations and a providing postgraduate education. The vis wishes to see something of the latest medical w own specialty can be put in touch with the ap experts.

A register of suitable hotels and lodgings is m by the bureau, and every effort is made to hel to solve the problem of finding somewhere to social functions and in other ways doctors Dominions and Colonies are enabled to m other and prominent members of the professi country. General information about trave facilities, exhibitions, theatres, &c., may also The bureau can be of greatest service to the vi writes as long as possible in advance of arriv information on the following lines: projecte arrival, mode of travel, whether accompanied period of stay, objects of the visit, and in w assistance is desired. On arrival a letter of int from the local hon. secretary of the visitors association, although not essential, would be The medical director of the bureau is Dr. H. A. S to whom all communications should be address

THE MEDICAL WOMEN'S FEDERAT

ALL qualified medical women are eligible as of the Medical Women's Federation, which l local associations all over the country and in Ireland, as well as a large London associatio overseas association linking up members all world. The federation is non-political. It medical meetings for its members and pu quarterly journal reviewing subjects of specia to women doctors. These naturally cover a of social medicine, including maternity and chil women in industry, the care of children and and delinquent children, the management o schools and day-nurseries, *women in prisons,* c approved schools and remand homes, the il child, and many related subjects. Advances in and gynæcology, and psychological studies of w children are also naturally of special interest doctors; and recent work in these branches of is reviewed in the journal. From time to federation undertakes social studies and pub results. It is also able to protect the intere members by presenting arguments in any ca there has been discrimination against women The federation's headquarters are at Tavisto North, Tavistock Square, London, W.C.1.

In England Now

ng Commentary by Peripatetic Correspondents

summer of 1914 at a farm in the hills in mid- ree hours' journey from my hospital. I was a woman who had been in labour for over he diagnosis was twins. There was no window droom, the temperature was over 100°F, the a wick dipped in oil, and I had two charcoal for my instruments. My anæsthetist was a ter who had never heard of anæsthetics and help was a doddering old crone of 80-odd, deaf nd hope. I used forceps and delivered a head. round to replace my forceps in the steriliser urning back found that the head had retracted ppeared. I was a bit shaken but thought, easy, the other twin is across the shoulder and l as a spring and withdrawn the head." I there- ied the first head up, brought the second head d delivered. At this stage my anæsthetist, in to my shout of "Stop pouring you fool!" *nan was far under) stopped work and I took* ian's heel *on my* forehead and hit the wall ne. When we got straightened out I found the nead had gone back. Now, I am of Scotch on but I would willingly have given £5 to have teacher, Dr. Peter Horrocks, to take on. But s wishful thinking, and after decapitating both . at last delivered a Siamese twin joined all ne side.

take it that if you deliver two heads and both you have quite possibly to deal with Siamese I have not seen this symptom mentioned as an the diagnosis, and it may be useful to anyone vith this unusual condition. As a matter of , the woman recovered and had normal deliveries rds.

* * *

a pity that the noble art of the bedside manner nore popular with the present student generation. en-necked shirt, grubby hands, and stubbly chin male student or the drooping petticoat line of posite numbers may seem to their owners signs gress, witnessing to the fact that superficial ances are no indication of the brain underneath. nay be true, but to the patient, his mind fuddled ness and incapable of deep reasoning, they are ce of irritation; one cannot blame him if he es physical untidiness with an untidy mind. ly the man with an over-confident breezy manner nothing-to-worry-about school—does not gain the t's real confidence as does the more diffident aking one, who spends fifteen minutes gazing at wing abdomen, "anxious to do the thing properly," y confirming the patient's own view that his ien is the most peculiar and important in the

* * *

ing our years as students most of us developed e ideas on what we would *not* like done to ourselves. uncture, even in our unskilled hands, was no hardship. Abdominal paracentesis, the removal tches, and pneumothorax refills, with or without hesia, though momentarily painful, were soon over. terisation and urethral dilatation were procedures oposed not to incur in the near future. But the idea of having a needle slipped between our spinous sses into the deeper recesses of our back at once ed the usual cutaneous responses to unpleasant tions. In postgraduate life, we came to include hoscopy in the same category; not because it ys produced trauma but because we had seen gh examples in which it did. We had watched tient straddling a straight-backed chair while a eman forcibly conducted a frontal assault with a straight weapon; we had leant heavily on the lders of a frail old body, whose efforts to reject ube returned him to the ward labelled "uncoöpera- " and we did not forget the delightful county cillor, who, fairly early in the proceedings, rose from the table and, in bare feet and long shirt, padded out of the theatre, anathematising the profession.

But my turn came, and I was glad that the anæsthetist effectively ensured that my coöperation would not entirely depend on my control of my reflexes. Passivity was in fact only once strained after the initial spraying, swabbing, and intratracheal injection. That was when the operator looked towards the left upper lobe. There was no doubt about the mechanical advantage enjoyed by the hand pressing gently on a bronchoscope in position. The thoracic inlet or the angle of the jaw provides a fulcrum, and the range of movement produced in my somewhat ankylosed neck really surprised me. So, though my flesh no longer creeps at the mention of the bronchoscope, I propose visiting a manipulative colleague for a little intentional neck-wringing before again placing myself so completely at another's mercy.

* * *

Many—perhaps even most—practitioners nowadays rely mainly on commercial circulars for their information on new drugs and therapeutic procedures. These circulars are attractively produced and usually contain a clear summary of recent work on the preparation concerned; but, inevitably, many of them are biased. The proper time to learn to appraise published work is as a student, when there is easy access to teachers who will point out the fallacies. If this habit is not cultivated during student days, how much harder it will be to acquire it afterwards when in practice, with few advisers and less time to spare. Any student who has not acquainted himself with the following books and journals in his medical school library has inevitably missed the university bus: *The Tissues of the Body*, by W. E. Le Gros Clark; *Recent Advances in Pathology*, by G. Hadfield and L. R. Garrod; *Nature*; *Physiological Reviews*; and, of course, *The Lancet* and *B.M.J.* Some critics will say that this sort of reading is not necessary or even desirable for the future general practitioner. I cannot agree, for it is the only way to learn how to judge the evidence for oneself—and incidentally to realise how ephemeral is the greater part of modern therapeutics.

* * *

The Oriental candidate was leaving nothing to chance. He had appreciated that his examiners were simple-minded old gentlemen. "Anorexia," he wrote, "is the condition when patient complains of no hunger. The patient says that he or she is not feeling hungry and is not inclined to eat. His appetite is always nil. The commonest cause of anorexia is having had a big meal."

A boisterous (Occidental) colleague tackled the question with gusto. "I am glad," said he, "that an essay is requested and not the usual direction to discuss the subject. For this affords me the opportunity to recommend that the stomach should be treated with becoming respect, and I heartily commend as an object lesson the instructive conversations between Nat Gubbins and his gastric diverticulum." Another "essay" was at least commendable for its brevity and frankness together with its implied appeal *ad misericordiam*. "Anorexia means loss of appetite, and since I do not know the mechanism of appetite I cannot do justice to anorexia."

I often wonder if the examinee who ends his paper with "*no time for more*" really supposes that he will earn some sort of bonus. The truly dramatic touch is added by a half-completed sentence or even word, as if the pen had been wrenched from the grasp by an adamant invigilator. To me it is distastefully reminiscent of the "thanking you in anticipation" bluff. Examiners may be simple-minded old gentlemen but hardly as simp. . . .

* * *

During an "at home" at a famous medical school I was impressed by the interest visitors showed in the small collection of historical relics—they even preferred these to the monsters which have such a fascination for lay people. It occurred to me that all medical schools should have and take a pride in such a collection, recording its past, not just for parents and charming sisters to admire but also for the inspiration of its students in their more receptive moments.

In making a historical collection one is apt to forget that the present is the past of the future. So present-day common objects which will be interesting in years to come should be preserved at the same time, such as complete sets of class-cards or notebooks. Where there is a photographic department, this can contribute to keeping a complete record of the hospital and school; or the aid of enthusiastic amateur photographers could be sought. Everybody should lend a hand. What a record it would be, for instance, if we had a complete set of candid photographs of famous lecturers of the past in action. An occasional charge on school or club funds could bring in a shorthand-writer to make verbatim reports of lectures—not special addresses but ones taken at random, so that the future historian would see just what lectures to students were like. And might not some students who have the diary-writing urge (and capacity) keep a detailed day-to-day record to illustrate the everyday incidents and life of the place?

If a medical school feels it is too much trouble to preserve and display reminders of its past at least it should not consider it below its dignity to keep a scrapbook, seeing that the Royal College of Surgeons has done the same—and fascinating volumes they are, too, among all the other treasures of Lincoln's Inn Fields.

* * *

The undergraduates of this university have had a variety of schooling; of say twenty students, three or four have been to public schools, seven or eight to grammar schools, and the rest to secondary schools. At a discussion group the other day the subject raised was the best type of education to advise parents to seek for their sons. Now these men were fourth-year medical students and had had plenty of opportunity to compare themselves one with another. What surprised me was the vehemence with which they advocated a boarding-school education for boys, especially when an only child is concerned. The basis for their attitude seemed to be the necessity of boys being taught responsibility. William Temple put the matter crisply at the Arnold centenary celebrations: "If you are to develop in people a sense of public spirit, it can only be done by making them members of a community in which they have a real measure of responsibility, so that they know that the tradition of the community is entrusted to them." If we are to obtain the full benefits of an extended education, those who guide our schools should put this principle into practice. As boarding-schools are impracticable on a numerically large scale, it is up to our secondary-school headmasters to introduce the "run by the boys themselves" system to the greatest possible extent.

* * *

There was no necessity for the M.R.C.P. candidate to be preceded by a man playing the bagpipes to advertise the land of his birth. Apart from his accent, his contribution to our consultation consisted of non-committal phrases with qualifications to satisfy all possible contingencies.

"Is that a diastolic murmur one hears in this situation?" "Well, I wouldn'a say that it wasn'a."

"Do you think digitalis would do any good?" "Well, perhaps it might not do him any harm."

"Would it be advisable to have those bad teeth extracted?" "Well, it might not be a bad idea."

At the end he requested some information about the quality of his performance. We examiners are prepared to parry this inquiry with the conventional regret that the regulations prohibit any such premature revelation. But he was so curiously persistent that I hinted that his anxiety was excessive and that in due course he would hear officially if his further participation in the examination was required. "But that's just the point," he explained. "I am going back to Edinburgh tonight and I'd like to know if I ought to take a return ticket."

* * *

During the war years there were good reasons for appointing student house-officers: not only did they do some useful work, but, for a man who felt that he had been allowed to lead a normal life too long as a privileged person, the job offered a rational outlet for his desire to be doing something. Now that this overriding urgency is past, teachers in medical schools should look further ahead. In at least one provincial teaching hospital students are still encouraged to fill gaps in house-surgeon
appointments. Five years is all too short a time
the theoretical basis of medical practice, and a
has not learnt his theory well as a student will n
it later; whereas a man who has never perf
lumbar puncture or set-up an intravenous
student will certainly learn to do so during his
job, when he can always obtain advice or
from the R.M.O. or R.S.O. Our teachers must
producing the man who will be the best d
years after leaving school and not the one who
technical competence, but least basic unde
in five years.

* * *

I have been "reviewing the literature" again.
a job! It isn't only that the papers on one's
seem to be intentionally distributed over every
on earth but that so many go out of their way to
their message and obstruct the reader. This
kind of thing:

Pardoy's Disease

A. B. PARDOY

M.D. Heckmondwike

It is interesting to note that the literature
relatively rare and ætiologically obscure disease of
adults has tended to grow considerably since the
of hostilities (cf. Hitler, A. in *Mein Kampf*) in
(*Eisenhower and Churchill 1945*). *Interest* was s
by the publication of an unselected series of 3
Pearce (1946); and further cases have since
subject of investigation by Brewer (1946), Stewar
Gurney (1947), Davy (1947), Widdon (1947),
(1948), and Cobley et al. (1949).

Ætiology and Pathology.—Prior to the ap
these reports the ætiology of the lesion was sp
and following them authoritative opinion has
the view that it is unknown. It cannot be de
it has been suggested that the disease is due to
but confirmation of this has not yet occurred
allergic hypothesis, though still occasionally prot
unfortunately does not account for the pathog
all the morbid processes which are recognised as
following the onset of the disease. Post-mortem
is slender; and the best that can be said is t
difficult to credit that the rapid onset is att
to a physical basis without the superimposition
chemical phenomena early in the morbid ph
The whole matter of the mechanism and co
between the lesions on the one hand and the s
and signs on the other would seem to be indet
and sub judice. It may be hoped that thr
application of radioactive isotopes the problem
be elucidated.

Clinical Picture.—The disease occurs most fr
in young adults. In his series of 3 cases Pear
showed that the incidence was about 66% in
giving a female-to-male ratio of 2:1. It occ
statisticians, however, that this difference in sex
might arise through the majority of young m
individuals being required to undergo a period
in the Forces; and the objection has been
by Donner and Blitz (1949), who in the
of 2 cases brought to light an equal distrib
incidence between the two sexes in Germany,
Lichtkörpen (1933) stresses, conscription no longe

Diagnosis, Prognosis, and Treatment.—The
is dependent on a thorough history and exa
which, as is now generally appreciated, mus
transillumination of the nail-bed—Pardoy's test
1938). In our (Pardoy 1947) view, my disease
differentiated from more common disorders
procedure. The prognosis is not unfavoural
phonamides have been tried; but the most
results have been reported from phalloidomycin
soff (1948) was able to demonstrate that
substance were injected intrahepatically a 10
rate occurred at three months. Ingenious as
nique is, it has to be remembered that without
recovery has never failed to occur in 7½ days.
facilities for the injection of antiphallinic seru
be available prior to carrying out this treat
our (Pardoy, personal communication) view,
be reserved for cases where the diagnosis is equ

Notes and News

SOURCE OF CORTISONE (COMPOUND E)

nce Hench[1] and his colleagues at the Mayo Clinic 1 that rheumatoid arthritis dramatically improves ment with 17-hydroxy-11-dehydrocorticosterone d E, 'Cortisone') chemists have been trying to w methods of preparing the drug and searching er sources of raw material. The present source holic acid, obtained from ox-bile. The preparation, entails 36 chemical stages, all with a small yield, mething like 12,500 tons of beef cattle is required e enough bile to make sufficient cortisone to treat tic patient for a year. The scarcity of cortisone, being produced only at the rate of 200 g. a month erck Laboratories, at Rahway, New Jersey, may be y the fact that it now costs £1500 a week to treat nt.[2] Since the dose is 100 mg. daily. the present output is only sufficient for the prolonged treatment odd patients. Even so this would cost the almost ible figure of £400,000 a month. The need for ces of supply is thus readily understood.

me is a compound containing a cyclopentenophenan- ucleus, which is also present in vitamin D, the s of the adrenal cortex, the sex hormones, the bile e saponins, and the cardiac glycosides, such as Kendall, who isolated cortisone, obtained it from far back as 1929, Jacobs and Heidelberger,[3] of the ler Institute for Medical Research, isolated a cardiac , sarmentocymarin. from the seeds of a species of thus, *Strophanthus sarmentosus*. From this by is they obtained a sarmentogenin, although for many ere was considerable confusion over the identity species that yielded this substance. More recently in of Basle, who spent nine months in Africa collecting s of strophanthus, has definitely identified *S. sar-* s as the source of sarmentogenin. The importance ompound is that it is more nearly related to cortisone ical structure than is desoxycholic acid. American s have now converted sarmentogenin into cortisone ocess involving 20 stages.[4] This is still a formidable is, but a great improvement on the 36 stages necessary conversion of desoxycholic acid into cortisone. Unless horter synthesis is devised the seeds of *S. sarmentosus* the raw material from which cortisone will be obtained future. Supplies of the plant, which is a vine that on the trunks of trees in Liberia and other parts of should be practically unlimited. It can be propagated eds and cuttings and if necessary could be cultivated rge scale in Africa. It might even be grown in other ial regions, though when plants are grown out of their habitat the yield of drug obtained from them may fall. re already under way to try to cultivate *S. sarmen-* American possessions with a suitable climate. It is nial but takes about five years to bear seed, so until tion is well established cortisone is still likely to be The possibility that other species of strophanthus yield sarmentogenin should not be overlooked. One is certain; unless some new and novel source of ne, or an allied substance, is discovered, arthritic ts in this country will have to wait a little time for upplies of the drug.

enocorticotrophic hormone (A.C.T.H.), which seems to ndirectly, much the same effect as cortisone, is reported[5] [illegible] at the rate of 60 pounds a year by the Armour [illegible] Chicago from hogs' pituitary glands. This [illegible] d treat 2000–4000 patients, but the present t is being allotted entirely to American hospitals for l trial.

TWO NEW JOURNALS

introducing the first quarterly number of the *Journal Faculty of Radiologists* the editor (Dr. Peter Kerley, ed by Dr. F. Campbell Golding and Dr. Frank Ellis) ns that it will mainly be devoted to clinical radiology ill aim to establish a closer link between members of aculty and radiological colleagues at home and abroad.

The *Annals of the Institute of Laryngology and Otology*, of which the first issue has appeared, is designed to record the work done in the institute itself and at the associated Royal National Throat, Nose, and Ear Hospital. Contributions are invited from past and present members of the institute.

ROUND AND ABOUT STEPNEY

Winifred Stamp's biography[1] of Dr. Harry Roberts tells much of his lively mind, humanity, wit, and incorruptible determination to go his own way (though he always managed to do it without harm to others): and it also tells, unintentionally, much of Winifred Stamp. Those who knew the people in this short arresting book recall gratefully her gift of telling a story—used splendidly here—the generosity of her mind. the ease of her friendship, and her superlative cooking. Dr. Roberts was as different from ordinary people as his house was different from ordinary houses; and though it has not been possible to crowd into 163 pages more than an outline of his odd and impressive character, the picture is done so deftly that his friends will say again and again, "There he is: that was Harry"; while those who never met him will find themselves waiting pleasurably for the next characteristic bit of behaviour, the next bold stroke on behalf of some oppressed group or other. His life as a doctor in Stepney. his long career as a journalist, his considerable political influence, his green thumb, and the group of friends who shared his adventures all find their place in this book: but its chief charm lies in the sense of comedy which carried these friends through the extraordinary situations to which Harry's versatility continually introduced them.

University of Cambridge

On Aug. 20 a special congregation was held to award honorary degrees to members of the first International Congress of Biochemistry now meeting in Cambridge. The degree of D.SC. was conferred on Lord Addison who was presented as the father and patron of medical studies, on Prof. C. F. Cori of the Washington University school of medicine. on Sir Charles Harington, F.R.S., director of the National Institute for Medical Research, on Dr. Kaj Linderstrom-Lang. of the Carlsberg Laboratory, Copenhagen, on Prof. Arne Tiselius. of the Royal University of Uppsala, and on Dr. Jacques Tréfouel, director of the Pasteur Institute.

Edinburgh Post-Graduate Board for Medicine

On Monday, Aug. 29, at 4.30 P.M., in the anatomy theatre of Edinburgh University, Dr. C. H. Andrewes, F.R.S., will speak on Influenza in Perspective.

Royal Institute of Public Health and Hygiene

Dr. René Sand, professor of social medicine in the University of Brussels, will deliver the Bengué lecture on World Trends in the Teaching of Social Medicine and Public Health. He is to speak at the Institute, 28. Portland Place, London, W.1, on Thursday. Sept. 15, at 3 P.M.

Royal Free Hospital

A clinic on rehabilitation will be held by Dr. Howard Rusk of New York at the hospital, Gray's Inn Road, London, W.C.1, on Wednesday, Sept. 14, at 2.30 P.M. Those who wish to attend should notify the medical rehabilitation unit at the hospital.

Medical Research Council

The council have made the following travelling awards for the academic year 1949–50:

Rockefeller Travelling Fellowships in Medicine

Mr. W. J. Atkinson, Mackenzie Mackinnon research fellow (Royal College of Surgeons), National Hospital, Queen Square, London.

Dr. Ruth E. M. Bowden, lecturer in anatomy, Royal Free Hospital school of medicine, London.

Dr. R. Daley, first assistant, cardiology department, St. Thomas's Hospital, London.

Dr. J. Dawson, lecturer in biochemistry, University of Leeds.

Dr. C. E. Lumsden, senior lecturer in pathology, University of Aberdeen.

Dr. J. S. Robson, assistant, departments of medicine and clinical biochemistry, University of Edinburgh.

Dorothy Temple Cross Research Travelling Fellowships in Tuberculosis

Dr. A. J. Robertson, medical registrar, Royal Infirmary. Liverpool.

Mr. J. D. Wade, surgical officer, Welsh National Memorial Association (Sully Chest Centre).

Travell [illegible] *Arrangement with the Centre* [illegible] *in France*

Dr. I [illegible] rsity of Bristol.

Miss [illegible] research unit, psychological [illegible]

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ach, P. S., Slocumb, C. H., Barnes, A. R., Smith, H. L., olley, H. F., Kendall, E. C. *Proc. Mayo Clin.* 1949, 24, 277.

ee *Lancet*, July 23, p. 159.

w *York Times*, June 1, 1949.

obs, W. A., Heidelberger, M. *J. biol. Chem.* 1929, 81, 765.

w *York Times*, Aug. 16, 1949.

d. July 28, 1949.

[1] Doctor Himself. London: Hamish Hamilton. 1949. Pp. 163. 10s. 6d.

South-East Metropolitan Regional Tuberculosis Society

A meeting of this society will be held at B.M.A. House, Tavistock Square, London,, W.C.1, on Saturday, Sept. 10 at 10.30 A.M. when Mr. R. C. Brock will speak on the Secondary Effects of Tuberculous Mediastinal Lymphadenitis with special reference to Disease of the Middle Lobe.

Vitamin B$_{12}$

A solution of crystalline vitamin B$_{12}$ is now being marketed under the name 'Anacobin.' Supplies are restricted; and the manufacturers, the British Drug Houses Ltd., urge that it should be used only for patients who are intolerant of liver extracts or who have a personal or family history of allergy.

War Pensions Review Tribunals

The Ministry of Pensions announces that applications for review of cases by the special review tribunals will not be accepted after Nov. 30. These tribunals were set up in 1946 to enable claimants whose appeals had previously been disallowed to have their cases reconsidered in the light of certain High Court judgments which had affected pension law.

Course on Rheumatism

A weekend course on the chronic rheumatic diseases, with lectures, ward rounds, and practical demonstrations, will be held at the rheumatism unit, St. Stephen's Hospital, Fulham Road, London, S.W.10, on Oct. 1 and 2. The course is being opened by Sir Ernest Rock Carling, and the following will take part: Dr. Francis Bach, Dr. Grace Batten, Dr. Philip Ellman, Mr. A. Timbrell Fisher, Dr. Jackson Richmond, Dr. David Shaw, Dr. A. G. Signy, Dr. C. C. Worster-Drought.

Chartered Society of Physiotherapy

The annual congress of this society will be held at St. Pancras Town Hall, Euston Road, London, N.W.1, from Sept. 14 to 18. Dr. J. A. Charles, deputy chief medical officer of the Ministry of Health, will give the opening lecture on Progress Reports from Home and Abroad, and Sir Harry Platt the founders' lecture on the Causation and Prevention of Deformity. Lord Horder will be in the chair at the dinner which will take place at the Savoy Hotel on Saturday, the 17th, when Mr. Aneurin Bevan will be the principal guest. Further particulars may be had from the secretary of the society, Tavistock House North, Tavistock Square, W.C.1.

Refresher Courses for General Practitioners

Financial help may now be had by general practitioners attending special short courses offered by universities and medical schools and consisting of 3 half-day sessions at the weekend or during the week. Under this new arrangement, which supplements those announced last year,[1] a doctor may take in one year a maximum of seven courses of 3 sessions, or any combination of such courses with 11-session courses which does not exceed 22 sessions. The course fees are paid direct by the Ministry; and travelling expenses and subsistence allowance may be reclaimed by those qualifying for grant.

Registration with General Practitioners

Application forms (E.C.1) for registration with a general medical practitioner under the National Health Service are to be withdrawn from post offices and public libraries. They will still be obtainable from executive councils, from doctors' surgeries, and (on the registration of a birth) from the registrar of births. This step is being taken, says the *Ministry of Health*, because of evidence "that the readiness with which the form is at present available encourages some persons to use that form when it ought not to be used—e.g., for a change of doctor (when the medical card should be used). When this happens, there is a potential risk of inflation in the executive council's registers if the form E.C.1 is not completed fully and accurately."

The 1949 edition of the *Register of Special Therapists* is obtainable gratis by doctors on application to the Registrar of the Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

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[1] See *Lancet*, 1948, ii, 662.

Appointments

ARUNDEL, L. V., L.R.C.P.E., D.L.O.: E.N.T. surgeon, F Hospital.

BICKFORD, B. J., M.B. Lond., F.R.C.S.: asst. thorac regional thoracic unit, Broadgreen Hospital, Liverp

BULLOUGH, JOHN, M.B. Lond., D.A.: visiting anæsthetis area and regional chest surgical unit, Liverpool

COCKBURN, WILLIAM, M.B. Aberd., D.M.R.-D.: asst Stirling, Clackmannan, and Falkirk area.

DAVIES, E. B., M.A., M.D. Camb., D.P.M.: psychiatri brooke's Hospital, Cambridge.

FREEMAN, D. M. I., M.D. Lpool, M.R.C.P.: visiting general Rainhill and Winwick Hospitals.

FRESHWATER, D. G., M.A., M.B. Camb., M.R.C.P.: d David Lewis Northern Hospital and Liverpool Stanl

HICKIE, G. C., M.B. Lond.: asst. pathologist, Swindo hospitals.

JOHNSON, R. T., O.B.E., M.A., M.B. Camb., F.R.C.S.: asst surgeon, Manchester Royal Infirmary.

LACK, C. C., M.A. Camb., M.R.C.S., D.P.M.: visiting physician, Magdalen Hospital, London.

LEEMING, D. N., M.R.C.P.: chest physician, Southport and areas.

LEWIS, C. L., M.B. Leeds, D.M.R.-T.: radiotherapist, R district group of hospitals.

MILNE, ADAM, M.B.E., M.B., B.SC. Aberd.: physician-su Kingseat Mental Hospital, Aberdeen.

MORTON, R. B., M.B. Lond., D.P.M.: psychiatrist, He pital, Sussex.

PARKER, W. R., L.R.C.P.E., D.M.R.-D.: radiologist, Dryburn County Hospital, Durham; and Newcastle on-Tyne hospital board.

REES, G. J., M.B. Lpool, D.A.: visiting anæsthetist, O and regional chest surgical unit, Liverpool.

SANDERSON, N. D., M.B. Edin., D.T.M. & H.: medical su Angus hospitals.

SMALL, J. M., M.B. Birm., F.R.C.S.: surgeon, regional neurosurgery, Birmingham.

TEMPLE, L. J., M.B. Lond., F.R.C.S.: asst. thoracic surgeon, thoracic unit, Broadgreen Hospital, Liverpool.

TRUETA, JOSEPH, M.D. Barcelona: orthopædic surgeon Morris Orthopædic Hospital, Oxford.

VAUGHAN-JONES, RONALD, M.B. Birm., F.R.C.S.E., D.O.M.S. thalmic surgeon, Newport and East Monmouthshire, Monmouthshire, and Rhymney and Sirhowy Va of hospitals.

WILKINSON, P. E. D. S., M.D. Lond., M.R.C.P.: de Aylesbury and High Wycombe group of hospitals.

Colonial Service:

BARNOR, M. A., M.B. Edin.: M.O. (African), Gold Coast.
BLACK, J. J., M.B. Glasg.: senior M.O., Uganda.
HOAR, C. E. W., M.B. Lond., D.C.P.: pathologist, Nigeria.
LUCK, L. C., L.R.C.P.E.: M.O., British Guiana.
MCLETCHIE, J. L., M.B. Glasg., D.T.M. & H.: senior M.O.
TRIM, E. A., M.D. Camb., D.T.M. & H.: asst. director of services, Kenya.

Births, Marriages, and Deaths

BIRTHS

BEVAN-JONES.—On Aug. 14, at Swansea, the wife of Dr P Bevan-Jones—a son.

CUBITT.—On Aug. 14, at Sleaford, the wife of Dr. Roland —a son.

DALY.—On Aug. 13, at Newcastle, Staffs, the wife of Dr Daly—a daughter.

DEANE.—On Aug. 16, at Gorleston, the wife of Dr. K. R. B —a daughter.

DENTON.—On Aug. 17, at Cardiff, the wife of Dr. P. H —a son.

DRURY.—On Aug. 13, in London, the wife of Dr. Roger —a son.

ELLIS.—On Aug. 17, at Harrow, the wife of Dr. R. E daughter.

HETREED.—On July 22, at Minna, Nigeria, the wife of Dr Hetreed—a son.

KELSEY.—On Aug. 17, at Hove, the wife of Dr. H M —a son.

KENNEDY.—On Aug. 12, the wife of Dr. David Kennedy

MANN.—On Aug. 17, in London, the wife of Dr. P. G M daughter.

SCARBOROUGH.—On Aug. 16, the wife of Dr. O. Scarbor daughter.

MARRIAGES

—On Aug. 12, in London, William F onel R.A.M.C., to Desirée Maureen

MEDILL—BROOKE.—On Aug. 19, at Purley, Ernest Victor M.B., to Joan Dorothy Brooke.

DEATHS

CHISSELL.—On Aug. 15, in London, Gordon Frank Chissell, M aged 53.

GREEN.—On Aug. 19, Philip Withers Green, M.R.C.S.

JACKSON-TAYLOR.—On Aug. 18, Basil John Francis Jackson T M.R.C.S.

OWEN.—On Aug. 19, at Beaconsfield, Daniel Stanley Owen

SYMONS.—On Aug. 18, at Bournemouth, Annie Dorothea M.R.C.S.

WARWICK.—On Aug. 21, in London, William Turner W M.A., M.B. Camb., F.R.C.S.

WILLOUGHBY.—On Aug. 13, in London, William George Wil M.D. Lond., D.P.H., aged 83.

INSULIN THERAPY

SUCCESSES AND PROBLEMS *

R. D. Lawrence

M.A., M.D. Aberd., F.R.C.P.

TO KING'S COLLEGE HOSPITAL, LONDON, IN CHARGE OF THE DIABETIC DEPARTMENT

ns certain from all Banting's lines of research was essentially interested in the discovery of therapies to relieve the suffering and diseases nd: immediately interested in practical humani- forts more than in pure researches on physio- ecrets such as glycogenolysis or the twitchings r's gastrocnemius. As a clinician he could, of ave been the most successful in the world and ave had the richest and most interesting of s. Not only had he and Best discovered insulin boratory, but they were the first to apply insulin n treatment. Clinical facilities seem to have been for him in Toronto, but clinical teams went ısly to work on the thera- se of insulin, with Campbell tcher at the General Hos- d Mackay, Hipwell, and Dr. christ—himself a diabetic e Christie Street Hospital her centres. Banting was involved, but not in clinical at these centres. In his work he was again in a position, because his early and interests had been inantly surgical; and he dly qualified for full medical in spite of demands of cs from everywhere.

so ultimately laboratory h claimed the rest of g's working life. But his drive and stimulus arose ne suffering sick.

Dr. Fred Banting after a clinical round in 1922.

SUCCESSES

marvellous effect of insulin in ng vigorous health to diabetics no scientific proof but only stimony of severe diabetics ed by its use. This was movingly shown by a d meeting of the Diabetic Association held in n in 1946 to honour the memory of Banting. out Banting," said their diabetic chairman, "this g could have been only a gathering of ghosts ning their fate."

ay the use of insulin is steadily increasing in all ies: in Great Britain, for example, between 1942 48 it rose as shown in the graph. This increase has doubts about the future adequacy of supplies. No if the needs for insulin of countless untreated ics in India and China were suddenly imposed on t sources of production these needs could not be but by the time a realistic and rational demand from such backward countries I should think the eases of countless Chinese pigs and even sacred cattle will be forthcoming. It is true that, even he problem of less wasteful collection of pancreas etter generalised methods of extraction should be ntly in mind; but I do not see that diabetics fear that in another 10–20 years their insulin ements will not be met. Man's scientific ingenuity lve any such problem when it arises.

Meanwhile laboratory work—more exact and less diversified than that of the clinician—has clearly established that many enzyme systems take part in the total use of carbohydrate: it is almost certain that insulin acts primarily by stimulating the enzyme hexokinase to change unutilisable glucose into a phosphate compound, which becomes available as fuel. And other experiments have shown that insulin deals with an inflow of carbohydrate food not only by increasing immediate combustion in the diabetic but also by storing an excess—partly as glycogen but mainly as fat. And we know more exactly the processes by which, in the diabetic without insulin, these stores flow out into the blood and urine as sugar and ketones. But the clinician has long felt or known that insulin makes carbohydrate available and the details of how it acts have not yet made therapy more easy or efficient.

To the clinician the major question at present is how to use the various types of insulin as physiologically as possible to suit the life of diabetic man. It was in some similar purpose and not in abstractions that Banting found his stimulus. To keep a laboratory diabetic animal alive by insulin is relatively easy. But the good clinician must strive to direct a life of normal efficiency and happiness to suit his patients' habits, desires, and temperament; must aim at normal longevity; must be aware of the complications that other illnesses and environmental changes produce to change the usual rhythm of insulin action and the diabetic life. It is no business of his to interfere too much, to change or distort the life of a diabetic in his charge, except to prohibit really harmful habits and factors. With this in mind, let us turn to some clinical problems concerning the action of insulin, in which the humanitarian attitude must never be forgotten. And may I add that we claim no ultimate knowledge of living processes, and that our clinical therapies, however successful, are based on many obscurities of cause and effect which cry for elucidation. May I be excused too for confining myself here mainly to my own often unpublished experiences.

INSULIN TREATMENT PHYSIOLOGICALLY IMPERFECT

One main problem in insulin treatment is that no type of injected insulin can act physiologically to produce a rhythm of carbohydrate metabolism similar to the normal. In non-diabetic people the blood-sugar level is raised for 1–2 hours after carbohydrate food and then rapidly returns to normal, remaining there without any hypoglycæmia. We do not know whether this is due to a nicely adjusted extra secretion of insulin to meet the amount of absorbed carbohydrate—a reasonable concept—or to an inherent liver rhythm of glycogenesis; and we shall not know this, nor the answer to other important problems, until an accurate method of estimating blood-insulin is discovered.

All types of injected insulin given, as they should be, to suit normal habits as nearly as possible, are very imperfect. The long-established treatment with a morning and an evening dose of soluble insulin has given, and gives, wonderful clinical results; but the moment insulin action is exhausted in a severe diabetic hyperglycæmia and ketosis comes surging back

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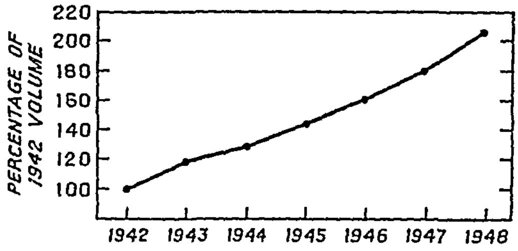
Banting memorial lecture of the Diabetic Association ered on July 22 at King's College Hospital, London.

in 1–3 hours—quicker indeed than the next dose of insulin acts in their reduction. In severe cases we can make a nearer approach to normality by giving two doses, morning and evening, of partially delayed insulins —the original protamine insulin without zinc ('Retard' of Hagedorn) or globin zinc insulin, which I think identical in time action. Since 1937 it has been our practice at King's College Hospital for severe diabetes to use a pre-breakfast mixed dose of protamine zinc insulin (P.Z.I.) and soluble insulin, and the results, while reasonable in the control of hyperglycæmia, have certainly been good as regards nutrition. For milder cases, one adequate dose a day of any type of insulin, but preferably a delayed form, may be very satisfactory—probably because the patients still produce some endogenous insulin. But let me emphasise that no-one who does not know the different actions of various insulins, in strength and timing, can ever use insulin with full efficiency, whether for physiological control or for the strength and comfort of his patients.



Rise in the use of insulin in Great Britain.

VARIED INSULIN NEEDS AND ABSOLUTE DIABETES

I shall now discuss the different insulin requirements, both variable and constant, of different types of diabetics. From this discussion I exclude the middle-aged obese "diabetic" free of ketosis, whom I have described in many papers (Lawrence 1941, 1946) as suffering from, I think, a fundamentally different type of sugar disturbance, to be treated by reducing diet and not with insulin. What follows refers to the severe wasting case, with ketosis as well as glycosuria, who must have insulin for health and even for bare survival.

In my experience the same acute need for insulin is seen in the young (under 35) and in real old age (over 70), when again a newly developed diabetes is usually severely ketotic. (What a contrast to the usual mild obese type of 40–65 years!) In treatment of these cases increasing doses of insulin are given in the first few days until the blood-sugar becomes normal at the period of maximal insulin action, some hyperglycæmia and glycosuria being present at other times. The dose must then be reduced from perhaps 40–80 units a day (10–20 in a 4-year-old) to much less, some 20–30 units in an adult. After this the insulin requirements may remain level for a long time; but in another group of patients they continue to decrease, and very occasionally insulin may be stopped. In these new treated cases we may hypothecate that the function of the beta cells of the pancreas —or at least their production of insulin—was only half destroyed, and that the reduction of hyperglycæmia by exogenous insulin allowed recovery, very extensive if never complete. There is no doubt from animal experiments that hyperglycæmia progressively destroys islet function, and all my clinical experience bears this out. There are other types of mild diabetes, made temporarily severe by sepsis or other complicating endocrine factors, in which the patient may come off insulin and indeed seem almost cured of the disease. Unfortunately we cannot follow even in animals the islet changes that might correspond to these changing clinical phases.

However we may theorise, the vast improvement often seen, particularly in young children, leads to great difficulties and psychological stress for parent
seen several children of from 2 to 6 years old m
dose of 2 units, even 1 unit, of soluble insuli
units of P.Z.I. produced hypoglycæmia, which n
the omission of insulin and roused in the pa
of a cure. Some of these children have rem
of sugar for some days or weeks, but *all hav*
in spite of careful diet. It becomes easier to t
when they need more insulin and ultimatel
stable dosage in relation to diet and activity.

In young adults the same thing may happ
have been puzzled by seeing this more freq
young soldiers (1940–45) than ever before.
reached my attention I could not be sure that
diabetes, and that some mistake in diagnosi
been made. Discovered with acute thirst (but
of *North Africa and India* produced thirst),
been found to have urine heavily loaded with
records often unavailable), and treated most
with large doses of insulin; after which they
intense hypoglycæmic symptoms leading ult
the reduction and necessary omission of th
In 2 of 7 such cases, after three months witho
I could not be sure about their diabetes ev
glucose-tolerance test; and the reality of th
was proved only by their relapse after six
months to a condition requiring fairly large a
insulin. Perhaps this serious relapse could
prevented by a continuous moderate dose of
The majority of Service cases, like civilian c
recover enough to give up insulin; but these e
temporary recoveries present a problem which
approach with vague explanatory hypotheses,
but not publishable. And now let me turn to t
average insulin case.

THE AVERAGE CASE: ? TOTAL DIABET

Sometimes in three months, and usually
three years, insulin cases generally come to a
stability of insulin dose on similar diets. Ma
not much over 30 units (I think the smaller
but most require 40–60 units a day. This de
quite strictly by the amount needed to make t
sugar normal at the height of insulin activity,
any such patients can avoid hyperglycæmia
suria at times when insulin action is weak or
On this criterion all delayed insulins are le
than two or three doses of soluble insulin.
require a high concentration of absorption and
of active insulin which only soluble insulin ca
although I place retard and globin insulin pr
the same category. In their insulin requirem
are almost permanently stable over many year
exercise reduces the need for insulin, while a
infection or a pregnancy usually increases it;
they tend to come to a stable level in stab
stances. It has been said that long-standing
require less insulin as many years go on; bu
remember that the insulin unit was made s
the 1930s, I think this proposition doubtful.

I have thought for many years that such
produce no insulin from their own pancreases.
not be proved without a method of blood-insuli
but the idea is supported by the diabetes stu
few surviving human cases after total pancre
From such it appears that the diabetes produce
some 40 units a day on a regulated diet. S
pancreatectomy up to 30–50% of the ingested
reappear unabsorbed in the fæces, it seems rea
infer that some 40–60 units a day is probably t
normal production of insulin from the pancrea
noticed too in several cases where diabetes is
on chronic pancreatitis, resulting in poor a
how the insulin requirements rise, and weight

bsorption produced by oral pancreatic extracts gh-carbohydrate low-fat diet, which checks the a. It has been very obvious again how a low f total diet, and particularly carbohydrate equires very little insulin, but a higher level of n soon requires much more insulin with a vast ment in energy and weight.

was particularly clear in experiments on myself have never published. In 1923 it seemed possible e might cure diabetes or recreate pancreatic n by keeping the blood-sugar normal, or below for a long time. For six months, therefore, I a very low diet (16 g. carbohydrate, 70 g. protein, fat), with all the insulin I could stand, only s a day (8 and 7). After six months of this weary e I ate more, and my requirements rose to s; I became if not fighting, at least playing, fit. ears later I put myself back on the previous low st 10 lb. in ten days and returned justifiably to lier dose of 15 units a day. From this one should ber that the dose of injected insulin needed varies lute diabetes with the intake of food and the body- Allen abundantly proved this in pre-insulin by his undernutrition treatment of canine and diabetics. Insulin requirements in absolute es are largely a function of weight and food and a vast reduction of insulin is sometimes seen wasting conditions of terminal carcinomatosis or of anorexia nervosa.

EXTREME INSULIN RESISTANCE

us now turn to one of the greatest obscurities in treatment, the patient who requires enormous of insulin, 500 units or more a day. I am not ng to those cases in which complications—usually ons—require temporarily a large increase in insulin ck ketosis and prevent coma. What I have in are long periods of vast unexplained insulin with a return later to average requirements.

quantitative needs of such patients are as clear he average case. If they require 1000 units per or control, 1200 units will produce hypoglycæmia 00 permit a relapse with ketosis. And so they e quantitatively like an average case, but the dosage multiplied 10–30 times. The most ehensive and important paper on this condition Smelo (1948) who reviews 54 published cases.

re is no type, age, or nutritional state in which this ance especially develops. The first patient I studied lad of 25 who needed 400 units a day from 1924 27, and then gradually returned to some 60 units, ich he has remained ever since. From 1944 to 1947 5 other such cases (unpublished), but I have seen in the last twelve months, so the condition is very I have not seen an uncomplicated case which was ant at the beginning of insulin administration. In xperience they respond to average amounts of n at first, do well clinically, and then develop the n-resistant state mostly in about three months. of this are loss of weight, thirst, and much glyco- and ketosis on the previous effective dose. The n must be boldly raised merely to prevent coma. me cases, raising the insulin from 50 to, say, 100–150 a day will control the diabetes. A complicating r may be found: but the real resistant cases I am concerned with do not respond so easily and require hundreds of units a day even to save life, and inly to restore health. At this stage inpatient ment is essential, and the use of the highly concen- d insulin solution (320 units per ml.), kindly ared by Messrs. Boots Pure Drug Co., has been most able in reducing the uncomfortably large bulk of the l preparations. I have compared the action of 640 s soluble insulin given as 2 ml. of the special preparation with that of 640 units given as 8 ml. (i.e., 80 units per ml.) and have been unable to observe any difference in speed, strength, or duration of action. When insulin is given intravenously these cases show an equal resistance. I should mention that P.Z.I. is too weak in circulation to be of any use, though I admit I have not experimented with a depot injection of thousands of units.

The plan of treatment followed is essentially the same as in non-resistant cases: insulin dosage is pressed rapidly until ketosis first disappears, glycosuria is reduced to a minimum, and the blood-sugar is controlled so that there is no hypoglycæmia at the time of maximal insulin action—a tricky process. I do not pretend to know when a dose of 600 units produces its maximum action. We usually find that the patient needs the biggest dose before breakfast (e.g., about 600 units), much less before supper (200–400 units), and sometimes we must add a small (!) dose of 100 units at lunch. When a controlling dose is reached, be it 600 or 1600 units a day, a balance between food and insulin is reached. An increase of 200 units produces typical hypoglycæmia, an equal reduction a relapse of sugar and ketones. But always in our cases a point has been reached when less and less insulin controls the situation and ultimately the dose necessary for control returns to an average one. This reducing phase is full of danger of hypoglycæmia unless there is close and regular supervision.

Can we give any explanation of this rare and strange phenomenon? Neither our experience, nor any published work I know, gives any satisfactory reply. In the 5 cases I have seen, all complicating septic or endocrine conditions were excluded, as far as possible; but most cases have shown a rise in erythrocyte-sedimentation rate during this resistant state, which disappeared when it ended. Severe diabetes does not affect the sedimentation-rate, and this finding may have significance. None of these patients has shown any local or general allergic manifestations to insulin. A few have been examined, by the rabbit technique, for resistant components in the plasma, with negative results. It has been suggested that in these resistant phases the patient develops antibodies, reagins, call them what you will, which react with injected circulating insulin and make it almost ineffective. Lowell (1944) has published the most suggestive—but far from convincing—article on this thesis. Like so many problems of medical science, it stands unsolved at present, a fascinating challenge to speculation and sifting experiment. And we need never fear that by solving one problem we shall solve all those that make scientific medicine so fascinating. For, when we have found an answer to one immediate problem, it always proves to be only penultimate, leading to another. We reach another stepping-stone in a river too wide to see the further bank. This is what makes medical science a stimulating and vivifying, though sometimes an overtiring, pursuit.

CARDIOVASCULAR AND OTHER COMPLICATIONS

The diabetic state gives rise to very interesting organic changes in many systems of the body, and all the results noted are, at least to me, ætiologically unsolved problems. The vascular effects are the most important and devastating, and on these I shall concentrate in a moment. But before this I would note the interesting changes in the eye focus, the acute cataract, and the sometimes temporary lens opacities that occur with diabetic phases of dehydration and rehydration, apart from the retinopathy which all too often develops after years. Evanescent or prolonged peripheral neuritis, and its obscure relation to the vitamin-B complex, is another problem.

There is no doubt that, as the years go on, diabetes produces widespread associated degenerations, primarily in the vascular system. We knew that these occurred in the elderly mild cases, but the long survival of the young effected by insulin shows in many the same disastrous pattern of complications. Twenty years ago I taught the students that many elderly diabetics developed a triad of retinopathy, albuminuria (with or without hypertension), and gangrene, commonly all present together. And now to watch this same picture, though without gangrene, develop in more and more young patients is a tragedy and a challenge.

It seems probable that the same type of vascular *degeneration must be induced in most of the organs*, whether it be first noted clinically as retinal hæmorrhages, slight albuminuria, or mild hypertension. One often sees in the eyes some punctate retinal aneurysms (see Ballantyne, 1948, for full description and histology) for five to ten years before other complications appear, the rest of the cardiovascular systems remaining strictly normal. These hæmorrhages may come and go, and I have seen them—and sometimes even exudates and massive cholesterol deposits—completely disappear, never to recur. Ophthalmologists are apt to disbelieve, because they do not see such cases unless they watch patients for years at a diabetic clinic. I have a large group of them, mainly at 55–70 years of age. Another unfortunate group, mostly between 30 and 40, before any arteriosclerosis or hypertension is present, develop a quickly progressive retinopathy, with large hæmorrhages into the vitreous from bursting irregular veins and new preretinal vessels, and may be nearly blind within two years (retinitis proliferans). Another group, mostly those with long-standing diabetes from childhood or later, after a few retinal hæmorrhages over a year or two, or even before any hæmorrhages, begin to develop slight hypertension, often before albuminuria; and I look with grave suspicion at a blood-pressure rising from 110/70 to 125/90 as one commonly sees in these young adults. And in another few years we find their renal and hypertensive elements progressing rapidly until the full syndrome of renal failure or hypertensive disasters is complete. The universality of intercapillary nephrosclerosis (Kimmelstiel Wilson syndrome) is now recognised. The early retinal diabetic picture is obscured by added renal features, with arteriosclerotic changes, œdema of retina, choked disc, and woolly exudates.

Similar observations have been reported from studious clinics in every country, and the subject was discussed at the American Diabetic Association in 1948. Dr. Priscilla White (1948) reported 92% affected in 220 patients originally under 16 who had suffered for 20 or more years from diabetes developing in their childhood, and Dr. Dolger (1948) reaffirmed his finding of 100% affected of all ages after 25 years' duration. Our experience at King's College Hospital is bad but not so devastating, and I know 7 patients, myself included (29 years), who are free of such vascular stigmata. And I know of one case of 39 years' duration completely free of all vascular complications. So while one case shows lesions at an early stage—$4\frac{1}{2}$ years is the earliest clearly dated case in my experience—others may escape for another 30 years, without any fundamental difference in their diabetic state. The innately different quality of vascular resistance must play a part in diabetic as well as other types of vascular degeneration. *One sees a similar state* of blood-vessels at 40 and 85.

Ricketts (1948) made a very balanced assessment of possible causes in this vascular situation and found no causative agent beyond the prolonged diabetic condition.

As it is not obvious how hyperglycæmia per se would cause vascular changes, other thinkers look for a common causal factor for both the diabetes and the vascular degeneration. I myself suggested four years ago a common hidden basis, perhaps pituitary, producing vascular degeneration and diabetes; for I had never seen vascular changes in the pure and prim islet and pancreatic destruction, found in h tosis and in chronic and relapsing pancreatitis. this idea has been shaken by two describing retinopathy in relapsing pancreati 1947) and in hæmochromatosis (personally me from Australia by Dr. Stawell). These seem to me to dispose of the above hypothesis me back to the diabetic state, probably hype as the primary and direct cause. This leads t question. Does clinical experience show that controlled cases develop vascular complicatio and more often than the better controlled?

I think they do. The first complicated cases I saw were in the most wildly unc revolting from excessive parental anxiety or the exuberance of adolescent freedom—and reasonably well whether their average bloo 300–500 or 100–300 mg. per 100 ml. The Bos has assessed poor control in their childre incidence of coma and finds more complicatio cases. But one sees retinitis equally common long-standing cases in middle-aged people have such exuberant hyperglycæmia, but wh sugar runs from 200 to 250 ml. for years, o before diabetes leads to troublesome sympton disturbance from retinitis is quite often their sign of diabetes; indeed, in 1945 at King Hospital 15% of the newly diagnosed cases al retinopathy. And so I think that it is years glycæmia that we find associated with vascula and I do not know whether a high or mode *makes much difference.*

Unfortunately we do not know whether cæmia in diabetes would prevent these com though that seems to me likely from the sma of very mild cases I have seen for years witl near-normal glycæmia and no vascular com But the majority of the diabetics I treat normoglycæmic for most of their hours, and unlikely that other people's patients are diffe mild patient controlled and nearly aglycosur has usually a near-normal blood-sugar ran about 130 to 200 mg. per 100 ml. The average i on 30–50 units a day is strictly orthoglycæm a few hours, at the height of insulin activit certain other times has blood-sugar of abou This might be prevented by giving small doses four or five times in 24 hours, but it cannot be by any possible treatment with only one or two a day without perpetual risk of hateful hypo And so in my cases, and I think all others, hyperglycæmia are constantly present. An confidently claims to maintain a physiologica blood-sugar in the average insulin case has, no wide or accurate experience.

And is it, as 15–20 years go on, this hype which induces vascular change? Other cholesterol and lipoid *abnormalities, general* or vitamin deficiencies, protein and mineral seem almost ruled out. But we are left guessing how hyperglycæmia does harm. Could it do *mere physicochemical* effect of excess circulatin Or does a mildly defective nutritional sta endothelial degeneration? Is there some process peculiar to vascular normality whicl interferes with? The difficulty of the subject justify the formation and investigation of any which might bear on it.

Experimental work on animals, that illumina has so far been of little help in the problem o degeneration. Dragstedt (1945) reports undu sclerosis in depancreatised dogs, and Lukens a pillary glomerulosclerosis in a dog diabetic I do not think retinal lesions have been ls, perhaps they have not been seriously he long-term nature of such animal es them very difficult and tedious.

OTHER PROBLEMS

lems fascinate and puzzle me as a ention a few more worthy of study. continued insulin injections is different patients. Some show ge except a slight local fibrosis, Others develop huge fibro-fatty lumps, nen and children develop disfiguring areas phy in injected areas and sometimes in nearby ected parts. In a few individuals the insulin produces local allergic effects, and very rarely and generalised allergy.

eculiarities of diabetic *pregnancies* are being y studied at present, and it is held by the hool that imbalance of the hormonal picture of y is the cause of frequent maternal toxæmia leath of the progeny. Research is in progress centres, but the problem remains sub judice.

ocial problems arise for diabetics from the long thy life that Banting has given them, and in clinician is intimately concerned. Brief mention ade of a few. The question of their employment, erannuation, and life assurance—still often by pre-insulin prejudice—is gradually being their favour. Special Banting memorial ent homes and educational homes for difficult children have been established, initially by the drive of our unique Diabetic Association of nd the doctors concerned with it. A happy effort, which has also begotten today's memorial.

CONCLUSION

are the particular qualities of mind and spirit l to scientific discoveries such as Banting and What makes men devote themselves to such d pursuits which we must consider the quint- f human progress? Never direct financial gain: umanitarianism; partly ambition to make a d satisfy the power complex by success; but think, the need of the inquiring mind to explain wonder. This inquisitiveness, this search for ion, for a logical pattern of cause and effect is n human mental processes, from the puzzled of a child to the adult questionings of the and the philosopher. Banting always had the of scientific inquiry and imagination to a high quality difficult to define. It seems to consist ly in a *critical refusal* to accept current theories lanations; to look at known facts themselves in nd personal way; to notice contradictions and ncies in existing thought; to build in the tion a new explanation and then to work on this our and with an open mind, to prove or disprove hypothesis by controlled experiment. And the he hardest and requires faith, hard work, dour qualities, all of which the two discoverers of needed in the highest degree to bring Banting's fruition.

tain the open mind is a difficulty which leads tray in scientific work. It is all too easy to become n favour of our own hypothesis, the darling child magination; to invent experiments to prove our to neglect disappointing discrepancies that ict: and so, by neglecting facts, to give birth ror which may take ten years to expunge. It is to act like a lawyer pleading and proving his l not like a factual scientist who must be ready to imself disappointingly wrong.

I conclude by honouring the memory of Banting, whose example of sane imagination and vigorous determination should live in our lives today.

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THE GUILLAIN-BARRÉ SYNDROME OR ACUTE INFECTIVE POLYNEURITIS

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Guillain, Barré, and Strohl (1916) described a severe form of flaccid paralysis in two soldiers who had complained first of abnormal sensations in the feet, then of weakness of the legs which made walking difficult. Later the legs and then the arms became paralysed, with some involvement of the trunk and, in one case, of the neck. The cranial nerves, however, were not affected. There was no fever and no preceding illness. In spite of the apparent severity of the condition at its height, both soldiers completely recovered, leaving hospital after forty-one and thirty-three days. Examinations of the cerebrospinal fluid (C.S.F.) revealed normal pressures, normal cell-counts, and negative Wassermann reactions, but an increased concentration of protein, reaching 250 mg. per 100 ml. in one case and 85 mg. per 100 ml. in the other. No evidence of diphtheria was obtained from throat swabs, and there was none of alcoholism. These workers drew attention to six features that they regarded as important: motor impairment, abolition of tendon-reflexes with preservation of cutaneous ones, paræsthesiæ with only slight objective sensory change, pain on pressure over muscle masses, slight modification of the electrical reactions, and hyperalbuminosis of the C.S.F. without cellular reaction.

For this clinical picture the name of polyradiculoneuritis was proposed, since it was held that, though the symptoms were due to a polyneuritis, the alterations in the C.S.F. denoted an inflammation of the spinal nerve-roots in their intrathecal course. Polyneuritis of toxic origin was well known but was not thought to affect the C.S.F. Osler had described an "acute febrile polyneuritis" of unknown ætiology which presented a similar course, but a sharp fever (103°F) was a characteristic feature, whereas the French cases were afebrile. Since 1859 the name of Landry had been attached to a type of acute ascending flaccid paralysis which differed in being usually fatal. Polyradiculoneuritis therefore was offered as a new entity.

Some years earlier Laurens (1908) had collected from reports published between 1859 and 1905 eighteen cases which are of interest in this connexion, though many of the descriptions were written before the introduction of lumbar puncture. Laurens grouped them together because of the facial paralysis, which Guillain did not at first realise could occur in his polyradiculoneuritis, and in some cases the rest of the illness is briefly alluded to, but eleven of the eighteen are described in such detail as to leave no doubt that we are reading of what Guillain et al. (1916) called polyradiculoneuritis and other workers the Guillain-Barré syndrome. Other descriptions antedate that of Guillain et al., but Laurens's collection is the most striking.

Similar illnesses in Allied troops were subsequently noted. Holmes (1917) reported "about twelve" cases of symmetrical flaccid paralysis which he said "might be provisionally included under Sir William Osler's title of acute febrile polyneuritis." It seems that the pyrexia was not well marked, and he noted: "It has rarely been possible to observe the degree or type of fever at the onset." In the light of subsequent experience it seems unjustifiable to separate this group on the basis of fever alone. Case-records are not given, but the paralysis was often preceded some weeks earlier by a brief infective episode, such as an influenza-like attack or a sore throat. Hesitant micturition was noted, but catheterisation was never needed. Facial paralysis was usually present, dysphagia sometimes, and diplopia on three occasions. Two patients died of pneumonia, the rest recovering completely. Lumbar puncture, done in three cases, showed *no abnormality of cells or* other constituents, but the C.S.F.-protein is not stated and may not have been estimated. In the opinion of many workers these cases fall into the Guillain-Barré group. The name "acute febrile polyneuritis" did not persist.

Bradford et al. (1919) made a more elaborate study on British troops in France, summarising their findings in some thirty cases, which they stated were of the same type as Holmes's. There was the same symmetrical flaccid paralysis, with abolition of the tendon-reflexes and little objective sensory change. The facial nerves were involved seventeen times, the sixth once; dysphagia and palatal paralysis were rare. The proximal limb muscles were most affected, a point which in my own experience is significant. Fever does not seem to have been well marked. Four C.S.F. examinations were made and said to be normal, but again no C.S.F.-protein levels were given. Eight patients died, and from glycerinated emulsions of the spinal cords of three of these a similar disease was said to be produced in monkeys (*Macacus rhesus*) by subdural inoculation. These workers were thus led to propose a new name: "acute infective polyneuritis." The transmission experiments have been much criticised and have never been successfully repeated, but the name has persisted in British writings, where it must be regarded as synonymous with the Guillain-Barré syndrome.

The French did not admit the identity of the two conditions, holding their syndrome to be always benign, but this distinction could not be maintained. With increasing knowledge it was recognised that death could take place, especially from respiratory failure and if pneumonia developed. The supposedly characteristic C.S.F. findings turned up in other illnesses and were not always present in cases that were otherwise typical. Guillain for a long time resisted all modification of his original specification, and stated (Guillain 1936) that he preferred to exclude all fatal cases, all febrile ones, and all those with a C.S.F.-protein level less than 100 mg. per 100 ml. He accepted the frequency of seventh-nerve involvement, however, and his ten new case-records included examples of it. Later Guillain (1938) admitted the possibility of death in somewhat grudging terms. As regards the C.S.F. he agreed that the changes were never in themselves pathognomonic. Other contributors expressed similar views.

In America the term acute infective polyneuritis is less commonly used than the eponym Guillain-Barré syndrome. Many other names have been suggested.

CASE-RECORD

The following is a typical case of benign flaccid paralysis closely resembling that described by Guillain et al. (1916).

Case 1.—A married woman, aged 33, was admitted to hospital on June 13, 1947, unable to move her legs and with weakness of arms and face. Her illness had begun fourteen days previously, with tingling in her toes, first in the second and third toes of the left foot, then in the corresponding ones on the right. Seven days before admission she had
noted severe weakness in her legs, and since four
she had been unable to walk. At this stage then
tingling in her hands, and it had become difficult
the left side of her face. Shortly afterwards the
her face had become similarly affected, and wit
come a slight difficulty in swallowing and talki
had been no disturbance of sphincters, no anteced
and no sore throat.

On examination she was a well-developed wom
bilateral facial paralysis of the lower-motor neu
The other cranial nerves appeared normal and th
obvious impairment of speech. The fundus oculi
on both sides. In the arms there was weakness of
affecting the proximal groups and those of the sho
most severely, with the result that the grip was p
some extent but the patient could not lift her arm
bed. The biceps, triceps, and supinator reflexes
bilaterally. There was no objective sensory loss t
cotton-wool, or vibrating tuning-fork in any part o
Weakness of the trunk prevented the patient from
unaided, but the abdominal reflexes were all prese
legs the proximal groups of muscles were also mo
with the result that the patient could not lift her l
bed or extend her knee against gravity, but
flex and plantar-flex her foot at the ankle powe
large muscle masses were soft, and normal tone
Knee and ankle reflexes were unobtainable;
reflexes were flexor. No abnormality was discov
other system. There was no fever, and the bl
was 140/90 mm. Hg.

Lumbar Puncture.—The C.S.F. on the day afte
was under normal pressure and gave a negative W
reaction. The C.S.F.-protein level was 120 mg.
on June 13, 450 mg. per 100 ml. on June 27,
per 100 ml. on July 25. On the same dates the cel
less than 5 per c.mm.

Progress.—After admission the patient began
slowly, with no treatment except aneurine by mo
daily. The left side of the face was the first to sh
recovery, which were noted in about a fortnight.
arms regained a little power. About a month afte
on July 14, 1947, the administration of neostig
b.d. was started. It was continued for five d
which time the patient became able to sit up a
did not appear that this was more than would
at her previous rate of progress. At the end
abdominal colic and disturbance of bowel fu
troublesome in spite of atropine sufficient to pr
mouth, and neostigmine was therefore stopped. I
continued, and physiotherapy was begun. Six
admission the patient could lift her legs straight fr
the left side of her face moved well, and mo
returning to the right side. She could walk a f
Aug. 11, 1947, two months after admission;
reflexes were still absent, and the right side of t
still paralysed, the left side and the arms bei
On Aug, 20, 1947, the patient was walking outsid
and a faint response to the supinator reflex was
Sept. 1, 1947, nearly three months after adm
patient was walking a quarter of a mile, the righ
face was practically normal, and there was a s
response in biceps and ankle jerks. On Sept. 1
was discharged from hospital, without further
the reflexes but otherwise well.

This case and seven others are summari
accompanying table. Each of these patients
symmetrical flaccid paralysis involving parti
proximal muscles of the limbs, and reaching
forms to the cranial nerves, with a predilecti
seventh (cases 1, 3, 7, and 8). Affection o
cranial nerves except the first and eighth
reported, and the symptoms suggest that the
involved in case 1, but such involvement i
transient compared with that of the sevent
œdema seems only to have been recorded i
cases (Ford and Walsh 1943). I have onc
sixth nerve affected, in a case not included
the present series subjective sensory changes
onset, but there was little objective loss t
tests. Tendon-jerks were always lost in th
limbs, the abdominal *reflexes* eing usually

SUMMARY OF CASES

Age (yr.)	Extent of paralysis	Duration (days)	Result	C.S.F.-protein (mg. per 100 ml.)	Antecedent illness
33	All limbs, right and left face, and pharynx	108	Discharged walking	120 on 14th day; 450 on 28th day; 55 on 56th day	None
65	All limbs	125	,,	300 on 40th day; 500 on 60th day; 240 on 75th day; 160 on 99th day	,,
24	All limbs and left face	32	,,	> 100 on 12th day	,,
61	All limbs	76	,,	85 on 16th day	,,
33	All limbs, partially	54	,,	65 on 44th day	"Flu" a week before
48	Legs, and arms partially	47	,,	45 on 23rd day	One-day fever 3 weeks before
23	All limbs, and left face	125	,,	45 on 1st day	A cold 2 weeks before
13	All limbs, and right and left face	7	Died	140 on 5th day	A cold 3 weeks before

C.S.F. showed less than 5 cells per c.mm. in all specimens.

plantar reflexes flexor. The extensor plantar claimed by some to be present in the early d to afford evidence of implication of the upper urone, was not seen. Sphincters were unaffected, oss of voluntary muscle power and the enforced ιcy produced at times a little difficulty with on in the most acute phase. There was never en muscle weakness began, but in four cases s a history of a febrile illness a few weeks earlier. was normal in all respects except the C.S.F.- level, which was usually raised, sometimes the paralysis improved (cases 1 and 2). Recovery plete except in case 8, who developed convulsions spiratory function was still good, and died In 189 cases previously published 34 patients %), but this mortality is heavily weighted by re to recognise mild cases. Both sexes are affected, and the condition may develop at any remes of 2 and 78 years having been recorded. cases are the rule. I have not met the chronic polyneuritis described by some workers—e.g., (1940)—as the same condition, but it seems to erent disease.

PATHOLOGY

ontribution of morbid anatomy to the under- of this disease is slight. In those dying at ht of the paralysis—e.g., case 8—as well as those f unrelated intercurrent disease, the scanty ied lesions found post mortem give no clue to gin. Necropsies have been recorded by at least workers, from Laurens (1908) to Lewey (1945). al findings have been a polyneuritis with various of degeneration and, less commonly, inflamma- uch peripheral nerves as have been sectioned and pinal roots. The anterior-horn cells are the next ften mentioned site of change (Holmes 1917, d et al. 1919, De Jong 1940, Lewey 1945), and 1927) and De Jong (1940) found the lesion l to these cells and the homologous bulbar Degeneration of the long tracts is less common been supposed to be secondary (Roseman and 1941). Honeyman (1937) found no significant ality in a detailed examination of the nervous in four fatal cases. Case 8 of the present series, the investigation is not yet complete, promises little. It must be remembered that in a disease not often lethal post-mortem evidence may be misleading.

DIFFERENTIAL DIAGNOSIS

oliomyelitis

usion with acute anterior poliomyelitis causes the ifficulty, but usually the clinical pictures of the two diseases are distinct. Holmes (1917) listed some of the most helpful diagnostic features, and subsequent experience has added to them: Dagnelie (1938) gives a good summary. The differences are as follows:

(1) Patients with Guillain-Barré syndrome are afebrile and paralysed when first seen. If it is possible to relate the onset to an obvious fever, such fever has usually developed two or three weeks previously. Patients with poliomyelitis are usually febrile at the onset of the paralysis and for a few days beforehand.

(2) In the Guillain-Barré syndrome paralysis spreads at times very rapidly, but more often slowly, whereas the paralysis of poliomyelitis is classically maximal at the onset, though it may extend, especially to the medulla, in rare instances.

(3) In the Guillain-Barré syndrome the paralysis is symmetrical, or perhaps ascends a little higher on one side. The proximal muscles are most affected in the limbs, and the trunk tends to escape. In poliomyelitis a single limb, two on the same side, or odd groups of muscles are often affected, as is the trunk.

(4) Subjective sensory symptoms are greater and more persistent in the Guillain-Barré syndrome than in poliomyelitis, but genuine objective sensory loss is not a feature of either disease.

(5) Recovery, though sometimes slow, is complete in the Guillain-Barré syndrome, in contrast to the residual paralyses which are pathognomonic of poliomyelitis. There is not usually much muscle wasting in the Guillain-Barré syndrome.

(6) The C.S.F. in the Guillain-Barré syndrome usually shows at some period an increase in protein without any increase in cells. In poliomyelitis there is typically first an increase in cells and later in protein; but an increase in protein may be the only departure from normal. Jervis and Strasburger (1943) described a fatal case which never had more than seven cells per c.mm. but in which the C.S.F.-protein level rose to over 1200 mg. per 100 ml. in the fourth week. Necropsy showed lesions of poliomyelitis. These workers had made a "tentative diagnosis of Guillain-Barré syndrome" and emphasise the difficulty in diagnosis, but the onset with maximal paralysis and a temperature of 102°F should have aroused considerable doubt. Nicholson (1946) described three cases of poliomyelitis in which the C.S.F.-protein level was 74, 67, and 54 mg. per 100 ml. on the seventh, fourth, and fifth day of the disease respectively, cells being 5 or less per c.mm. Isolated C.S.F. findings should therefore be interpreted with reserve.

From Other Polyneuritis

Rarely do other forms of polyneuritis present difficulty. Diphtheritic polyneuritis is marked by the causal infection, and, though the C.S.F.-protein level is often raised without cells, the distribution of the paralysis is different. In faucial diphtheria, for example, the local paralysis of the palate and the paralysis of accommodation appear first, and may still be present at the onset of general weakness. Facial palsy is not common in diphtheria.

The remaining forms of polyneuritis are classically accompanied by a normal c.s.f., but Boudouresques (1938) has pointed out that any of the infective varieties may on rare occasions show an increase of c.s.f.-protein. He summarised the infective forms as mainly motor and acute, and the toxic types as mainly sensory and chronic. There are obvious exceptions to this rule, but where paralysis is due to a metallic or organic poison it does not show the rapid onset and steady recovery found in the Guillain-Barré syndrome. Lead paralysis begins in the extensors of the wrist and is said to be greatest here even in the very rare case in which it becomes generalised. Alcoholic polyneuritis and the allied types due to aneurine deficiency occur in special circumstances and again do not show the same march of events as the Guillain-Barré syndrome; the c.s.f. was normal in sixty-nine alcoholic cases out of seventy examined by van Bogaert et al. (1938) and in one personal observation of mine.

TREATMENT

There is no specific treatment for the Guillain-Barré syndrome, and the tendency to rapid improvement makes the assessment of remedies difficult. The most important point is that the paralysis may involve the respiratory muscles and render artificial respiration necessary. Hence a mechanical respirator or "iron lung" is at times useful.

Aneurine.—Since the discovery of the effect of aneurine deficiency in impairing peripheral nerve function scarcely a case of polyneuritis has escaped the administration of this substance, and most of those described here are no exception. It is hard to say how much it assists recovery, but it is harmless.

Physiotherapy.—The benefits of physiotherapy are obvious and easy to understand.

Neostigmine.—Reports from America emphasise the value of neostigmine, which was tried because of a presumed analogy with poliomyelitis, where it is said to diminish muscle spasm. Test (1946) described a dramatic improvement in a woman, aged 22, within a few hours of its administration in doses of 0·5 mg. four-hourly; but the patient stayed two months in hospital, which is a fairly usual time for a case not so treated. Shaffer (1946) described a similar improvement in a boy, aged 8 years, treated on the same lines. He includes a graph of the maximal range of passive movement in various joints before and after starting treatment with neostigmine, and the increase recorded is considerable. Before treatment, however, measurements seem to have been made once a day, in contrast to eighteen times a day after it was started; hence suggestion possibly played some part. This child also spent two months in hospital. I am not impressed by the part alleged to be played by muscle spasm in the Guillain-Barré syndrome, and my trial of neostigmine did not produce sufficient benefit to encourage me to continue it.

SUMMARY

The description of polyradiculoneuritis by Guillain, Barré, and Strohl in 1916, subsequently modified by Guillain in 1936, is identical with that of the acute infective polyneuritis of English workers and the polyneuritis with facial diplegia of Laurens and American workers.

Its clinical picture is strikingly characteristic, and its recognition rests on this. Its features are a symmetrical flaccid paralysis with abolition of the tendon-reflexes and with well-marked subjective sensory symptoms without much objective change. The patients are afebrile but may have had an antecedent

Facial paralysis is common, but affection of cranial nerves unusual.

Complete recovery is the rule, but rarely may die.

An increase in c.s.f.-protein is usual but not nomonic.

There are no specific pathological findings neuritis and degeneration of nerve-roots may with occasional changes in the cord.

The ætiology is unknown, and the unproved.

Differentiation from poliomyelitis is impo not difficult.

Treatment can only be symptomatic.

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EFFECT OF PENTAMETHONIUM ON THE PERIPHERAL CIRCU

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The effect of pentamethonium iodide bistrimethylammonium di-iodide) in normal and tensive people has been discussed by Arnold and heim (1949). The presence in this country of Goetz enabled its action on the peripheral circul be studied with his digital plethysmograph. time available has allowed only eight persons to —two normal, two hypertensive, and four with vascular disease. The results obtained in these and the production of commercial preparations drug have prompted the present report.

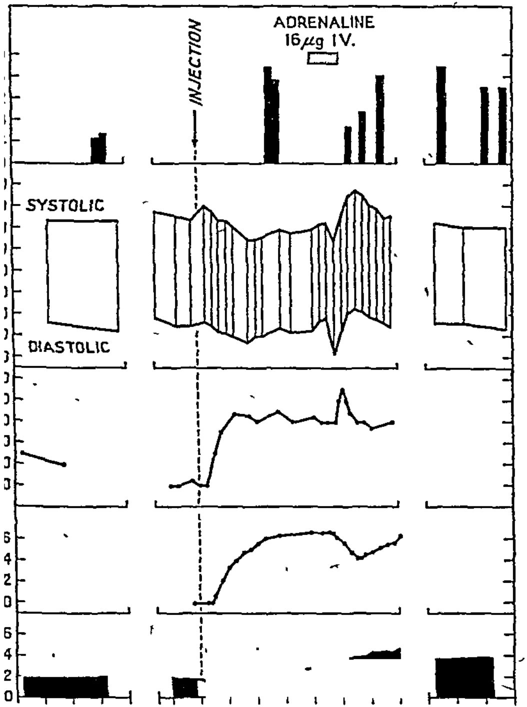
The value of continuous records of the pulse digital volume, and arterial inflow as measures peripheral blood-flow has been fully described (Goetz 1946, 1948, 1949). The digital plethysm permits the simultaneous recording of changes digits and also of respiration and skin te The pulse-rate can be obtained from the tracing some cases frequent blood-pressure readings were with a mercurial sphygmomanometer. The produced by pentamethonium iodide have been in the recumbent subject. The drug has been intravenously in doses of 40–50 mg. over a per 30 seconds.

RESULTS

The normal response to an intravenous dose of of pentamethonium iodide is shown in fig. 1, a graph prepared from the *continuous record.*

ume and digital volume begin to increase within) of the start of the injection, and full vaso- ı is reached within a few minutes. Vasodilatation or at least an hour and is accompanied by some in temperature. Immediately after the injection t-rate rises. In the normal recumbent person ittle or no fall in blood-pressure. Figs. 2 and 3 ngs from the records on which fig. 1 is based. e-volume in the big toes was doubled, rising from o ± 0·04 ml. (fig. 2). The increase in the rate al inflow, measured by the venous congestion tz 1946), is well shown in fig. 3.

nethonium iodide thus produces well-marked ıl vasodilatation. This can be counteracted with ıe. Adrenaline was given by intravenous drip rmal subject before and after injection of the . similar effect was observed on both occasions.) µg. of adrenaline was injected over a period minutes, eight minutes after the injection of



ıe effect of an intravenous injection of 50 mg. of pentametho- ıdide on the circulation of a normal man, and the effect of a ntravenous dose of adrenaline on the vasodilatation produced tamethonium iodide.

of pentamethonium iodide, there was a fall in nd digital volumes, a fall followed by a sharp rise l-pressure, and a further rise in pulse-rate (fig. 1). iew of the fall of blood-pressure it is known to e in patients with hypertension (Arnold and eim 1949), the effect of pentamethonium iodide peripheral circulation was studied in two such In the first the blood-pressure fell from 264/140 '104 mm. Hg after the injection of 50 mg. of the nd well-marked peripheral vasodilatation occurred . In the second patient there was a smaller fall d-pressure (from 260/154 to 214/136 mm. Hg) and ect on the peripheral circulation was much slighter. effect of pentamethonium iodide was studied in ıtients who had had either a cervical or a lumbar thectomy for peripheral vascular disease. In only se did the drug fail to produce some increase in volume, and this patient was examined when the vessels had not yet regained any vasomotor tone after the vasodilatation caused by lumbar sympathectomy.

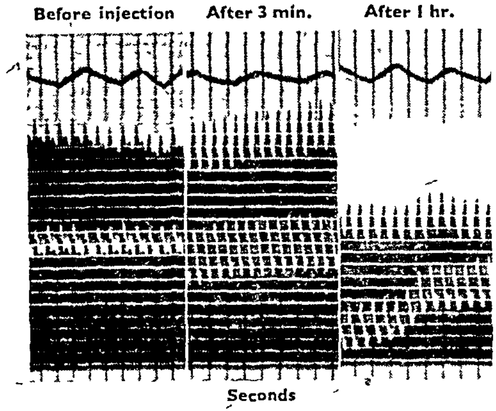


Fig. 2—Tracings obtained with the optical digital plethysmograph, showing the increase in pulse-volume following an intravenous injection of 50 mg. of pentamethonium iodide. The lower tracing records the pulse-volume of the left big toe, the middle tracing that of the right big toe, and the upper curve is a record of respiration.

That pentamethonium iodide may prove useful in the study of peripheral vascular disease is illustrated by the following case:

A woman, aged 43, was admitted to hospital with mild diabetes and intermittent claudication in the right calf. No pulsation could be felt in the right dorsalis pedis artery, but pulsation was readily palpable in the left dorsalis pedis and in both posterior tibial arteries. The flush of a reactive hyperæmia test reached the base of the left big toe in 4 seconds but took some 14 seconds on the right side.

The patient was given 50 mg. of pentamethonium iodide intravenously. Half an hour after the injection the pulse-volume had risen from ± 0·001 to ± 0·010 ml. in the right big toe and from ± 0·002 to ± 0·015 ml. in the left. During this time the skin temperature on the dorsum of the right foot had risen only 1·2°C, while that on the left rose 2·4°C. In the big toe the pulse-volume normally reaches at least 0·02 ml. in full vasodilatation (Goetz 1946). It was clear, therefore, that either the pentamethonium iodide had not achieved full vasomotor release or that arterial disease was present in both legs; but the change following the injection suggested that lumbar sympathectomy would improve the circulation in the right leg.

This operation was performed and the patient was investigated again eleven days later. At this time the right foot was warmer than the left. The pulse-volume, at rest, in the right toe (± 0·013 ml.) compared favourably with that obtained preoperatively after injection of pentamethonium iodide (± 0·010 ml.), while that in the left (± 0·002 ml.) was unaltered. After the postoperative injection of 50 mg. of pentamethonium iodide, the pulse-volume on the right side showed no material change, while that on the left rose

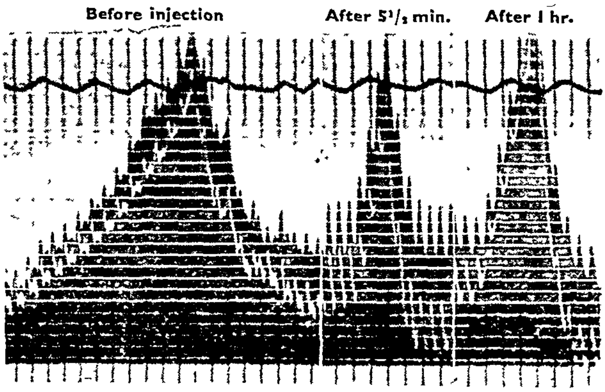


Fig. 3—Tracings similar to those in fig. 2, showing the increase in digital volume of the big toes during venous *congestion tests* before and after intravenous injection of 50 mg. of pentamethonium iodide in a normal man. The sharper rise in digital volume after the injection indicates an increased blood-flow.

to ± 0·012 ml. (fig. 5). Immersion of the hand in ice-cold water led to no change in the right but a considerable decrease in the volume of the left pulse. This suggested that 50 mg. of pentamethonium iodide had not blocked all vasoconstrictor impulses, but the injection of a further 25 mg. did not lead to a further increase in the left pulse-volume.

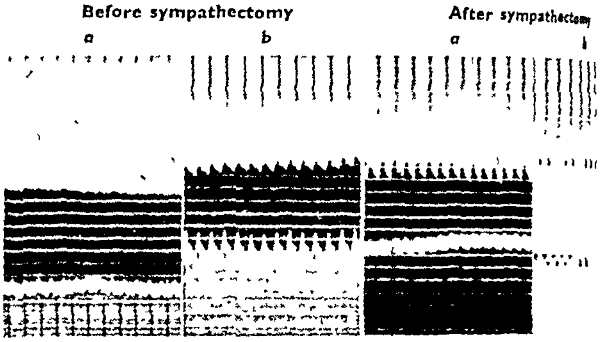


Fig. 5—The effect of pentamethonium iodide 50 mg., before and after lumbar sympathectomy, on pulse-volume in the right and left le of a woman, aged 43, with intermittent claudication in the right before injection; *b*, after injection. The upper tracing is from the the lower from the left big toe.

DISCUSSION

From a study of the effect of pentamethonium iodide in animals Paton and Zaimis (1949) concluded that it paralysed the transmission of impulses through the autonomic ganglia, having an action similar to that of tetraethylammonium salts. Arnold and Rosenheim (1949) found that the drug produced a fall of blood-pressure in hypertensive patients. This effect was, again, similar to that of tetraethylammonium chloride but lasted longer and was accompanied by fewer subjective sensations. This protracted action was also shown by the development of postural hypotension in a normal person more than an hour after injection.

Tetraethylammonium salts have been used in the investigation and treatment of peripheral vascular disease (Berry et al. 1946), but their value has been questioned (Boyd et al. 1948) because, with skin temperature and skin resistance as an index of vasodilatation, the results compared unfavourably with those following sympathetic block. It appeared possible that the protracted action of pentamethonium iodide would make it more useful than tetraethylammonium chloride in the investigation of peripheral vascular disease.

The effect of pentamethonium iodide on the peripheral circulation was therefore studied with the optical digital plethysmograph. In normal people peripheral vasodilatation has been demonstrated. This begins within a minute of intravenous injection, reaches its maximum within 3 or 4 minutes, and persists for a considerable time, being still present after an hour in one p The degree of vasodilatation, as judged by pleth graphy, could not be appreciated by recording the temperature, which responded rather poorly. confirms the contention put forward by Goetz (1949) that skin-temperature readings are unsatis in assessing peripheral blood-flow, and that es of arterial blood-flow in terms of skin tempera practically impossible.

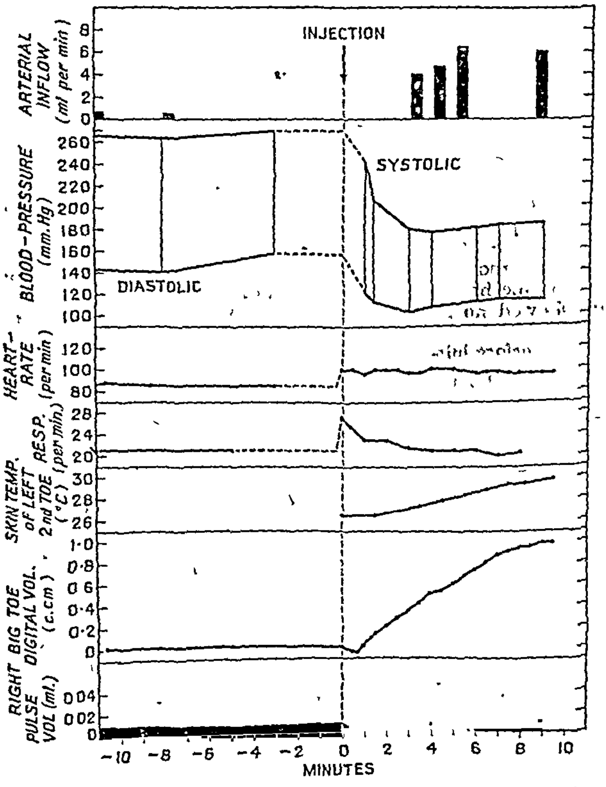


Fig. 4—The effect of an intravenous injection of 50 mg. of pentamethonium iodide in a woman, aged 47, with hypertension. The fall in blood-pressure coincides with well-marked peripheral vasodilatation.

In normal people the peripheral vasodilatation accompanied by little change in blood-pressure. patients with hypertension the vasodilatation coi with a fall in blood-pressure. Adrenaline counter this hypotensive action, and its effect on the peri circulation was investigated in a normal person the influence of pentamethonium iodide. Though a minimal intravenous dose of adrenaline was giv caused a definite rise in blood-pressure and a vasoconstriction. In this respect pentamethonium does not prevent the peripheral action of adrenaline

The effect of pentamethonium iodide has also studied in the sympathectomised limb. The occurrence some vasodilatation, when intrinsic vascular tone been regained, was unexpected, and the possibility some direct action on the peripheral vessels has been excluded.

The dose of pentamethonium iodide required to a all vasoconstrictor impulses has not yet been determ and we are now investigating the constancy and of its vasodilator action in peripheral vascular disease

SUMMARY

The peripheral vasodilatation produced by pe methonium iodide has been studied with the optical di plethysmograph.

In normal people vasodilatation begins within minute of injection and persists for at least an hour.

The value of pentamethonium iodide in the investi tion and treatment of peripheral vascular disease is being studied.

The pentamethonium iodide used in this investigation kindly supplied by the Wellcome Foundation. Our th are due to Mr. V. K. Asta, medical artist at Univer College Hospital medical school, for assistance in preparation of the charts.

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NCE OF STAPH. AUREUS IN THE TERIOR NARES OF HEALTHY CHILDREN

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T some knowledge of the incidence of a c micro-organism in the healthy body it is o assess the significance of the organism when diseased tissues, and to estimate accurately ces and importance of self-infection and ction.

long been recognised that *Staph. aureus* may be the nose and on the skin of healthy people; al. (1944), reviewing the published reports, timates of the nasal carrier-rate of *Staph. aureus* from 22 to 45%. These variations are no doubt ly to different sampling techniques and partly nces in the populations sampled. It is interesting that, whereas Miles et al. found a carrier-rate % among patients swabbed on admission to , they observed a significantly higher rate of among patients sampled during their stay in and 64% among the nurses.

nation about the incidence of *Staph. aureus* in es of children is relatively scanty, but both (1937) and McFarlan (1938) agree in finding ntly higher rates among children than among in hospital—i.e., 58·4% in children as against in adults and 57·5% as against 41·9% respec- Dr. A. M. Thomas and I (unpublished work, y Miles 1941) found that the nares of about f healthy infants born in hospital are infected *taph. aureus* within the first two weeks of life.

present survey of the incidence of *Staph. aureus* nares of healthy children was undertaken to find r there is a gradual fall in the carrier-rate with ing age. as suggested by the above results. n recorded a higher incidence (60·5%) between es of 13 and 19 than in either adults or younger n, but found no change between the ages of 12 years, though he states that there was "a sharp variation around the mean of 58·4%"; per, however, does not contain the figures upon he based this observation.

MATERIAL AND METHODS

population studied consisted of four groups of n.

up 1 comprised 156 children aged from 2 weeks years, whose noses were sampled within a few of their admission to hospital. This sample was cted but for the fact that children with signs or oms of infection of the upper respiratory tract excluded. It included 71 patients with congenital nities of the lip and palate, since no significant nces in nasal carriage were found between them ormal children.

up 2 comprised the entire population of a small ntial school of 40 children aged 3–15 years.

Group 3 was composed of 138 children, aged from 2 weeks to 5 years, attending an infant-welfare clinic; several of these children were swabbed on many occasions, but for the purposes of this survey the result of only the first swab has been included, though this was not always taken at the first attendance at the clinic.

Group 4 consisted of 112 babies aged from less than 1 hour to 2 weeks, from whom 255 swabs were taken in the maternity unit of a general hospital, where in the past several small outbreaks of impetigo neonatorum had taken place; there was no major outbreak during the four months (January–April) in which the survey was conducted, though occasional "sticky eyes" and three mild cases of impetigo were noted during this time.

Technique of Sampling.—The nose was sampled by passing a swab moistened with peptone water or nutrient broth through both nostrils; the skin by rubbing a moistened swab over a circular area, 2·5 cm. in diameter, on the back of the right wrist. The swabs were inoculated on to one half of a 5% horse blood-agar plate within $^{1}/_{2}$–2 hours of sampling. Plates were examined after incubation overnight at 37°C; all staphylococci were tested for coagulase activity by the slide technique (Cadness-Graves et al. 1943), and those negative by this test were tested in 10% plasma broth. All coagulase-positive strains were classed as *Staph. aureus* irrespective of their pigment formation or hæmolytic activity. Though the findings of Schwabacher et al. (1945) suggest that there may be a somewhat closer correlation between virulence and production of α lysin, it is certain that, by using the coagulase test only, most if not all of the potentially pathogenic staphylococci will have been recognised, because coagulase-negative strains do not produce α lysin (Schwabacher et al. 1945).

RESULTS

Carrier-rates in the First 14 Days of Life

The carrier-rates for the first 14 days of life were computed from data gathered in the maternity unit of a single hospital and can in no way be considered to represent a random sample of the infant population as a whole. Conditions in such units are very different from those of home nursing in that there is a greater risk of cross-infection.

The unit was housed in a block apart from the main hospital and contained a main 8-bedded ward of about 24,000 c.ft. capacity, one 2-bedded ward, and two single rooms; the infants were bathed in a common nursery. At the beginning of the survey swabs were taken daily or at two-day intervals; but, when it became evident that 90–100% of the children were already infected by the end of the first week, and since in no instance was a negative swab obtained in the second week once *Staph. aureus* was established, the routine was modified, and swabbing was mainly confined to the first few days of life to ascertain how quickly the nose was colonised with *Staph. aureus*. No accurate estimates of the daily carrier-rates can therefore be given after the fourth day. There was, however, a progressive increase from 8·6% on the first day to about 100% at the end of the first week, over 50% of noses being colonised by the third day (table I). These figures

TABLE I—NASAL CARRIAGE OF *Staph. aureus* IN THE FIRST MONTHS OF LIFE

—	Days of age					Months of age			
	0–	1–	2–	3–4	7–14	$^{1}/_{2}$–	1–	2–	4–6
children sampled ..	35	50	47	38	28	12	22	34	21
nd percentage (± standard error) carrying *Staph.* rus	3 8·6% ± 4·7	11 22% ± 5·9	26 55% ± 7·3	29 76% ± 6·9	27 96% ± 3·6	11 91% ± 8·1	13 59% ± 10·5	13 38% ± 8·3	8 38% ± 10·6

TABLE II—NASAL CARRIAGE OF *Staph. aureus* IN THE EARLY YEARS OF LIFE

—	Years of age					
	½–	2–	4–	6–	8–	10–15
No. of children tested	78	65	39	31	17	15
No. and percentage (± standard error) of carriers	18 (*23% ± 4·8*)	19 (*29% ± 5·6*)	15 (*38% ± 7·8*)	18 (*58% ± 7·8*)	*11* (*65% ± 11·6*)	9 (*60% ± 12·6*)

$\chi^2 = 24{\cdot}21$; N = 5; P = 0·001—i.e., similar differences between these groups would not be obtained by chance more than once in a thousand times.

approximate very closely to those obtained by Torrey and Reese (1945).

About 20% of the plates inoculated from swabs taken on the first day were sterile, compared with 4% and 2% on the second and third days respectively. The total growth on the first two days was invariably scanty and was composed for the most part of micrococci, non-hæmolytic streptococci, and diphtheroid bacilli, a finding in agreement with the work of Kneeland (1930) and Torrey and Reese (1945). A further interesting feature brought out by repeated swabbing was the rapid increase in the numbers of *Staph. aureus* appearing in the cultures; whereas only a few colonies of these organisms were generally isolated from the first positive swab, a profuse growth, often a pure culture, was invariably obtained within three days of this finding. Similar heavy growths were obtained from all except one of the swabs taken in the second week of life.

Carrier-rates in Infants Aged from 3 Weeks to 6 Months

Of the children examined in the first 6 months of life 95% were attending an infant-welfare centre; the remainder were patients sampled on admission to hospital. From the carrier-rates shown in the second half of table I it is clear that there was a rapid fall from 91·5% in the third and fourth weeks to 38·2% in the fourth and fifth months. It is uncertain what relation these figures bear to the general population, since 70% of the children attending the clinic were born in hospital, 35·5% at the same hospital as the infants of group I; 25% were born at home; and the remaining 5% were born in private nursing-homes. The number of home-born babies was, unfortunately, small, but the fact that one of two home-born children gave a negative swab in the first month and that all six were negative in the second month (table III) suggests that in these children the rates in the early weeks of life are lower than those of hospital children of the same age. No gross differences in carrier-rate were, however, apparent between children born in hospital and at home in the age-groups 3–6 months and 7–12 months.

TABLE III—COMPARISON BETWEEN NASAL CARRIER-RATES OF CHILDREN BORN IN HOSPITAL AND AT HOME

Age of child	Place of birth	
	Home	Hospital
2–4 weeks	1/2	9/10
5–8 weeks	0/6	13/16
2–8 weeks	1/8 (*12·5%*)	22/26 (*84·6%*)
3–6 months	5/10	10/23
7–12 months	2/9	2/8
3–12 months	7/19 (*36·8%*)	12/31 (*38·7%*)

Numerator = no. of children carrying *Staph. aureus*.
Denominator = total no. observed.
Percentages carrying *Staph. aureus* are in parentheses.

Carrier-rates in Children Aged from 6 Months to 1

The *Staph. aureus* carrier-rates in children a 6 months to 15 years were obtained from thr hospital admissions, an infant-welfare clin, residential school. The pooled carrier-rates groups (table II) show a gradual rise from children aged from 6 months to 2 years to children aged 9 and 10 years. Though the in each age-group in the three populations small for comparison between groups, it is signif the same rising trend was found in each popul

RELATION BETWEEN NASAL CARRIAGE OF AND INFANT

To determine whether the maternal carriage of *aureus* influenced the rate at which infants infected with this organism, swabs were tak the nose and wrist of 64 mothers within hours of admission to hospital, usually on the d delivery; 37 (58%) of the mothers were nasal and 8 (13%) were skin carriers of *Staph. aureus*

Table IV sets out the carrier-rates of infants days in relation to the carrier state of the Though for each day the carrier-rate was higher in the children of nasal carriers, the χ^2 test that these differences could readily have occ chance; and, whereas it is possible that, if larger were sampled, colonisation with *Staph. aureus* shown to be more rapid in the children of ca may be inferred with certainty that in this

TABLE IV—RELATION BETWEEN MATERNAL CARRI AND DAILY CARRIER-RATE OF INFANTS

Age of child (days)	Maternal nasal carriage			
	Positive children		Negative children	
	No.	% carrying *Staph. aureus*	No.	% carrying *Staph. aureus*
0– ..	12	*25·0*	8	Nil
1– ..	22	*22·7*	17	*17·6*
2– ..	26	*57·6*	12	*50·0*
3–4 ..	18	*88·3*	11	*72·7*

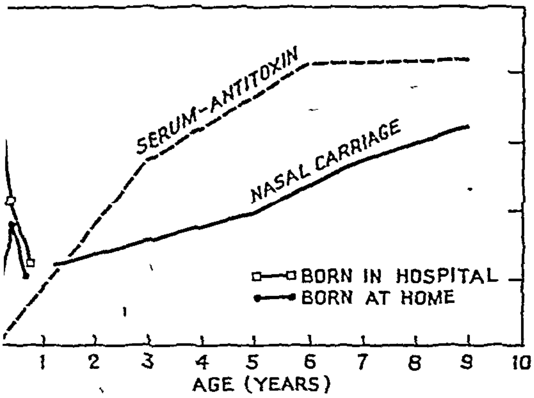
For whole group, $\chi^2 = 2{\cdot}0047$; N = 3; P = 0·6—i.e., d as great as these might be obtained by chance in three c samples of similar size.

factors were of greater importance in the col of infants' noses than was maternal infection.

This conclusion is strengthened by data o from an outbreak of neonatal impetigo in the sa twelve months later. Staphylococci of the same type (47B) were isolated from both the nose and of all six affected infants and from the noses of of six healthy children. Less than half the yielded positive nasal swabs; these strains were typed, but the odds would be very great again chance occurrence of staphylococci of the same type in the noses of more than one of these (Williams 1946). Most of the infants, therefore, have been infected from other sources. It is notew that type 47B was recovered from the wrists of four one of whom subsequently developed a whitlow which staphylococci of the same type were seven of ten nurses were nasal carriers of *Staph.* but from none of them were type 47B staphy isolated. The original source of the outbreak undiscovered; it is, however, highly probable th hands of nurses provided a ready vehicle for the of the infection.

DISCUSSION

The data presented here cannot be consider necessarily characteristic of a random sample o



ion of staphylococcal antitoxin levels in serum (Bryce and 1932) with nasal carrier-rates: interrupted line, percentage containing 40 or more arbitrary units of staphylococcal α in per ml.; continuous line, nasal carrier-rate of children.

opulation. The carrier-rates for the first two of life were estimated only for infants born in le hospital. However, conditions in this unit ot materially different from those found in most ity units, and there is considerable evidence to that similar high rates of nasal carriage obtain t hospitals. Thus, in unpublished investigations d rates over 80% in two other institutions, a f affairs similar to that observed in the New York al by Torrey and Reese (1945), and that observed unit investigated by Duncan and Walker (1942), *Staph. aureus* was found in the throats of 95% dren within 8 days of birth. Other investigations ernity units have largely been carried out during, r, outbreaks of staphylococcal infections; McFarlan reported a carrier-rate of 80% among 41 babies, whom had "pemphigus," and Dr. E. J. Stokes nal communication) found rates of 80–100% in ndon and numerous Hertfordshire maternity units. evidence from a small number of babies swabbed first and second months suggests that the nares t colonised with *Staph. aureus* with the same speed gularity in infants born at home as in those born spital. This might be expected on the grounds esser opportunity for infection; for, whereas the oir of *Staph. aureus* in the home is probably largely d to the nasopharynx and skin of the mother and in hospitals there is a vast pool of potential ion in the noses and on the skin of infected infants, ir fomites, and in the dust (Hobbs 1944, Knott laikley 1944). The evidence presented here indithat infants in hospital are not usually infected eir mothers but more commonly indirectly from babies, with the hands or clothing of attendants he air as probable vehicles of infection. A similar retation might be made of Duncan and Walker's) findings that staphylococci were usually found e throat of the infant earlier than in the breast-milk e mother. Further, by the serological and phage g of *Staph. aureus* Elliott et al. (1941) and Hobbs) have produced strong circumstantial evidence nurses who are persistent and profuse carriers may rise to outbreaks of neonatal staphylococcal infec-

It seems therefore highly probable that carriersimilar to those in table I are usual in hospital nts, and it is certain that infants are more often ted from the hospital environment than from their ers.

view of the work of Hallman (1937) the finding in this ey, clearly illustrated by the accompanying figure, gradual rise in the nasal carrier-rate for children aged 2 to 10 years was unexpected, as was the very low ence in those aged from 6 months to 2 years. This is of greater interest in the light of Dr. R. E. O. William's finding (personal communication 1947) of a gradual fall with age in the incidence of *Staph. aureus* in the noses of adults. Swabbing hospital outpatients on their first attendance he obtained nasal carrier-rates of 53%, 52%, 43%, and 38% in the second, third, fourth, and fifth decades respectively, and 45% for ages over 50 years.

It is tempting to speculate on these variations in the nasal flora. The initial high incidence in the first weeks of life, which is perhaps true only of children born in hospital, probably results from the entry of highly susceptible individuals into a heavily infected environment. That newborn infants are highly susceptible to *Staph. aureus* is borne out by the difference between adult and neonatal lesions and by the lack of localisation which characterises the severer types of staphylococcal infection in children. The low incidence of clinical staphylococcal infections among the mothers of infants with septic staphylococcal lesions is a striking feature of most outbreaks of severe impetigo neonatorum and suggests that this high susceptibility of infants is due mainly to a lack of cellular immunity, since at birth children are endowed with circulating staphylococcal antitoxin acquired passively from their mothers (Bryce and Burnet 1932, Murray 1935).

The fall in the nasal carrier-rate in the first two years may bear some relation to the fact that most young children live in a small closed community; immunity is perhaps acquired against the strains present in these surroundings, the subsequent rise in incidence being possibly the result of the child's gradually increasing contact with fresh strains of *Staph. aureus* in the outside world, particularly in a school community. The gradual fall with age of the incidence of *Staph. aureus* in the nares of the adult population, as noted by Williams, may be a reflection of an increasing immunity, but may, on the other hand, result from a less intimate contact with the community than occurs during school years.

It is interesting to compare the staphylococcal antitoxin levels found by Bryce and Burnet (1932) in human sera with the nasal carrier-rates for the same ages. The interrupted line in the figure summarises their findings; the rapid fall in antitoxin level in the first few months of life is, no doubt, due to a loss of congenital passive immunity (cf., diphtheria and scarlatinal antitoxin); the gradual rise in the age-group 2–10 years, however, bears a well-marked resemblance to that obtained by plotting the percentage incidence of *Staph. aureus* in the nose against age, but it is a matter for conjecture whether it is in any way related to the factors causing the rise in nasal carrier-rate in this age-group. Bryce and Burnet (1932) isolated white staphylococci of low toxicity from the skin of healthy people and suggested that such strains might play a part in bringing about this immunity; *Staph. aureus* of apparently normal toxicity, as judged by the coagulase test, will presumably have the same effect when carried in the nose. However, though it is possible that the nasal carriage of these organisms may be beneficial in stimulating defence mechanisms, it must be remembered that, as phage typing has shown, many wounds become infected with staphylococci previously carried in the person's own nose (Williams and Miles 1949); thus, if the staphylococcal α antitoxin is a response to the stimulus of the person's own nasal staphylococci, it does not appear to confer a very marked immunity to wound infection.

SUMMARY

The incidence of *Staph. aureus* in the anterior nares of 446 children aged from 1 day to 15 years has been surveyed.

In children born in hospital the nose was colonised with *Staph. aureus* very rapidly, the incidence increasing progressively from 8·6% on the first day to about 100% at the end of the first week.

After the age of a month there was a steep fall in the carrier-rate to 23·1% between the ages of 6 months and 2 years; thereafter there was a progressive rise to 64·7% at 10 years.

Evidence collected from a small number of children born at home suggested that in the early weeks of life the incidence of *Staph. aureus* in these children may be lower than that found in hospital children of the same age.

The sources and channels of infection are commented on and the relation of the staphylococcal carrier-rate to antitoxic and antibacterial immunity is discussed.

I wish to thank Dr. V. D. Allison for typing many strains of staphylococci and Dr. A. A. Miles for his continued interest and advice.

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SERUM-ENZYME CHANGES IN PERFORATED PEPTIC ULCER

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THE differential diagnosis between perforated peptic ulcer and acute pancreatitis is sometimes difficult. In previous times, the need for early operative treatment was considered equally clamant in both conditions, so it made little odds if the one was mistaken for the other before operation. Now that acute pancreatitis has come to be regarded as a self-limiting disease, this problem has assumed a different complexion. It is true that ordinarily a perforated ulcer can be confidently diagnosed at the bedside, but in the few atypical cases where doubt arises the surest way of deciding the issue short of laparotomy is to carry out one of the tests of pancreatic function. This investigation was prompted by the discovery of a case of perforation in which the serum diastase and lipase readings were so high and the symptoms and signs so obscure that an erroneous diagnosis of acute pancreatitis was made. The following are the salient features.

A middle-aged man, who had suffered from indigestion for many years, was seized with severe upper abdominal pain for 46 hours before his admission to the Glasgow Western Infirmary. When first seen there, his general condition was poor and his skin had a cyanotic tinge. The abdominal signs were those of a generalised peritonitis. The value for diastase was 740 Somogyi units per ml. of serum and for lipase 4·1 ml. of $N/20$ NaOH.

The patient was given morphine and intravenous glucose-saline, but he died two hours later.

At autopsy, an anterior perforation of the first part of the duodenum was found. There was widespread peritonitis. The peritoneal covering of the pancreas was congested and overlaid with patches of fibrin but the gland itself was healthy.

TABLE I—ENZYME READINGS IN 30 CASES OF PEPTIC ULCER IN ORDER OF DURATION OF

Case no.	Site of perforation	Duration of illness before study (hr.)	Serum-diastase (Somogyi units) (normal 70–200)
12	Stomach	2½	160
5	Duodenum	2½	46
2	Duodenum	3	177
26	Pylorus	3	145
28	Duodenum	4	..
9	Duodenum	4	145
29	Pylorus	4	..
15	Duodenum	4	53
7	Duodenum	4½	184
16	Stomach	5	133
21	Duodenum	5	76
4	Duodenum	6	65
10	Duodenum	6	84
18	Duodenum	7	88
17	Duodenum	7	66
14	Duodenum	7	355
30	Duodenum	7	..
25	Duodenum	7	168
23	Duodenum	7	106
22	Duodenum	8	106
20	Anastomotic ulcer	9	106
11	Duodenum	9	266
8	Duodenum	10½	248
6	Duodenum	11	66
13	Duodenum	11	266
19	Duodenum	12	88
24	Pylorus	12½	88
3	Duodenum	15 (died)	640
27	Duodenum	24 (died)	177
1	Duodenum	48 (died)	720

The patients were all male.

So far as can be ascertained, raised serum-lipase have not been previously recorded in this condition, there are two references to aberrations in the serum-di level. In a mixed series of 17 cases of perforated ulcer, Probstein and others (1939) noted a well-increase in the serum-amylase level in 4 patients these 4, 3 were treated surgically and no lesion from the perforation was found. A presumptive of acute pancreatitis was made in the fourth case and operation was therefore done. The patient died autopsy revealed a perforated gastric ulcer attached but not penetrating, the surface of the pancreas. ulcers in the other 3 patients with raised readings lay close to the pancreas, whereas all the other ca anterior perforation gave normal readings. On basis Probstein and his colleagues concluded that ro diastase estimations might not only aid in the recogn of cases of acute pancreatitis but would also help locate a perforated ulcer, if there was one. H (1942), on the other hand, has produced evidence disordered pancreatic function in cases of ant perforation. His studies were confined to the diastatic index. Out of 40 cases, he found 4 with siderably raised values. Each of these 4 patients operated on, with one death, and in none was there demonstrable signs of pancreatic disease.

Since it seems likely that the enzyme aberra described above might weigh against operation, ticularly if the clinical findings presented at features, it was decided to study the problem in m detail.

MATERIAL AND METHODS OF STUDY

The series comprised 30 cases of perforated pe ulcer. In each one the ulcer was situated anteriorly unrelated to the pancreas. The distribution of the les according to site was: duodenal 24, pyloric 3, gastric and anastomotic 1. All, except the one already refe to, were operated on and their perforations closed.

The *diastatic activity* of the blood was estimated by iodometric technique, described by Somogyi in 1938.

normal indices is 70–200 arbitrary units of diastase f serum. The range is wide, but the values for any son remain constant under physiological conditions. gly, the method is suitable for the detection of small s from the normal.

rum lipolytic activity was estimated by the Loewen- ethod as modified by Cherry and Crandall (1932). es are expressed in terms of the amount of alkali to neutralise any fatty acid resulting from the action rum lipase on an olive-oil emulsion. The range of was taken to be 0–1·5 ml. N/20 NaOH per ml. of which agrees with that accepted by Comfort and (1940).

COMMENT ON RESULTS

nzyme readings are given in table I. The cases to fall naturally into three groups: (1) the 13 during the first six hours, (2) the 15 studied the seventh and twelfth hours, and (3) the 3 r. In each of the first group, the chemical findings in the normal limits for both tests. Among those ne under observation during what may be called ical phase of their illness there were 4 with raised readings (cases 8, 11, 13, and 14). The tres were also raised in cases 13 and 14 but in the others. Of the 3 cases in the third group, gave normal enzyme readings, whereas the n the remaining 2—case 3 of fifteen hours' and two days' standing—were substantially elevated. ignificance of these results can only be appreciated paring them with those of cases of acute pancrea- recently published work in which the same tests nployed (Wapshaw 1948) the increase in the e activity of the blood in acute pancreatitis was o be greatest during the first few hours, the thereafter showing a steady decline. The return al levels occurred between the third and seventh he findings in two representative cases are given II.

I—ENZYME FINDINGS IN 2 PATIENTS WITH ACUTE PANCREATITIS

nosis	Time of observation	Serum-diastase (Somogyi units)	Serum-lipase (ml. N/20 NaOH)
subacute eatitis	6th hr.	5000	9·8
	3rd day	460	5·8
	6th day	220	3·0
acute rrhage reatic rosis	14th hr.	4000	5·0
	2nd day	2100	
	3rd day	475	0·5
	7th day	320	0·5

e who have carried out serial observations on cases is "colourless jaundice," as Garrod (1920) was say, have with few exceptions reported similar . Taking these figures as a measure of the n that may be expected in acute pancreatitis, it seen that there are only 2 perforation cases out 30 studied—cases 1 and 3—with findings that cause real difficulty in diagnosis.

t significance can be attached to the positive ? Do they really denote pancreatic dysfunction ? ns reasonable to infer from the analysis that itis, which usually sets in about the seventh hour leed caused death in the 3 late cases, may have he damaging factor. But further study of this ect of perforated peptic ulcer is needed before conclusions can be drawn as to its causation and cy.

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A METHOD OF CENTRAL STERILISATION OF SYRINGES IN HOSPITAL

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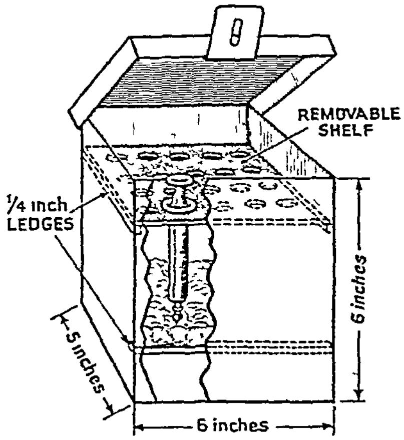
It is generally accepted that the usual methods of sterilising and storing syringes in hospitals are far from satisfactory, and the staffs of many hospitals are trying to organise a syringe service, if not a complete central sterilisation unit.

To prepare all-glass syringes by the method recommended by the Medical Research Council[1] means putting up each syringe separately in a glass test-tube. This method, though satisfactory in the laboratory and perhaps, with care, in small units, is cumbersome, time-consuming, and expensive for large hospitals. The greatest disadvantage of the test-tube method lies in the large number of 1 ml. syringes used. In some big hospitals it has proved impossible to provide individual packaging of the small syringes and needles in this way.



To overcome these difficulties, a simple method has been devised for sterilising many syringes together in a box. These boxes can be easily and cheaply made of copper, plated if necessary, with a hinged lid and hasp. Inside are two pairs of ¼ inch ledges, an upper pair running from front to back, and a lower pair running from side to side. All-glass syringes are hung through holes in a removable metal shelf resting on the upper ledges, with their needles mounted and plunged through a thick pad of gamgee tissue supported at the level of the bevels of the needles by the lower ledges, as shown in the accompanying diagram. This pad is made from a piece of gamgee tissue sewn over a rectangular wire frame and fits snugly all round to the sides of the box. For use, the cleaned syringes are dropped through the holes in the shelf, so that their needles penetrate the cotton-wool pad, and the box is sterilised in the hot-air oven for an hour at 160°C. The needs of each ward must be investigated, and boxes of an appropriate size to carry the requisite number of syringes to cover the average day's work can be made.

The needles are protected mechanically and bacteriologically by the pad of gamgee tissue, and the complete outfit will remain sterile for at least a day, even though the lid is often opened. In practice, it seems necessary for the set to be resterilised at the end of each day, and for each ward to have two boxes, one in use and one being sterilised. The ward personnel would then only need to rinse out a syringe after use and place it in a separate receptacle.

Hypodermic syringes (1 and 2 ml.) are conveniently sterilised in sets of twenty, in boxes measuring 6 × 5 × 6 inches, and twelve 5 and 10 ml. syringes can be accommodated in similar boxes if the depth is increased to 8 inches. It is unsatisfactory to sterilise large and small syringes in the same box.

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[1] Medical Research Council War Memo no. 15, 1945.

It may be thought, with reason, that the initial expense is against the introduction of such equipment; but, since most authorities agree that a centralised syringe service is ideal, the method here suggested involves no more expense than does the preparation of syringes in separate containers. On the other hand, adoption of the system should result in a great saving of labour and a reduction in breakages of syringes.

OVARIAN PREGNANCY

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THOUGH tubal pregnancies are common, pregnancies in the abdominal cavity occur much less often. There can be no doubt that many abdominal pregnancies start in the tube, and the fertilised ovum, instead of being conducted down to the uterus, is expelled in the reverse direction through the abdominal ostium as a tubal abortion. The ovum then falls through gravity into the pouch of Douglas, and this is what seems to have happened in the case recorded by Nicolson.[1] More recently Billington and Goodchild[2] have reported the remarkable case of a young native woman in Uganda who appears to have had a primary pregnancy in the left ovary and was delivered of a living child. Laparotomy was apparently performed at the request of the patient, and what proved to be the uterus had not unnaturally been hitherto regarded as a fibroid.

Though an attempt has been made to determine the incidence of implantation of fertilised ova in the peritoneal cavity, records of operations are insufficiently detailed to allow of division of these cases into those which are primary and those which are secondary to tubal abortions. Quilliam[3] states that about 11 reports of abdominal pregnancy have been published annually in the past thirty years, and he estimates that about 1 abdominal pregnancy occurs in every 12,500 pregnancies of all types seen in hospital practice.

True primary abdominal pregnancy must, however, be much more rare; and since the possibility of the implantation of a fertilised ovum on the peritoneum has not yet been satisfactorily demonstrated, it seems that all true primary abdominal pregnancies must be situated in the ovary. In the following case the pregnancy was in the left ovary.

CASE-RECORD

A primigravida, aged 33, was first seen at Boundary Park General Hospital, Oldham, on Nov. 18, 1947. She was then about 4½ months pregnant, the date of her last menstrual period being given as June 20, 1947. Six years previously she had been treated elsewhere for sterility. She was sent up to hospital because she was having a very slight daily loss of blood per vaginam, and her doctor had felt a mass in the right iliac fossa.

On examination she appeared to have a normal pregnancy, its size corresponding to the period of gestation. Nothing abnormal was noted except a smooth rounded mass about the size of a small orange in the right iliac fossa. This was considered to be a fibroid attached to the right side of the uterus and projecting into the broad ligament.

The patient felt perfectly well and had no suggestion of pain or discomfort. She did not intend to come into hospital for delivery but had placed herself under the care of a midwife who was her cousin. This relationship made the midwife particularly careful, and she therefore arranged for radiography to be done.

Radiography.—The patient was radiographed at Ashton-under-Lyne Infirmary on Feb. 23, 1948, and Dr. Blair Hartley reported as follows: "There is a single fœtus of some 30–32 weeks' development. It is attempting to present as an but the head lies well back and slightly over to the suggestion is therefore that there is some soft-tissue in the right anterior quadrant of the pelvic inlet. P prævia is therefore a possibility if not a probability."

Because of this report the patient was again sent to on March 5. The fibroid could still be felt on the but the head was entering the pelvis, and there reason to anticipate any trouble. More to allay appre than for any other reason it was suggested that the should come into hospital for delivery, and it was that she should attend the antenatal clinic.

On March 15, however, she was admitted to hospita emergency. She had been ill for about a week with and on admission had a temperature of 104°F. considerable respiratory distress, and tubular was heard at both bases. The patient looked toxic, albumin in the urine, and her blood-urea was 54 100 ml. She was doubtful about recent fœtal move the fœtal heart was queried. Penicillin was given and her temperature came down, her general condition improve. There seemed now no doubt that the fœtus dead, and a bougie induction was unsuccessfully by a resident obstetric officer. Previously, rectal ex by the midwife had shown that the head was well the pelvis, and no obstetrical difficulty was anticipated the patient did not go into labour, a further e was performed, and it was quite clear that the head the pouch of Douglas, and that the "fibroid" was in body of the uterus. The patient, however, was far too laparotomy to be considered, presenting a picture of toxæmia, which was attributable to protein absorption the dead fœtus. She died on March 29, two days expected date of delivery.

Necropsy (Dr. C. H. Adderley).—Though abdominal nancy had been diagnosed, when the abdomen was some of the onlookers thought there was a uterine p so closely did the mass simulate a normal uterus. The p situated on the back of the left broad ligament and on the left ovary, presented anteriorly, and where grew above the level of the broad ligament it was po reinforced by omentum. Running obliquely across the were the left tube and round ligament, and there adhesions to other abdominal structures. A well-de full-term male fœtus weighing 6 lb. was removed.

DISCUSSION

This case presents several features of unusual in There seems no reason to doubt that the p occurred in the left ovary, though unfortunat section of the sac was taken to prove the pres ovarian tissue. It seems certain too that a f living child could have been delivered had n mother developed influenza, the toxæmia from appeared to be responsible for the death of the Thereafter the patient developed signs of severe to apparently due to protein absorption from the fœtus lying in the peritoneal cavity. Billington Goodchild[2] obtained a living child in similar stances, and both in their case and in this one the was regarded as a fibroid.

Though such cases are extremely rare, it seems able, whenever an apparent fibroid is felt in pregn particularly in either iliac fossa, to entertain the bility of the pregnancy being ovarian; slight bl at intervals throughout the pregnancy gives addi support to the diagnosis. It is just possible that v examination early in pregnancy would have revealed abnormality; there is no doubt that late in pre the condition is most difficult to diagnose, es since the placenta is anterior and produces a la tissue at least equal in thickness to that of a n uterus. And this case proves conclusively that graphy does not help. There must be few films of full-term extra-uterine pregnancies in existence, and one was taken almost by accident. It is true that Dr. Hartley detected some odd condition and noted "s tissue structure in the right anterior quadrant of pelvic wall." The possibility of extra-uterine gest

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1. Nicolson, E. L. *Brit. med. J.* 1947, ii, 998.
2. Billington, W. R., Goodchild, R. T. S. *Ibid,* 1948, ii, 787.
3. Quilliam, T. A. *Post-grad. med. J.* 1948, 24, 482.

occur to the radiologist, and Dr. Hartley has me that, had the suggestion been made to him cian, he does not think he would have accepted as a very extreme possibility.

SIMPLE ŒSOPHAGEAL CAST

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AGEAL casts are exceedingly rare. Patterson ported a case and found records of 17 others, ck to 1877. No further examples have been since 1935.

son thought the most likely mechanism was a œsophagitis, followed by excessive epithelial ion, sporadic separation of the mucosa, ulcera- he cardiac end, and eventual invagination and of the cast. In the present case neither the or barium swallow suggests achalasia, but the trongly supports the idea that separation and begin at the cardiac end of the œsophagus. g to Beattie and Dickson (1943), mucosal d even casts are a well-recognised sequel to the g of corrosives, and some of the cases collected rson probably had similar causes—e.g., swallow- hloral, chloroform, very hot fluids, or neat l spirit (one case each). Sometimes it is doubt- was cause and which effect—e.g., the sticking s of bread or meat. In one case there was an e tendency. Usually there is no adequate ion. In 3 cases there was recurrence; two 1 case, and three casts in 2 cases. Casts have own to follow diphtheritic œsophagitis (Raw nd membranous œsophagitis may develop in acute and chronic conditions (Adami and 1910).

CASE-RECORD

nglish housewife of Huguenot descent, aged 40, ught up an œsophageal cast in 1933. During the years she expelled two more casts, and in 1948 cast. In the intervening ten years she twice had thought were premonitory symptoms, consisting of a, but casts were not shed.

h occasion there has been the same train of events. tely after her tea she develops a burning sensation he xiphoid process. This burning rises to the upper the sternum. Excessive saliva then begins to flow, e tries to swallow, but it is painful to do so, and the ems to stick half-way down. This stage lasts about hour. It is followed by a peculiar "turning over" in the abdomen; she is unable to swallow the y more, and she vomits up a "tube," which hangs r mouth but remains attached to the back of her On the first occasion she tried to swallow the tube could not do so; so she bit it through and swallowed that was left. On the second and third occasions the tube through with scissors. On the last occasion ulled the whole tube away.

ch time she has brought up a little blood with the tube rom half to one hour later has vomited about half a pint oodstained fluid. There has been no further vomiting ot on the last occasion, when she continued to vomit for a fortnight but brought up no blood; lying on her ide aggravated this vomiting.

ter bringing up the tube salivation continues. She to swallow the saliva but finds it causes so much retro- al pain that she gets rid of it into a towel or basin. Pain salivation becomes less after a fortnight, and after about weeks she feels normal.

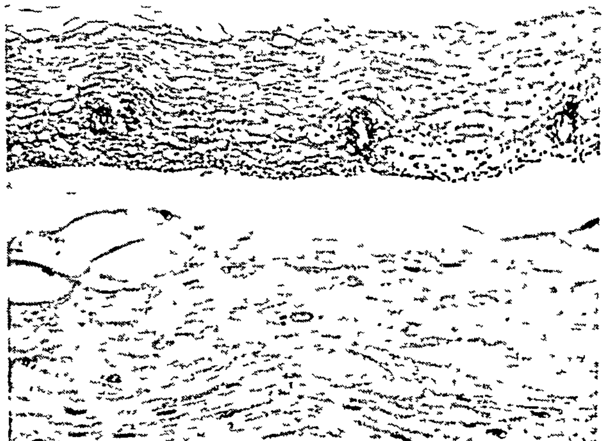
uring the first few days she takes only a little soda- r and milk. She then graduates through semi solids normal diet. The semi-solids—e.g., 'Farex,' 'Brand's nce'—at first seem to stick at about the level of the nd costal cartilage, causing pain just to the right of the num. Stretching the arms above the head and leaning backwards seems to help the food go down. In the early stages fluids are more painful to swallow than semi-solids.

The patient's general health is good. Between the episodes she has no dysphagia or dyspepsia. She has noted for three or four weeks before each episode a general swelling of the abdomen, the effect of which is that her clothes are tighter than usual round the waist. This swelling subsides when the cast is brought up. There is no associated pain or difficulty with swallowing. For about eighteen months in 1945–46 the patient had intermittent discomfort in the right hypochondrium, diagnosed as cholecystitis. It cleared spontaneously and radiography did not reveal gall-stones. She has never had any skin trouble or abnormality of the nails. She has not passed casts of the respiratory tract, bowel, or uterus. She is rather liable to sore throats, and has three or four attacks a year, but they are never severe. She has not had laryngitis. She eats a normal mixed diet and is fond of hot tea and coffee, but she does not take them unduly hot, she thinks. She also likes moderately hot pickles, which she eats only occasionally. She takes no alcohol and is a non-smoker.

Previous History.—She has had no serious illnesses. There have been two pregnancies: one in 1932 ended in miscarriage; one in 1943 was normal. Since then the patient has steadily put on weight. There is no family history of the passage of casts. Her mother had dyspepsia; her father and brother are well; a sister died of appendicitis at the age of 8 years; a half-sister is well.

On Examination.—An intelligent woman of obsessional type. Weight 11 st. 9 lb., height 5 ft. 1 ½ in. General appearance healthy. Skin, nails, and hair normal. No dryness or scaling of the skin. Oral mucosa, tongue, and teeth normal. Pharynx (four weeks after the last episode) a little injected. Tonsils small and pitted. No abnormal lymph-glands. Respiratory and cardiovascular systems normal. Blood-pressure 130/95 mm. Hg. Abdomen fat, with mild epigastric tenderness. No masses felt. No distension. Central nervous system normal.

Investigation.—Barium swallow normal in upright and semi-prone positions. No constriction or ulceration of œsophagus. With barium meal in the stomach there was no regurgitation into the œsophagus. Outline of the stomach showed a well-marked rugal pattern. Emptying normal and duodenum



Low power

High power

Section of œsophageal cast, lumen uppermost, showing tips of papillæ.

normal; some coarseness of jejunal valvulæ conniventes. Blood Wassermann and Kahn reactions negative. The patient was not willing to undergo œsophagoscopy. The temperature at which she drank a hot beverage five months after bringing up the last cast was 59·5°C; this is almost exactly the mean found in an investigation of 236 medical students, where two-thirds of the observations fell between 54° and 66°C (Hunt 1947).

The most recent cast was not examined because it had disintegrated by the time the patient came to hospital. The cast brought up in 1934 was examined at the West London Hospital and is a thin-walled tube about 8 in. long and ½ in. in diameter. Microscopically the wall is composed of layers of squamous epithelium only. Some of the cells are œdematous. Photographs of the section are reproduced (see figure). They show the typical appearance of œsophageal lining. There are no signs of inflammation.

ÆTIOLOGY

There are no obvious causal or precipitating factors in the present case. Three of the episodes occurred in September, and one in June. It is difficult to see any significance in this or in the fact that each episode has occurred after tea. The patient can offer no satisfactory explanation. Three episodes have been preceded by some mental strain: change to a responsible job; Munich crisis, and the loss of a favourite dog; and husband ill with a series of carbuncles. She has had other and more severe strains with no ill effects.

I wish to thank Dr. J. C. S. Paterson for permission to publish the case; Dr. F. Avery Jones for helpful advice; Dr. R. G. Waller for the pathological report on the specimen; Dr. J. M. C. Corrall for the radiological report; and Dr. K. Staynes for doing the drinking test.

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PERFORATED JEJUNAL DIVERTICULITIS

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Diverticulosis of the jejunum is an occasional incidental finding at laparotomy and necropsy. Since the contents of the bowel at this level are fluid, and the mouths of these diverticula are usually wide, inflammation in them is rare. In 1945 Walker reviewed 19 reported cases of jejunal diverticulitis and added 3 more of his own; additional cases have been recorded by Benson et al. (1943), Rudder (1943), Shutkin (1945), Scholefield (1946), and Williams and Walker (1946). The following case is therefore the 28th reported.

An agricultural labourer, aged 57, was admitted to the Radcliffe Infirmary on June 24, 1948. Three days previously, while working in the fields, he had developed a dull ache in the centre of his abdomen. He had continued working that day and the next, in spite of the central pain persisting and becoming stabbing. On the day of admission he had eaten his normal breakfast but could not work, because the pain, which had remained central, had increased. In the past year he had lost a stone in weight. Neither the previous history nor the family history was relevant.

On examination the signs of general peritonitis were present. Tenderness was most definite in the left lower abdomen, and, a straight radiogram giving no assistance, a provisional diagnosis of perforated colon diverticulitis was made.

Operation.—Under general anæsthesia a fixed mass was felt in the left iliac fossa. The abdomen was explored through a left lower paramedian incision. General peritonitis was confirmed, and a mass consisting of a loop of hypertrophied jejunum and pelvic colon was found. Fibrinous adhesions were gently separated, and a fæculent abscess was opened.

Excised segment of upper jejunum, showing several including one gangrenous and perforated.

Multiple diverticula of the jejunum were found, two forming part of the abscess wall. One was perforated and contained a fæcolith. The of jejunum began 40 cm. from the duodeno-jejunal the intestine both above and below the affected being normal. The loop was resected, end-to-end mosis was performed, and the wound was closed drainage.

Progress.—Convalescence was uneventful, and the returned home on the twelfth postoperative day. Si later he was in good health and had gained well over in weight.

The Specimen.—The excised segment consisted of of jejunum showing nine diverticula, all on the border and all projecting from the same side mesentery. The perforated gangrenous measured 5 × 4 × 3 cm. and had a neck 1 × A fæcolith occupied the greater part of the The narrow neck was not blocked, but possibly may have been caused by a "ball-valve" action, inflammation resulting, leading to gangrene and

COMMENT

Wasting appeared to be the only common ætiological factor in 4 cases of diverticulosis Rosedale and Lawrence (1936). Our patient a stone of weight in the past year, but this restored after operation.

van Ravenswaay and Winn (1943) state that symptoms of acute jejunal diverticulitis are most found in the left upper abdomen, or sometimes para-umbilical region. In the present case sym were most marked centrally and in the left lower

The formation of a concretion in an uninflamed diverticulum is rare. Walker (1945) stated that a tion had not been found in a case of jejunal diverti nor was one reported to be present in any of the cases we traced. Walker described a concretion inflamed ileal diverticulum. The presence of a conc in the inflamed jejunal diverticulum in the present appears to be unique.

We are indebted to Dr. G. A. C. Summers for the pho

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NTRAVENOUS PROCAINE FOR OSTOPERATIVE ATELECTASIS

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last few years much has been written about the uses of intravenous procaine, and the subject ntly reviewed by Mushin and Rendell-Baker.[1] g has been recommended as a drip-infusion to in in the postoperative period.[2] We have had erience of this use of the drug, but we formed ression that to obtain much beneficial effect it ssary to give quantities rather too near the danger rief intravenous injections seemed to avoid this since the administrator could watch for signs ty and immediately stop the injection.

f the main factors in the ætiology of postoperative sis is believed to be the patient's inability to iolently enough to clear the bronchial tree of is. For patients with postoperative atelectasis wing technique has therefore been adopted.

on as atelectasis is diagnosed, and provided the s general condition allows it, he is placed in a in his bed to encourage drainage from the portion of lung. The procedure is explained to d it is emphasised that success depends on his to cough vigorously and so clear his chest as ely as possible. Procaine is then slowly injected nously. The injection is continued until the feels " numb " or shows any signs of stimulation ervous system, such as dizziness, pins-and-needles hands or feet, or muscular twitching. When the l effect is obtained, the patient is told to cough; same time the side of the chest is percussed y to help shift the bronchial secretions. In s who seem unable to cough strongly enough by ry effort the larynx might be stimulated.

dose and rate of injection must be judged for se by the response to the drug; 20 ml. of 0·5% e is drawn up into the syringe, and about half of usually injected over 2–3 minutes. If possible, dle is kept in the vein during the coughing and ion. More procaine can be injected a minute or if the first attempt at clearing the bronchial tree t seem to have been successful.

ave not given barbiturates or any other drugs to against toxicity, feeling that they might mask scular twitching which is a valuable indication cient dosage. It is advisable to have a rapidly barbiturate, such as thiopentone, ready for iate injection if convulsions develop. We have ad to resort to this, nor have we tested the patient and for idiosyncrasy to procaine.

ommon with other forms of treatment for atelec- e success of procaine largely depends on its being within a few hours of the condition developing. nlikely to be of any benefit when atelectasis has stablished for several days, or when pain is not portant factor in preventing effective coughing. well be used prophylactically when there is a risk of atelectasis, and we have used it in this fter upper abdominal and thoracic operations.

have tried this method in many cases during the vo years and have been gratified by the results. ve noted no untoward effects, though we have at eared, when the patient has coughed very violently, recent abdominal incision might disrupt.

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[1] ushin, W. W., Rendell-Baker, L *Lancet*, 1949, i, 619.
[2] cLachlin, J. A. *Canad. med. Ass. J.* 1945, 52, 383.

Reviews of Books

Preoperative and Postoperative Care of Surgical Patients

HUGH C. ILGENFRITZ, A.B., M.D., F.A.C.S., formerly assistant professor of surgery, Louisiana State University. London: Henry Kimpton. 1948. Pp. 898. *52s. 6d.*

Care of the Surgical Patient

Including Pathologic Physiology and Principles of Diagnosis and Treatment. JACOB FINE, M.D., surgeon-in-chief, Beth Israel Hospital; professor of surgery, Harvard Medical School. Philadelphia and London: W. B. Saunders. 1949. Pp. 544. 40*s.*

THE non-operative aspect of surgical treatment is more important today than it has ever been. Research in such matters as shock, chemotherapy, burns, and thrombophlebitis—to mention but four of the subjects it touches—has widened the possibilities of treatment in the surgical wards, and added to the responsibilities of the surgeon. With further perfection of operative technique and with the greatly increased safety of anæsthesia, surgery is more adventurous than ever before, and so it is vitally important that the surgical team should know and use everything that can add to the patient's chances. There is so much that can be done to convert the poor risk into a good risk. The undergraduate must spend his clinical years learning the pathology and diagnosis of disease: the young resident is keen to acquire skill in operating; but the aim of the surgical team as a whole must be the ultimate safety of their patients. The enthusiasm of the team must, in the long run, be not for beautiful operations performed with a perfection of surgical technique, but for surgical wards filled with patients who are making smooth recoveries from major surgical procedures, and who will be discharged fit. The type of doctor who is capable of acquiring the most perfect technique may not be the same as he who can raise the therapeutic standards of his wards. Therefore it may be no bad thing that the scope of the non-operative side of surgery should be brought into the limelight by the publication of books dealing exclusively with the care of the patient outside the operating-theatre.

The two textbooks here reviewed are both by American professors of surgery, and both are written with enthusiasm. Professor Ilgenfritz, who aims at giving the physiological basis for every therapeutic measure described, has produced a detailed but very readable work. While it is no ready-reference book for house-surgeons, it will certainly appeal to the young surgeon who wants to base his treatment on up-to-date information. In the excellent chapter on postoperative complications, special care has been taken with the section on thrombosis and thrombophlebitis and the results of treatment with heparin and dicoumarol. Lung complications are also well described: but the six pages on postoperative retention of urine might be quoted as an example of over-enthusiastic thoroughness. Transfusion receives due attention, and the complications introduced by the Rh factor are well explained. The figures quoted as the *average* blood-loss in common surgical procedures—594 ml. in biliary-tract operations, and 808 ml. in radical breast amputations—are surely higher than even the most meticulous honesty could enjoin.

Prof. Jacob Fine covers a rather wider field in shorter compass. His introductory chapter on surgical diagnosis contains just those pearls of wisdom which will endear him to the young houseman. This book is essentially practical, and less theoretical than that of Ilgenfritz, though the physiological issues are covered quite clearly. The house-surgeon will find in it just the sorts of information he is always needing—for instance, a table of blood-chemistry tests and their normal values—and by such neat devices, enticing him on to read the text, it will educate him in surgical therapeutics.

Ilgenfritz, while very fairly discussing the advantages of early ambulation, leaves the final impression that it is just a little cranky, and the old way is best. Fine, on the other hand, has no hesitation in recommending that the adult patient should be out of bed the day after operation " regardless of age." Ilgenfritz, even if he allows his patient to get up, forbids him to sit in a chair; Fine has no objection to his sitting. Ilgenfritz relies a great deal on postoperative narcosis, and advises three-hourly narcotics to be given for two days after operation; Fine, in an excellent section on pain and sedation, forbids the administration of morphine for restlessness or apprehension.

Professor Ilgenfritz's book will appeal to the surgeon whose aim is to understand thoroughly the physiological basis of surgical therapeutics; Professor Fine's to the practical and inquiring mind whose concern is with the immediate clinical problem.

Diagnosis of Viral and Rickettsial Infections

Editor: FRANK L. HORSFALL, jun. A symposium held at the New York Academy of Medicine, Jan. 29 and 30, 1948. New York: Columbia University Press. London: Oxford University Press. 1949. Pp. 153. 21*s*.

THIS book comes close on the heels of another American publication, *Diagnostic Procedures for Virus and Rickettsial Diseases*, which appeared only a year ago and is also the work of a panel of experts. Comparison of the two books is inevitable. They are of a similar size (though not thickness) and could easily be mistaken one for the other. The earlier book, edited by T. Francis, jun., is rather more than twice as long as this one and covers a greater number of diseases; the prices are similar. In both volumes G. Rake has dealt with lymphogranuloma venereum, G. K. Hirst with influenza, and H. N. Johnson with rabies; otherwise the contributors are different. The earlier book gave very full accounts of the diagnostic procedures concerned and was therefore largely designed for experts: the Horsfall volume, on the other hand, describes the techniques more succinctly and readably and is directed rather to enlightening the student and the practitioner as to their uses and limitations. The practical value of the book is lessened by an extraordinary omission: in Great Britain the virus disease most urgently demanding laboratory help in diagnosis is variola; and for that we look in vain. Yellow fever too is omitted, though other tropical or exotic infections find a place.

Biometrical Genetics

K. MATHER, D.SC., PH.D., F.R.S., professor of genetics, University of Birmingham. London: Methuen. 1949. Pp. 162. 18*s*.

HOW to reconcile our knowledge of the behaviour of segregating hereditary traits with the genetics of characters showing continuous variation has perplexed many people. Mendel and Bateson exclusively studied segregating traits; Galton and Pearson, on the other hand, studied mainly the genetics of continuously variable characters like stature, head-shape, and intelligence. It is now generally believed that the genetical background of these and other continuous metrical characters is multifactorial; that is to say, they result from the cumulative actions of many genes, most of which have small effects on the particular measurements concerned. Professor Mather postulates that, besides the ordinary genes for segregating characters (major genes), there are also special genes responsible for continuous variation (polygenes). These polygenes have small additive effects and are assumed for the most part to be located in the heterochromatin of the chromosomes, which has usually been thought to be inert. Armed with this hypothesis, Professor Mather proceeds skilfully to analyse the results of some breeding experiments in plants and flies and to estimate how much of the variation in certain traits is due to genetical factors and how much is due to environment. The disturbances due to dominance of some genes over others and to linkage are ingeniously disentangled, though the phenomena of sex-linkage are not dealt with.

In human genetics, non-segregating traits are extremely important both in physical anthropology and in medicine. Susceptibility to disease, on account of diathesis or hereditary constitution, usually shows continuous variation, and probably can only be analysed genetically on a multifactorial basis. Professor Mather's demonstration of what can be done in randomly breeding systems, to which human populations approximate, follows with some amplifications the lines laid down by Fisher. The limitations of such methods in man, where environment is never homogeneous and mating hardly ever at random, are mentioned. Many readers may find th disagreeing with the author's assumptions nature of polygenes, and others will find the the subject too formal for their taste. His work however, stimulate further investigation of the of human metrical traits, which have been neglected in recent years.

Psycho-analysis

(2nd ed.) EDWARD GLOVER, M.D. London Press. 1949. Pp. 367. 15*s*.

THIS is a good deal more than a second edition epitome that appeared in 1939: it is now three times as long, and has a lengthy added cha "psychosomatic and allied disorders." The though more elaborate, exhibits the same vigour as before. Dr. Glover's well-known to the deviations from Freudian theory deve Mrs. Klein are discernible enough, but the tone book is not controversial. Doctors, social work students of comparative psychology, for whom is intended, will find it a well-organised, unco account of the theory of psycho-analysis which in this country until comparatively recently and still widely accepted among psycho-analysts

Die Primäre Tuberkulose bei Erwachsenen Kindern und ihre Entwicklung

Dr. Med. ST. J. LEITNER, Privatdozent für Medizin, der Universität Bern. Berne: Huber Pp. 157. Sw. fr. 15.

Dr. Leitner recognises three stages in the our knowledge, between the two world wars, progress of pulmonary tuberculosis. In the of this century the old view of the gradual an initial apical lesion still prevailed. Then, the result of the rapid improvement in X-ray te there followed the concept of a relatively acute the disease with an early infiltration (*Fr* the subapical region of the lung. Lastly the recognises as a third phase, beginning about concept of an early hæmatogenous apical spread a primary lesion elsewhere. With this new mind, and on the basis of an experience gained series of 266 cases examined in the University Berne, he has written an instructive account of tuberculosis and its development both in the in the adult.

The patients were followed up for 2–8 years their first admission to hospital. Complications and late, are recorded, and the results up to given. Dr. Leitner is impressed with the tuberculosis so often presents itself as an acute such as influenza or pneumonia, and from acute phase, with its tuberculin sensitivity, blood picture, and characteristic X-ray traces the disease through the stages of nodosum, pleural effusion, and the other post- stages, to the early hæmatogenous apical lesion insists that observation in hospital should not when the clinical manifestations of this acute subside and the blood picture returns to norm should be continued until radiography shows improvement, when the patient can be referred to the outpatient clinic. The value of sanatorium trea for the early lung lesion does not, in his opinion, of any doubt; and the claim for hospital trea other forms of the disease is, he believes, equally for though it will not always prevent the early togenous spread, it often will do so, and is the important safeguard. His experience of strepto treatment justifies some optimism.

Throughout the book he drives home the that observation must be continuous until healing place—too often a counsel of perfection in these bed scarcity. But readers will share his belief is an end to be kept constantly in mind.

The Proceedings of the International Congr Mental Health, 1948 (London: H. K. Lewis. 1949. Pp. 50*s*.), have appeared in four convenient paper volumes. Those who wish to refresh their memory was said during the congress by opening speakers discussion will welcome this full and careful compila

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THE LANCET

DON: SATURDAY, SEPT. 3, 1949

Research

hould not be misled by the fact that the earch' has now become a slogan to secure d private funds for activities sometimes ectable than fruitful." So says the president ockefeller Foundation.¹ What then do we research? PAUL FREEDMAN has made a tempt to answer this question, and anyone in research will find much stimulating n his small book, *The Principles of Scientific* FREEDMAN has had a long career in electrical research, and much of what he ugh applicable to physical research, cannot d in medical—especially clinical—research; hould like to quote some of his ideas and how they apply in the medical field.

ok begins with the history and philosophy ific research, and this differs notably from ry of science as a whole. Then follows a n the mental approach. "One of the greatest s between scientific and non-scientific men- he says, "is the care taken to avoid ted assumptions and baseless inferences." goes on to divide scientists into two groups: r, who accept all previous knowledge, and smaller group who recognise that existing knowledge is not completely valid or per- y true; it is only in the latter group that the ntists are found. This is not, of course, an itation to ignore all preceding work; you ppraise previous work unless you know about problem is how to acquire the necessary ge without having one's mind "set" in the This problem certainly arises in medical , and the trouble is that, unless they have science degree at their university, doctors d little training in the assessment of evidence drawing of conclusions at the level needed arch. This defect in training is responsible kness in what FREEDMAN calls "finalising" ch—i.e., knowing when the time is ripe for g the material and results and drawing ions or proposing a hypothesis.

> atience and thoroughness without ability to e can produce only an endless accumulation of which remain dormant. . . . Ability to finalise, ut the capacity for patient and thorough work, give at best a succession of brilliant ideas that unless they succeed in inspiring a more solid tigator; they are like flowers without roots."

les of both these faults can be found in most rs of specialist medical journals. FREEDMAN set out methodically the points of the correct approach to research problems. In medicine, ts very variable material, we cannot help g that a less systematised approach is better; dding medical researcher may well learn more from SINCLAIR LEWIS's *Martin Arrowsmith* than from FREEDMAN's rules.

Then there is the question of singleness of purpose and avoidance of frittering away time and resources on other understandably tempting activities.

> "It is not an accident that so many scientists engaged on research appear to develop blinkers which shut out so much that is worth seeing; not an accident that the wives and families of so many pioneers lived through years of poverty; not an accident that so many promising young scientists abandon the research they love, 'temporarily,' to earn more in other branches of activity where science is better paid, only to find that when at last their resources have become adequate nothing can give back the vanished years. It would be an impertinence to suggest to young scientists devoted to research what sacrifices they should make. But it is the act of a friend to tell them that, in this country at any rate, they may have to face the need to make sacrifices and may have to ask themselves whether these are worth while."

This is certainly true in medicine. The pure laboratory worker can devote himself single-mindedly to the inquiry in hand, but the clinical worker has always to consider the claims of his patient as well—and these often conflict with the research programme. The advent of the National Health Service has exaggerated another liability of medical research-workers, particularly departmental heads—attendance at committees. Professors of clinical subjects seem to be automatic choices for regional boards and similar bodies; yet, as WITTS has pointed out, if they are to fulfil properly their obligations to teaching and research they should not be spending time in this way when others, without their special responsibilities, are available. In addition to teaching and research, care of patients, and committee attendances, some undertake private practice as well. It is not surprising that few can do systematic research under such conditions; in any generation there are few men like JOHN HUNTER —and he succumbed to coronary occlusion. Then again, how can we hope to attract the right men into research when an adequately paid career in the National Health Service seems to depend so much on ascending the ladder by the prescribed route, and when better pay is offered at the higher grades —paradoxically better for part-time than whole-time work—than can be hoped for in a research career? The recent increases in the salaries of university teachers have gone some way to redress the balance, but the gap is still large enough to demand serious sacrifices, and this is particularly true of research grants and fellowships.

FREEDMAN's chapters on the planning and organisation of research are naturally taken from the field he knows; medical work can rarely be planned in such detail. He has much to say about team-work and about desirable and undesirable kinds of teams. He gives an amusing example of the "political" and the "Socratic" method of dealing with the earnest junior who thinks he has discovered an error in accepted teaching. He is not afraid to tackle the thorny question of giving credit where credit is due. BERNAL has said: "Perhaps the most convenient chiefs are those amiable scoundrels who establish a kind of symbiosis with their research-workers, choose good ones with care, see that they are well supplied with apparatus, attach their own names to all their papers, and when at last they are found out, generally

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lman, P. The Principles of Scientific Research. London: cDonald. 1949. Pp. 222. 15s.

logical complications to an operation which is already difficult enough. Moreover, material for a graft will not as a rule be available unless it has been stored, awaiting use, for some days or weeks beforehand. PEIRCE and his colleagues,[1] after recalling and appraising the great variety of storage methods hitherto tried, now suggest that the best results from vascular transplantation are to be expected from grafts which have been stored in the viable state. Their test of viability is to cultivate fragments of stored vessel in an adequate nutrient medium containing embryonic extract. The outgrowth of fibroblast cells and possibly of fibroblast-like endothelial cells from the explants, combined with orthodox histological examination, gives acceptable evidence of the grafts' well-being. The method of choice, they believe, is to store vessel segments not less than 1 cm. long in a 10% solution of homologous serum in a balanced and buffered salt solution containing sufficient penicillin and streptomycin to bring each to a final concentration of 50 units per ml. The temperature of storage, which apparently is not critical, should lie a little above freezing point, and the storage vessel, a simple conical flask, should be tightly stoppered. Viability is preserved for as long as seven weeks, and during the first three weeks the vigour of outgrowth from the test cultures may even exceed that from the control fresh material. These workers find that storage in diluted serum is superior to storage in plain salt solution or neat serum, or to storage in the frozen state after quick freezing.

Whether foreign grafts are acceptable remains as uncertain as before. In four trials of each, the same workers[2] grafted pig and baboon or human vessel segments into defects made in the abdominal aortas of dogs. One of the grafts of pig origin was functional after 30 days, and another after $4^1/_2$ months; the rest were more or less thorough failures. The conclusion arrived at is that the use of such heterografts might be practicable in some combinations between donor and recipient but not in others. The results were much more favourable with homologous grafts after varying periods of storage. Sixteen homologous grafts in dogs, with material which after storage for 1–70 days had been left in situ for two months or longer, gave results classifiable from a qualified "good" to a bald "excellent." Stored human vessel segments were then tried in nine children, eight of whom had a cyanotic type of congenital heart-disease; the grafts were used to shunt blood from the aorta or one of its branches into the pulmonary artery. A considerable fall of the red-cell count combined with improved exercise-tolerance was recorded in five cases after follow-up periods of 2–5 months; one patient did not improve; and two died, on the 2nd and 15th days after operation, though the vessel operation was not directly implicated. PEIRCE and his colleagues are already engaged on a fuller clinical trial.

A less encouraging experimental report has been published by WILLIAMSON and MANN.[3] They exchanged both arterial and venous transplants between the members of three pairs of dogs, each dog receiving one arterial and one venous graft of logous origin. Six venous grafts and four grafts were found to be non-functional when 56–62 days after operation; one arterial graft a functional state, and one other partly They conclude that, whereas autogenous tion of vessel segments is feasible, homologo *plantation is not yet justified.* The contradictory reports of these two types some variable other than a purely immunolo must govern the fate of homologous vessel The graft is mechanically most vulnerable the inflammatory process associated with the to foreign grafts is most intense—at the where native and foreign tissues unite. The of grafts may delay the onset of the reaction provoked by them (possibly by slowing vascular invasion) until union at the suture secure.

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[1] Peirce, E. C., Gross, R. E., Bill, A. H., Merrill, K. *Ann. Surg.* 1949, 129, 333.

[2] Gross, R. E., Bill, A. H., Peirce, E. C. *Surg. Gynec. Obstet.* 1949, 88, 689.

[3] Williamson, C. S., Mann, F. C. *Arch. Surg.* 1947, 54, 529.

Annotations

POLIOMYELITIS AND TONSI

THE St. Pancras coroner has lately investig death of two young brothers, aged 7 and 4 years developed polioencephalitis soon after their tons removed. Tonsillectomy was performed on Aug. 5 child fell ill on the 18th and the other on the the inquest a medical witness cited the warning by medical officers of the Ministry of Health in when the incidence of poliomyelitis was high,[1] that is "overwhelming evidence that a recent t increases the risk of a child contracting p particularly of the bulbar type; where p prevalent operations on the nose and throat s possible, be postponed."

Not everyone holds with this advice. At the meeting of the British Medical Association last view seemed to be that the risk, if it existed, was n as to call for prohibition of the operation.[2] Dr. McFarlan, however, said that recent tonsill increased the danger of the disease assuming the form, and asserted that during epidemics abstenti the operation might eliminate some of these severe though it might not reduce the risk of clinical i with the virus. And Dr. Stanley Banks[3] claimed the prohibition of tonsillectomy was the only preventive measure.

The facts pointing to enhanced risk from ton have been marshalled by Glover,[4] whose experience in North America suggests that tonsillec (recent and possibly remote) very probably incre risk of clinical infection with the virus, and th certainly increases the risk of the dangerous bulbar Glover quotes, among others, Anderson's[5] review [illegible], where it appeared that [illegible] had an attack-rate more $2^1/_2$ times greater, and a chance of getting the type 16 times greater, than other children.

In relating such reports as this to the death of the London boys, it has to be borne in mind that this outbreak has been characterised by an unusual numb multiple cases in families[6]; and the coroner re attribute the two deaths directly to tonsillect Nevertheless this tragic incident may increa ice to operate when poliomyelitis is abroad: and etter on another page Mr. T. B. Layton comes :rongly on the side of waiting until the disease is er prevalent.

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[1] *Lancet*, 1947, ii, 155.

[2] *Ibid*, 1948, ii, 72.

[3] *Ibid*,

[4] Glover, J. A. *Mon. Bull. Min. Hlth, E.P.H.L.S.* 1948, 7, 1

[5] Anderson, J. A. *J. Pediat.* 1945, 27, 68.

[6] *Lancet*, July 16, p. 22.

CASUALTY WAITING TIMES

ıe busy casualty officer diving from case to case e spent by patients in waiting for his attentions ke the twinkling of an eye; to the sick or injured sitting on a bench, any delay seems interminable. ive judgments, however, are out of place when a can be measured by the clock. Mr. Patrick n, F.R.C.S., has found out exactly how long s spend in the "front surgery" of Guy's Hospital raiting for examination, primary treatment, and l.[1] The general impression of the medical and staff was that most people spent less than two n the surgery, and that if a patient spent more ur hours there it was due to something avoidable. ours, at first blush, seems a good long time for or injured person to sit, or even lie, about; four altogether too long. Yet analysis shows that not squandered by the examining officers.

rding to established routine the patients (unless re ambulance cases) enter and sit in the hall. ırse sorts them into the sick and the injured, their temperatures, and enters the personal lars of each patient in the surgery book and on , which she gives to him. He then waits until een by a dresser who takes his history, examines ests his urine, and takes his blood-pressure. Half tients were seen by a dresser within ten minutes ving in the surgery, and 80–90% within half an The dresser, having examined his patient calls patient officer (O.P.O.) who also examines him, and ssary fills in a form for the X-ray department. ver 60% of patients were seen by the O.P.O. within minutes of arrival, and 70% within forty minutes. iography is needed the patient then walks, or is , to the X-ray department; and when the film een taken returns to the surgery to wait for its y and examination, by the O.P.O. The time spent X-ray department proved to be uniformly short: er 80% of patients the X-ray examination was ete within ten to thirty minutes of reaching the ment; less than 5% spent fifty minutes there, one over seventy; and this included cases, by no uncommon, of multiple injuries requiring several of skull and spine which could not be taken in less orty-five to fifty minutes. Allowing for the time by the patient in getting to the X-ray department o fifteen minutes) and the time required for the of the films and their examination by the O.P.O., 0% of patients radiographically examined spent tra hour in the surgery; and no great reduction average time, Mr. Clarkson thinks, can be expected ut sacrifice of proper care. Once the diagnosis is l, treatment—which, in the case say, of a hand , may include a twenty-minute toilet of the wound, full-dress repair in the theatre under anæsthesia— s, and after this the patient goes to the injection for antitetanic serum and penicillin. If he is go home he then returns to the desk for his card to mpleted; if not he may wait to be admitted or sent elsewhere. Those needing a hospital bed apt to wait longest: 5 cases (0·3%) out of 1500 ed waited over five hours on this account; but no they waited in comfort in the rest and observa- oom. Only 103 (7%) spent more than three hours e surgery, and most of these were patients who ed prolonged observation.

e analysis shows clearly enough that from the ors' point of view no time is wasted: every stage of the admission and examination procedure has its purpose and is designed for the ultimate benefit of the patient. On the other hand, upwards of two to three hours spent on a hard chair or bench in a draughty admission hall, alongside an outer door in constant and noisy use, must seem long to a patient with an aching head, a lacerated hand, or a crushed foot. What is needed, at Guy's as elsewhere, surely, is a comfortable casualty waiting-room, furnished perhaps with tubular deck-chairs, and tubular-and-canvas arm-rests and leg-rests, and certainly (like the torture chamber in *The Gondoliers*) with all the illustrated papers.

DISEASE FROM DOMESTIC ANIMALS

BOTH cats and dogs, though more resistant than man, are susceptible to tuberculosis. Cats are mainly affected by the bovine type of tubercle bacillus, probably derived from raw milk, whereas dogs are more commonly infected by the human type. With "open" lesions of the lung, intestine, or skin, large numbers of bacilli may be disseminated. Speaking at the annual Veterinary Congress last month, Dr. J. Winsser, of Leyden, remarked that in Holland, as in Britain, small domestic animals commonly live in close contact with adults and children; sometimes they sleep in their owners' beds and even receive food from their lips. Dr. Winsser himself developed a tuberculous ulcer of the finger, due apparently to infection from a dog; and dogs and cats have been found at necropsy to be suffering from the same type of tuberculosis as patients in the owners' families. In most of the bovine-type cases, however, a common source of infection seems the most likely explanation, and where the human type is implicated the disease is probably transmitted from man to animal.

Leptospirosis, especially the variety caused by *Leptospira canicola*, is very common in dogs; in Britain surveys have revealed evidence of past infection in up to 40%.[1] When they become infected many of these animals show no symptoms of disease but become healthy carriers; the leptospiræ establish themselves in the kidney tubules, and are shed in the urine; finally the organisms die out, but for some months the dog is a source of danger to other dogs and to man. Cases of canicola fever are now being recognised more often in this and other countries. In its early stages the disease often resembles poliomyelitis, and the possibility that the two conditions may be confused has lately been discussed in these columns.[2] An interesting report[3] from Holland describes how a laboratory worker became infected with *L. ballum*—a species hitherto found only in its carrier host, a field-mouse (*Mus spicilegus*). Investigation showed that a high proportion of healthy, tame white mice from certain dealers were excreting this organism, though other stocks were completely free. Of late years salmonellosis has been diagnosed in a number of cases of enteritis among dogs, and to a lesser extent among cats. *Salmonella typhi-murium* is the organism most often isolated, but Winsser lists over twenty other salmonella types which have also been found. Only rarely, however, has food-poisoning in man been traced back to infections in dogs. The danger of contracting psittacosis from imported psittacine birds has been eliminated almost completely by appropriate regulations, but a closely related virus which is carried by pigeons is known in England and some other countries and has recently been isolated by Dr. Winsser in Holland. Complement-fixation tests indicate that in the Netherlands this "ornithosis" virus is widespread among pigeons, especially the homing varieties. Though less virulent for mice and men than

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[1] *Guy's Hosp. Gaz.* July 16, 1949, p. 218.

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[1] Joshua, J. O., Broom, J. C., in a discussion on leptospirosis at the conference. Stuart, R. D. *Vet. Rec.* 1946, 58, 131.

[2] Alston, J. M., Broom, J. C. *Lancet*, Aug. 13, p. 306.

[3] Wolff, J. W., Bohlander, H., Ruys, A. Ch. *J. Microbiol. Serol.* 1949, 15, 1.

true psittacosis, it has caused pneumonia in pigeon-fanciers and their families. Fungal infections of the skin are very common in animals, and many are readily communicated to man, producing ringworm of the naked skin. The lesions are easily and rapidly cured, and the condition should perhaps be looked on as a minor inconvenience rather than a disease. Winsser notes the possibility of transmission of streptococci, *Tænia echinococcus*, and toxoplasms from dog to man. Mention should also be made of the rôle of dogs as reservoirs of *Leishmania infantum*, the cause of infantile kala-azar along the Mediterranean littoral, and of *Trypanosoma cruzi* which produces Chagas's disease in South America. But his most unexpected omission is rabies. In time past, and even now in many countries, this disease would be given pride of place as the most dangerous member of this group.

It appears that rabies and psittacosis are the two diseases communicated to man from household pets that can constitute a grave risk to life. In Britain at least, regulations have been framed and administered so successfully that the risk of these infections is now negligible. This central legislative action has been effective because the general public appreciates its value, and, with a few exceptions after the first world war, has not tried to evade its application. Infantile kala-azar, Chagas's disease, canicola fever, and food-poisoning provide public-health problems of a different type, and they can probably best be handled at the periphery—by close liaison between veterinary and medical practitioners. Thus, while our pets may from time to time unwittingly cause us hurt, they cannot be accused of conspiring to destroy us.

CURARE IN SPONDYLITIS

In rheumatoid arthritis and the allied condition of ankylosing spondylitis the pain gives rise to a reflex protective muscle spasm, and this in turn, though it *splints the affected joint or segment of the spinal column* more or less effectively, also produces a good deal of pain and stiffness. A self-perpetuating circle is set up, and the reflex arc concerned develops a lowered threshold which means that normally minimal sensory stimuli will excite further spasm. It was natural that the introduction of curare and allied drugs into clinical practice would lead to attempts to interrupt this circle, and earlier reports on *d*-tubocurarine for the spasticity of cord injuries and other conditions have been given by Schlesinger.[1] Schlesinger used an oil-wax suspension of the drug to produce a continued relaxing action, and now Norcross and others [2] describe results with a similar *preparation in ankylosing spondylitis.* They gave a 3% suspension of *d*-tubocurarine chloride in a mixture of wax and peanut oil, starting with a small dose at intervals of 24 hours or less and finally establishing an optimum maintenance dose given every 72–96 hours, which was just enough to abolish clinical evidence of spasm. In spite of the potential dangers of setting up a body depot of more than twice the therapeutic dose, they did not experience any major toxic manifestations, though it is necessary to be prepared to deal with these. Minor troubles—diplopia, myasthenia, or dysphagia—respond at once to neostigmine, but major respiratory distress might well require tracheal intubation or even artificial respiration. The 6 cases treated benefited considerably. Electromyography demonstrated a lessening of motor-unit activity; pain and spasm were reduced or relieved, movements improved, and spinal deformity partly corrected.

It is difficult at the moment to assess the p
indications for such treatment, other than as an ad
when other therapy has failed, but it would be a
the rather remote prospect of greater supp
cortisone [3] damped enthusiasm for further resear
this field. Clinical practice in this country with
drugs, such as mephenesin ('Myanesin') confirms tha
have some value in Still's disease and rheumatoid ar
generally, and more work on these lines seems
required.

ESTIMATION OF STREPTOMYCIN SENSITIV

In estimating the streptomycin sensitivity of a
of tubercle bacilli infected material is first ca
on solid medium and the organism then grown
liquid Tween-albumen medium of Dubos and
If a nongranular inoculum can be obtained i
way it is sown into a series of tubes of the liquid m
containing varying concentrations of strepto
and the sensitivity of the strain can be reported
later. The test takes about 2 months—a long w
a laboratory report even in such a chronic dis
tuberculosis. Another disadvantage is that
resistant mutants may flourish in the liquid m
containing streptomycin and thus mask the real
tivity of the mass of the infecting organisms. To
come these *difficulties Holt and Cruickshank*
added streptomycin, in suitable concentratio
tubes of the medium used for primary isolation
bacilli. Streptomycin may be added before o
sterilising the medium but the potency of the an
is reduced by about a third on heating. Specim
sputum from 68 hospital patients, none of whom h
streptomycin, were homogenised by the Jun
technique and inoculated on one tube each of Lowe
Jensen medium with and without streptomycin.
were 60 positive cultures from these patients
also grew on the medium containing strepto
In no instance, however, was the amount of
as great or its appearance as early as on the corre
ing culture without streptomycin. When the t
bacilli grew on the streptomycin-containing m
growth appeared so late and so sparsely in com
with the control medium that there was little d
in saying that the strain was sensitive in 3–4
When known streptomycin-resistant strains were c
in the same way the growth was practically id
on the two slopes. Some difficulty was encountere
tubercle bacilli were present in very small number
inoculated material, and it was considered advis
subculture and repeat such tests. In another
40 specimens of sputum, from patients on strept
therapy, were inoculated on solid media con
10 and 30 units of streptomycin before sterilisati
the results checked by sensitivity tests in the
Tween-albumen medium. Both methods gave
tively similar results. The fluid medium gives
accurate end-point, but the method described b
and Cruickshank is sufficiently accurate for
purposes and it avoids the danger of judging the ch
of a whole bacterial population by the additior
few persistent offenders.

In Australia Anderson [5] has used a similar tec
for assessing the streptomycin sensitivity of strai
solid medium with potato agar as base. She poi
that the method of homogenisation of infective m
is important in such tests because if the bac
unevenly distributed in the inoculum false rep
sensitivity may be made. Pathologists are famili
positive cultures on only one tube of solid mediun

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[1] Schlesinger, E. B. *Arch. Neurol. Psychiat.* 1946, 55, 530; *Bull. N.Y. Acad. Med.* 1946, 22, 520.

[2] Norcross, B. M., Robins, H. M., Lockie, L. M. *J. Amer. med. Ass.* 1949, 140, 397.

[3] See *Lancet*, Aug. 27, p. 399.

[4] Holt, H. D., Cruickshank, R. *Mon. Bull. Min. Hlth, E.*
May, 1949, p. 103.

[5] Anderson, P. M. *Med. J. Aust.* 1949, ii, 154.

oes have been given what was considered to be ical inoculum. This usually happens when the e scanty; it may occur when they are numerous. ı found that viscous sputum could best be ised with a few drops of normal sodium hydroxide n submitted to acid digestion. Whether this is as satisfactory as the Jungmann technique fying sputum it is difficult to know but it is emember that all such methods probably have a ect on the tubercle bacillus.

er rapid method [6] of performing sensitivity tests ubercle bacillus is to use a modification of the ture technique of Pryce. Material is smeared surface of slides which are then immersed in lbumen medium containing varying concentra- streptomycin. After incubation at 37°C for stained smears are compared with samples without streptomycin. This method may be ith pure cultures or with heavily infected material ot likely to help when there are few bacilli in the material.

hever method is used it is necessary, as the n Trudeau Society insists, to isolate and study of the infecting strain before a patient is subjected tomycin therapy. Halving the time taken for ity tests should help to foster this collaboration ward and bench worker.

THE MENTAL HOSPITALS

Minister has disclaimed only five mental hos- Manchester Royal Hospital; Cheadle, Cheshire: od House, Gloucester; St. Andrew's Hospital, mpton; and the Retreat, York. Bethlem Royal the Maudsley Hospital in July, 1948, to form a nit which is designated as a teaching hospital; lical school forms the institute of psychiatry in tish Postgraduate Medical Federation of London sity.

eir report [7] for 1948 the Board of Control note he number of patients under care remained ably steady: 144,725 in 1948, compared with in 1947. Some 97% of these were in hospitals in the Minister of Health. Last year the board d [8] that at the end of 1947 the number of patients ic wards overcrowded "on the basis of recognised rds" was 14,668, compared with 16,662 at the 1946. This year the figure has evidently risen, y state that the overcrowding in former county rough mental hospitals at the end of 1948 was compared with 11·7% at the end of 1947. Over- ng is still attributed to lack of beds and staff, and ard report that at the end of 1948 the Mental . Service was still denied the use of 3034 beds, lly diverted to the E.M.S. or Service Departments r-time purposes, and not yet returned. Moreover, eds are not in use because of the scarcity of , and 2694 beds are "in process of reinstatement." ill staff be available when they have been ted?

year the board made the encouraging announce- hat, in 1947, 54·5% of the total of 39,223 admis- were of voluntary patients. It is not possible to te from the figures given this year what the tage of voluntary admissions was in 1948: it vell be lower. The figures given throughout the are somewhat scanty. This is probably due, as ard explain, to "the absence of detailed information movement of persons suffering from mental er in former public-assistance institutions and public-health general hospitals now designated as mental hospitals, and in premises not vested in the Minister of Health but deemed to be mental hospitals." The year under review was one of great changes, and no doubt the board were working under difficulties: nevertheless the medical profession and the public need to have a full and clear idea of what is happening in the mental hospital service, and would welcome a much more detailed account next year. Overcrowding deserves particular consideration, for it can aggravate existing mental illness and hinder recovery. For this particular evil the pleasant social activities described here—music therapy, art classes, whist drives, concerts, and other entertainments or occupations—are no remedy.

The board note that medical certificates of insanity are often inaccurately or incorrectly filled in—just as they were when the Commissioners of Lunacy reported to the Lord Chancellor in 1846. A study, made in 1948, of 6156 admission papers of temporary and certified patients led to 384 being returned for amendment on medical grounds and 1291 for amendment for technical reasons—not a very reassuring finding for the mentally sick and their friends.

THE KING'S FUND

"Menus for patients on light or special diets are seldom planned," the fifty-second annual report [1] of King Edward's Hospital Fund for London notes in a section on hospital catering. Those on light diet get an unchanging midday meal of steamed fish, mashed potatoes, and milk-pudding. No cooked dish is provided for their supper, and the diet must often be inadequate as well as monotonous. As the report points out, patients on light diet need highly nutritious meals rich in protein to build them up. One meal a day, and that untempting, will never do it. The catering in many hospitals, the fund's visitors find, still fails to meet the nutritional needs of patients, and this failure is usually the result of an old-fashioned system. The responsibility for catering is often divided between the matron and the steward, the matron being responsible for staff menus, cooking for patients and staff, service to staff and to patients once the food has reached the wards, and kitchen staffing; and the steward for the patients' dietary (using standard menus prepared by a committee), transport of food to the wards, all buying, and stores. The result is that staff meals are planned more carefully than patients' meals, and there is little opportunity for anybody to introduce new dishes into the wards.

The King's Fund have long held that catering should be a hospital department in the hands of a single experienced officer. The chef too should be experienced, and should be paid at rates similar to those he would receive in hotel or restaurant. The advice of dietitians should be available, and the equipment for taking the food to the wards adequate. The fund, who have said all this many times in many different ways, encourage progress by means of a dietetic advisory service. Many London hospitals have appointed catering officers, on whose initiative the Hospital Caterers' Association has been formed with Sir Jack Drummond, F.R.S., as president. Since trained caterers and cooks are scarce the fund is about to found a training centre at St. Pancras Hospital, now part of University College Hospital. It will be built on a bombed site, and is to offer a model of layout and equipment. In time it will turn out cooks and caterers in plenty. This fits in aptly with a new Ministry of Health circular [2] urging better training of hospital cooks. The Ministry recommend two courses

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mings, M., Drummond, M. *Amer. Rev. Tuberc.* 1949, 59, 599.

ty-fifth Annual Report, for 1948. London: H.M. Stationery ice. 1949. Pp. 9. 3*d*.

ty-fourth Annual Report, for 1947; see *Lancet*, 1948, 936.

[1] Obtainable from the secretary, King Edward's Hospital Fund for London, 10, Old Jewry, London, E.C.2. Pp. 85.

[2] National Health Service: Training for Hospital Cooks.

provided by the City and Guilds of London Institute as being "most nearly applicable to hospital work." The King's Fund course will doubtless be planned directly for hospital purposes.

The committees of the fund are in the almost unique position of having more money to spare than usual. State responsibility for the maintenance of hospitals has freed the fund from many financial commitments, and given them the use of their money for other purposes. One new departure is to provide and expand ancillary services to relieve hospitals, such as homes for the aged sick. The experience of their Emergency Bed Service—which last year could not find beds for some 3500 patients, most of them over 60—has impressed the fund with the urgency of this need, and they are helping voluntary bodies to provide homes with nursing facilities for such patients. They are also willing to subsidise bodies who will set up homes linked with hospitals, to which old patients can be transferred when they no longer need active treatment. Even in old age we feel the need of incentives; "to get well enough to go to the home" might, if the home is good, prove a stimulating ambition for bed-ridden grandparents.

Many other undertakings are recorded in the fund's report. Convalescent homes are being helped financially and encouraged to raise their standards; the Nursing Recruitment Service continues to do much rewarding work; the staff college founded to prepare newly appointed ward sisters for their duties is now in full swing; and the fund offer scholarships to nurses to travel abroad, training grants to almoners, and training schemes for administrators and medical records officers. Hospital accounting, now under such keen discussion, has long been among their foremost studies and they are pressing cogently for the adoption of a departmental system of accountancy.

MORTALITY IN EUROPE

THE career of the chief of the health statistics section of W.H.O., Dr. M. Pascua, has given him a breadth of experience of the vital statistical systems of Europe second to none; for that reason his introductory comment on its snares and delusions adds much to his recent report[1] on international comparisons of mortality experience in Europe. Much depends, for example, on the efficiency of death registration; under-reporting of deaths, particularly in infancy, is, or was, common in some countries. National differences in definition may cause appreciable differences in mortality-rates; thus what might have been termed a stillbirth in one country would have been classified as a neonatal death in another, with the net result of an increase in the over-all death-rate in the second instance. Pascua is a little dismayed by the failure of the death-rates given in national publications to tally with those calculated independently from the data about deaths and population given in the same publication. Shifts in population, selective migration, and changes in age-structure following new trends in the birth-rate all tend to distort the picture. Despite his own depressing catalogue of imperfections, Pascua believes that good use can be made of such data, and this, the first of a series of such articles, lends substance to his plea.

The main emphasis of his review is on the relative declines in total mortality which have taken place in many European countries. Generally speaking, there has been a steady fall in the death-rate in all the countries surveyed, and this fall, though checked by the two world wars and the 1918 influenza pandemic, has gone on to allow the recent achievement of record low levels of mortality. Indeed the Netherlands rate of 74 is a historical world record. Of fifteen countr a crude death-rate of more than 15 per thou annum at the beginning of the century, not o death-rate above this level in 1947, only two ye the end of world war II. The rate of fall, of co not been consistent in pattern in all these States steepest in Spain, Italy, and the Netherlands, the Scandinavian countries and Switzerland, so in the British Isles, Belgium, and France. Mo reduction in mortality has taken place in the d infancy and childhood; little, if any, progres made among the killing illnesses of middle and Yet without such advances the present rate of ment in total mortality must slow down, for, around 1900 only 7·5% of the English and Wel lation were aged 60 years and over, by the en this proportion had risen to 15·2%.

All these changes in mortality experience a ably reflected in an increase in the "expectatio (in its actuarial sense of how many years a likely to live if the age-sex specific death-rate at a specific period continue to prevail). In Sp 1910, the "expectation of life" at birth was years. That did not mean that a Spaniard born was likely to live 41 years; the expression is useful way of summarising the mortality expe Spain in 1910. What are termed "generati tables have been constructed by applying to a "cohort," born in, say, 1880, the age-sex speci rates which would have prevailed during thei —e.g., for the first years of the table, the death children aged 1, 2, 3, 4, or 5 years in 1881, 18 &c. From the life table thus obtained for peopl 1880, the "expectation of life" does summ conditions prevailing during their lifetime an nearer to the lay conception of the meaning of t than does the usual form. Some interesting such "generation" life-table construction are for men born in England in 1840, for example, t tation of life on this basis was 39·5 years; for t in 1860 it was 42·8. But for most purposes th tional usage, which summarises mortality at on time, is a more useable index of public healt moment. Progress, or lack of it, can thus be con measured in terms of changes in the expectatio Compared with 1910, the expectation of life in S increased by 9 years to 49·8 years by 1930 similar, if less striking, advances were made by countries. In 1930, considerable differences bet fifteen countries still persisted. The northern la Sweden in particular with an expectation of lif years for men at birth—contrast vividly with I Spain with their expectations of 53·8 and 49 increasing age, however, this disparity decreas at about age 60 the differences are much sm they disappear altogether at 70. It is in infa childhood that the northern countries gain thei tage. With the remarkable consistency which terises these data, the same phenomenon appear the tables of the expectation of life for *females* in life these show a superiority of two years over t of the same nation, but with advancing years parity gradually decreases until it is not much m a year at age 60. Thus again we see how large bution the fall in infant and child deaths has the trends in Europe's crude death-rates since of the century.

Mr. DUNCAN FITZWILLIAMS has been appointed of the Society of Apothecaries in succession E. C. Dodds, F.R.S.

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[1] 1. Evolution of Mortality in Europe during the Twentieth Century. Epidemiological and Vital Statistics Report, 1949, 2, no. 4.

Disabilities

38. TRANSVERSE MYELITIS

than nineteen years have passed since my paralysis. It began on the thirty-third day of nia, from which after being seriously ill I had so as to be looking forward to an early ence at the seaside.

orning, as I lay in bed, I felt an ache in the was troublesome from the onset, got steadily ring the day, and by evening had become a n, surging in waves round my waist. I was pass water. In the evening my buttocks næsthetic, and after this both legs rapidly aralysed, the last movement to disappear being the big toes, which showed a well-marked response. I slept well under the influence of Next morning I awoke to find myself com- aralysed and insensitive below the waist and raise my shoulders from the bed.

ewed the situation, being fully aware of the ce of what had happened, and made up my ce and for all, to accept it without reserve, and no time in useless regret. This serenity of mind ssociated cheerful outlook survived through all les that were to come. It was interrupted only Vhen I was alone on a dreary February evening ater, a sudden consciousness of my utter help- came upon me, and I could have shrieked in steria. I turned my thoughts to something and the mood passed quickly. It recurred for ief moments two days later.

become very thin, so I had been put on a water- days before the onset of paralysis, for con- of nursing. After the onset I decided to live ges, about eight daily, as my sole nutriment. lays I was emaciated, little but skin and bone, ld my surgeon that at this rate I would die in s. He agreed, unless I took nourishment. my wife if she thought it worth while my con- to live if I remained paralysed. She unhesi- said "Yes," so I asked for Benger's Food and not to die of starvation.

* * *

e twelfth day a great event took place: a ished brain surgeon kindly came to see me ultation. He was an admirable consultant— s, full of understanding and kindness, and very -and I shall always revere his memory. Even- e gave me his verdict. "I have now got a e grasp of your case," he said. "It is very rare. not seen more than two like it. The lesion is all, no bigger than a split pea, about the level ninth or tenth dorsal vertebra, a little to the and posterior to your spinal canal. The rest of chief is collateral and recoverable. I have no at is to happen to you. I can only tell you that *absolute* reason why you should not ultimately almost completely, except for a slight weakness right leg." This wonderfully accurate clinical , given when I was still completely paralysed e waist, and expected to die at any moment, ed indelibly imprinted on my mind and was the of my faith and hope during the months that d.

days later I could move my big toes, and move- pread to my other toes, the ankle, knee, and hip, but continuous succession, until three months he onset, I got out of bed and walked in front of mantelpiece holding on by both hands. From the of the first month I had daily massage and ements. My weight had slowly increased.

With the return of movement came spasmod of the of my legs, especially in the evening and durin night. These were very disturbing and somet the violent. They were preceded by an aura, a sting in that region of the buttocks, very variable in site. Thu- threatened to interfere with sleep and I was fortunate er detect the chief exciting cause—hot feet and cool lege I found that if I once got off to sleep I could have a good night, though I seldom slept more than an hour at a time, being awakened by severe jerks. The night nurse would come in and turn me over on my other side, usually after cooling my legs, and I would fall sound asleep before she left the room. I usually was wide awake, sometimes for ten minutes, twelve times a night, but in spite of this enjoyed my night's rest and never had any hypnotics. I feel sure this was a factor in my recovery. After a few weeks the jerks began to diminish, but they persist to some extent to this day. I felt as if I were not lying flat in bed but on a slope, with my feet a foot or two higher than my head. This peculiar sensation lasted three years; slowly the slope became less; and I shall never forget my relief when at last I seemed to be lying flat once more.

* * *

My nurses were unremitting in their kindness and care, and I escaped without the suggestion of a bed-sore. I did not escape a severe urinary infection, with ropy pus. For some weeks I was catheterised, the bladder being rarely allowed to fill above 15 oz. When the use of the catheter was dropped I was found to have an automatic bladder with residual urine. The bladder was then washed out daily for a time, and the residual urine became gradually less; but as the urine did not become sterile either with washing out or medicine, both forms of treatment were soon omitted, and the bladder acted periodically and automatically. My bowels were the cause of much trouble. They were not constipated, spastic, or incontinent, but they did not act on their own: and after an aperient I had little control of them and an enema was unsuitable in the early stages.

A special piece of luck fell to my lot just before I got up, when I happened to read an advertisement of Hilliard's micturition bags.[1] I sent for one at once, found it ideal, and have worn one ever since. They are made of soft rubber and never chafe. They enable a man with an automatic or incontinent bladder to take his place (so far as that disability is concerned) as a normal member of society. The bag is unnoticeable in the ordinary way, but the wearer cannot safely sit on a low chair or the low seat of a motor-car.

My automatic bladder settled down to a maximum content of 4 oz. Three years later, during a single week, the maximum rose to 5 oz. Three years after that, again during a single week, it rose to 6 oz. There it has remained. It empties usually at 3–4 oz., leaving residual urine which can be almost entirely expelled by suprapubic pressure. If it decides to act when I am walking, the first indication is often a loss of power in my legs, slowing down my already slow pace, and indicating that either the lumbar centre cannot carry both loads (walking and micturition) or that there is an antagonism between the two mechanisms. At night the automatic bladder is much more difficult to manage. My method is my own invention. I lie on my side with the genital organs in a small kidney-dish, partly filled with cotton-wool. When I wake, if the bladder has acted, I empty the wet cotton-wool into a receptacle by the bedside and replace it with fresh. My bladder may act during sleep or may wake me. Once I fall asleep I do not change position unless I wake. I am always awakened three to ten times a night, but this has not interfered with my health. The problem of dealing with

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[1] Made by Hilliard & Sons, 123, Douglas Street, Glasgow, C.2.

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jerks the times the They to

isfactorily solved. An enema every
ing to bed, ensures that all is well for
s.

* * *

been several odd features about this
ing as if my legs up to the knees were
ight stockings, which made movements of
difficult and which lasted for several years ;
ce of my de Morgan's spots, which reappeared
ter ; and an almost complete loss of the sense
d cold in both feet up to the ankles (even now
n bed I wish to know if my feet are cold, I have
them with my hands).

e day during my late convalescence I got a nasty
ht. I was standing on a Scottish moor *admiring* the
iew when suddenly I was laid *flat* on the ground as if I had been shot. This was clearly a dangerous thing to happen and I at once tried to find the cause and the remedy. Owing to the immobility, my right leg had given a sudden and violent jerk, and my left leg, caught completely off its guard, had simply collapsed. I have never stood stock-still since, but keep my legs moving imperceptibly. My locomotor troubles and my gait remain the chief and very obvious evidence of my illness. *My walking is never automatic but always reinforced by* a voluntary impulse, and I am always, so to speak, on guard, lest I stumble and fall. I used to pride myself on walking without a stick, but finding that it was a useless effort I have long used a light strong stick with a rubber tip, which enables me to walk more safely, quickly, and steadily. My natural pace is not above $1^{1}/_{2}$ miles an hour. If I try to double the pace, I tire quickly ; and if my legs are cold they soon become very tired. But, with all my care, I often fall. My reaction is quick and I am expert in escaping injury. This necessitates unremitting care. The chief causes of falling are inability to lift my feet high enough, which makes me trip over carpets, rugs, steps, stones, and similar obstacles ; a sudden turn with loss of balance and failure of my slow-reacting muscles to save me ; attempts to support myself when unsteady by grasping unsuitable objects (a hot pipe, a screen, a mobile table) ; and a trick of catching my right toe behind my left heel when walking. A light blow on the knee will stun the leg and cause me to fall at once, and it is highly dangerous to catch my stick in a hole (for instance, in a grating). Getting up after falling is a highly skilled acquired art. During my first year I could not take enough exercise to make me really tired, but I had for years a peculiar localised form of fatigue. This extended from my feet to 3 inches above the knees, equally in both legs, and was so severe that my legs felt only one desire, never to move again. The feeling was periodic, usually arising after slight exertion, and was worse in the morning. I could use my legs as I wished, by voluntary effort, in spite of it. It slowly diminished and is now occasional and seldom severe.

My own psychological reactions interested me. I had heard nervous patients describe a feeling like an electric shock run through them from head to foot—now I was to experience it myself. If I had a sudden fright, the electric shock passed from my waist to my feet. At an early stage in my illness I could trace the course of my large intestine from the cæcum to the sigmoid flexure, as wind passed along it. As I sat in a chair with my legs crossed, my legs were more prone to jerk if I was annoyed. I could walk better if I was happy than if I had been upset. All these effects steadily diminished and passed away.

I returned to work after $10^{1}/_{2}$ months. During all these 19 years I have periodically endured strains that would tax an average man—long operation days and heavy lists, driving a car long distances in a single day, playing two rounds of golf, and so on.

At every stage and in every way helping
been held out to me, but these, I have le
never be allowed to prevent independent effor
the moment when I first walked in public, with
in one hand and my nurse supporting the other
beheld pitying almost tearful eyes watching
movement, I have had to resist the debilitating
of human sympathy. One gets adapted to
abilities, and learns to accept with good humo
sense of grievance the troublesome mishaps.
forgot my singular good fortune—that I am
above the waist and that since my sense of
intact I can walk and live a normal life.

Special Articles

MEDICAL LIBRARIES IN HOSPIT

BY A COMMITTEE OF THE MEDICAL SECTION
LIBRARY ASSOCIATION

THE reorganisation and re-grouping of hosp
taking place as a result of the National Heal
Act opens the way to a better-organised libra
Hospital authorities are being encouraged t
for all kinds of readers—doctors, nurses,
auxiliaries, and patients—and it is already app
they are faced with many problems. The nee
and guidance is urgent.

Medical librarianship is a highly specialise
and the present great expansion of library
likely to lead to a serious shortage of trained
This shortage should only be temporary. Th
Association has recently instituted a special
tion in medical librarianship, and, as opport
acquiring the necessary knowledge and experienc
the staff difficulty should not be so acute. For
the organisation and control of many libr
probably be entrusted to members of the ad
staffs or to part-time workers who are unlik
conversant with scientific literature and wi
methods.

The purpose of these hints is to help those
the immediate task of organising and running
library. No attention will be paid to the q
patients' libraries, since it is generally agreed
are best administered by the public libraries in
tion with the voluntary agencies that have g
good service in the past. Library provision for
medical auxiliaries presents special problems
engaging the attention of the professional org
more directly concerned, and will not the
considered here.

Regional hospital boards which are thi
establishing libraries for professional staff shoul
what library services there are already in t
Medical library provision throughout the count
uneven. London is better provided than any
in the world, and there are excellent medica
in the great provincial centres. Outside the la
the existing library services are incomplete
inaccessible. The specialist and the resear
usually have access to the large medical librari
the British Medical Association, the Royal S
Medicine, or the Medical Research Council, and
the National Central Library to the genera
resources of the country. University medic
libraries provide excellent services in each reg
use of these services should be encouraged and d

THE SMALL PROFESSIONAL LIBRARY

The need in individual hospitals is for a sma
for quick reference by the staff. The specia
interest of each hospital must be considered in

stock of the library and in maintaining a suit- : of current books: and the advice of a small e of the specialist staff should be regularly The care and maintenance of the library will as much attention as building up the initial Iost medical textbooks go out of date within rs and are superseded by new editions. Expendi- urrent books is therefore a recurring charge, and cogent reason for great care in book selection. the library within manageable limits and it as a live working unit, superannuated books discarded from time to time.

should be grouped according to subjects, so lers can readily consult them. All difficulties destroy interest in the library. Part-time ıssistance is essential, to keep proper library

An alphabetical card-index of the books must , to serve as a catalogue and as a record of s. Some books—dictionaries, directories, and —should be clearly marked: *For reference only; removed.* All other books should be available owing. A duplicate record of loans should be pt alphabetically in the names of both the books borrowers. Simple rules should be made covering od of loan allowed and showing to whom the of borrowing is extended. Several hospital and society libraries at present extend the privilege ctors in their district. The needs of auxiliary st also be considered.

JOURNALS

licals, which are an essential need of the scientific present special problems of selection, subscription, age. It will not be possible, and it is not neces- r hospitals to attempt to build up large stocks ical journals. Some 2000 medical periodicals lished each year and only the largest libraries rd to acquire and keep anything approaching e stocks. The publication of union-lists of als, the extension of schemes for coöperation and rary lending, and the ever-growing use of , 'Photostats,' and microfilms have done much e periodical literature more accessible. It is, r, very important to be able to refer at once to when any point of treatment or diagnosis is in and if the hospital library can apply part of its to the purchase of current journals this should e. An expenditure of £50–£100 a year would a valuable nucleus, but periodicals take up a eal of space and it costs money to have them

Just as he likes to choose his books the specialist nt to choose his journals, and he will probably be to some of the more important. Members of dical staff should be encouraged to present to ary the journals they no longer require for personal Precise records must be kept of the incoming cals, to ensure that volumes are complete. Care- ction should be made before binding for permanent . Volumes not required permanently in the hospital efully be transferred to a larger central library.

A GUIDING BOOK-LIST

lected list of books in English which are in steady d, giving alternative titles under each subject- g, has been compiled by this committee with vice of leading authorities in the various depart- of medicine. Encyclopædic works and highly lised monographs have been deliberately excluded his list, as it is assumed that they will be obtain- n the large central libraries. Copies of this book- d further advice on medical libraries may be had the honorary secretary, Medical Section of the y Association, Wellcome Historical Medical Library, uston Road, London, N.W.1.

In Eng

A Running Commentary by

At first sight they didn't lo Indeed only half of them were *Kurhaus*, half hotel, half hospital doctor, nurse, masseuse, and techı hint that illness lay inside its walls. fectant, white walls, iron bedsteads. graced this establishment. Instead, ordinary pleasantly furnished ones, t enticed both sun and patients, and the g them in charm. Cardiacs, rheumatics, gastrics, and neurotics nudged elbows wı makers in the dining-rooms and lounges. Th was that of silence between 2 and 3.30 P.M. 10 P.M., resented neither by holiday-maker nor The usual hospital discipline was replaced by a cc tive freedom. Under the doctor's and nurses' unobt supervision patients took their own temperat measured their own fluid outputs, kept their medic in their rooms and took them as prescribed, order their own lives, and helped with their own treatment. Bed-ridden patients were few; the word "chronic" had no place in the *Kurhaus* vocabulary. Temperature and fluid charts were kept only where strictly necessary. Patients were encouraged and expected to live as normal lives as possible. All had that kind of disability where the patient can learn to live in a normal society within the limitations imposed on him by his body and mind. Here, where so little stress was laid on illness and so much on the hope of recovery and the knowledge that disability was not synonymous with an unhappy or useless life, patients learned very quickly to find their feet among normal people again—an art which some had previously neglected through lack of a healthy atmosphere in which to practise. It was a long-term job; some clung to their ailments, but most responded well and the results were so worth while that one came away wishing there were more of such places in our own country.

also during the whole of the
ts. They are in the end the
-eration being done. That
ell. deplored the diminu-
being one of the danger
bear out his grave
T. B. LAYTON.
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My watch being wrong the other morning, I arrived at the station a few minutes early for my Victoria train. A London Bridge train came in first and I watched idly as the crowd threw themselves into the carriages. Suddenly I found myself counting heads. Of as big a sample as could be noted in the short time, about one passenger in three was out of breath. At this station the train times are a little erratic and it might have been that a few moments earlier arrival caused the sudden rush. But the Victoria one rolled in a minute late, and again there was an estimated third of the travellers visibly breathless—and the station approach climbs only the slightest of hills. My curiosity was roused sufficiently to repeat the observation next day, with almost the same result.

It is a fair guess that these speed merchants are sowing the seeds of a fine crop of coronary thrombosis, myocardial degeneration, and for that matter peptic ulcer. Most of the entrants in the morning race are regulars, and they probably start most days by bolting an inadequate breakfast. Then in the train, as soon as they get their breath back, or before, they light cigarettes or pipe. Since most of them are at least approaching middle age, they are asking for trouble.

"To what end," I asked myself, "is this desperate daily dash?" If punctuality at the office is so important, then surely punctuality at the station is as important, and therefore worth a couple of minutes' margin to catch the train with certitude and comfort. There is no sporting spirit about it, as their grim faces show. (Admittedly their expressions may only be evidence that they have scanned the daily paper; the only item which I do not find depressing is the crossword.) I pondered the problem—and was suddenly brought up short. My pulse was pounding; it was 95 per minute. Today I too had run that last bit. Being early yesterday had only been a fluke due, as noted above, to my watch being fast. The day before I had missed my second cup of tea, and the day before that I had almost lost the train. The finger I had been pointing at my fellows turned inexorably rks

and Now

Peripatetic Correspondents

ok like patients at all.
for this was a Swiss
The white coats of
ician gave the only
No smell of disin-
or tidy bed-tables
the rooms were
sun-balconies
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bronchitics,
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'Sall right,

ndiose G.P.I. but he had a
n. He told me that he had just
y, so I asked him how many people
Well, I'm not sure exactly," he said. "but
wenty-four men twenty-four days to mix the
ard for the sandwiches."

* * *

One thing about the Board of Control, they don't lose heart. In their latest report they remark: "In their Report of 1846 to the Lord Chancellor the Commissioners in Lunacy wrote . . ." (then follows criticism of admission documents) ". . . The situation is still unsatisfactory." I have always thought of the Master in Lunacy as an awe-inspiring person, but in future I shall see him heaving a long-suffering sigh as the centuries roll by.

* * *

We made him a gift of ourselves en bloc.
We gave him the hospitals, stock and Lock.
And under the Criminal Justice Act
We gave him Broadmoor, with staff intact—
Warders, boarders, bats, and trusties—
As a simple act of criminal justice.

* * *

". . . and the psychiatrist's report said she had righteous cramp."

* * *

SIR,—I hesitate to criticise so distinguished a colleague as Dr. Pardoy (Aug. 27, p. 398) but, putting personal feelings aside, I must let him have it straight, ex humero summo.

Before launching my main grouse, however, I would mention his inconsistency. He admits, apparently, that the disease was first reported by Thomas Pearce (himself, surely, a lover of "fair" play), professor of veterinary surgery at Widdecombe University, yet he refers to it as *his* disease. One has no wish to argue here as to who owns the copyright. This can, and unless Dr. P. is prepared to climb down, will, be done at the proper time and in the proper place.

No-one could find fault with his article on literary grounds: it is admirably lucid, very informative, written in simple, almost basic, English, and an exhibition of the results of many years of clear thinking and deep learning. The qualities displayed are the more dangerous, however, because from a scientific point of view the doctor's effusion is sheer balderdash. As everyone should know, Pearce's "3 cases" was a description of three phases in the same disease of one subject—namely, a mare. This unfortunate beast (suffering from some form of hereditary cyanosis) was in bad shape when handed over to me and my six colleagues and could by no stretch of imagination be described as a young adult. The ætiology of the disease in this, the only known example of it, was diagnosed during life as traumatic lordosis. Permission for P.M. was refused, but later interment (which almost spontaneously occurred) was carried out and confirmed the presence of ossa crepantia or "mobile skeleton."

Finally, please note that my paper of this year should be cited under the authorship not of Cobley et al. but of Cobbleigh et omn., and that my name is spelled:

THOMAS COBBLEIGH, M.WID.C.V.S.

Letters to the Editor

POLIOMYELITIS FOLLOWING TO

SIR,—The death of two children from
poliomyelitis after tonsillectomy raises
great importance in clinical medicine. For
I taught it as the "principle of the domir
It may be enunciated thus: "when a pati
from two diseases, both of some sever
treatment for one of them interfere with
in the other; and if so which is the
'dominating'? When this problem is b
the treatment of the other is the one th
the patient owing to the presence of the do
should that treatment be forgone, or sh
that the presence of the dominating lesi
taken?"

I learnt this in the early twenties fro
cularly fierce Guy's man, Dr. E. W. C
North-Western Fever Hospital, in relation
in a case of diphtheria. It was the first ti
nosed this, and I said to the A.M.O. in char
"Well, we had better get on with the job
to get the theatre ready." "No," sa
Blackwell, now physician at the Western
must go and talk to the medical superin
"I do not see why that is necessary," saic
know about that," she said, "but here
So we went. "What about that case?" sa
"She has a mastoid," said I. "What do
he asked. "Oh! we've got to operate," s
a pace forward, thrust his face into mine
advanced like the 100% he-man of the p
day, and almost growled at me: "Mr. L
guarantee that that patient will die i
operate?" "No, Sir, certainly not," I
said he, "I will not allow you to do so." E
the kindly urbane teacher that he usually
on: "In every case of diphtheria, eve
severity, I am quite certain that there m
damage to the heart-muscle that no ana
be given unless otherwise death is certain.

In the subsequent 20 years that I remai
service I never operated on a mastoid, exc
either in his or any other hospital to which
in a patient suffering from diphtheria, and
rule to septic scarlet fever and measles in m
The exception was a woman of about 35 wit
paralysis and her bed propped high, on wh
with Dr. Goodall's consent, under loc
Again I had the assistance of Dr. Ursula

Septic scarlet fever has, for a time,
Diphtheria is controlled by the State; an
can modify measles into harmlessness;
principle remains and is capable of mo
extension. It was a few years later that I
following form. If an operation is advise
who, during the period of convalescence,
to communicable disease which may impai
of the operation, is this so imperative that
be taken or should it be deferred until
catching the communicable disease has pa

The operation was tonsillectomy, and
cable disease measles. It was a year in wh
a big epidemic, and we had eight cases of
had developed after tonsillectomy and sub
mastoiditis. We lost four of them. This se
me that of all forms of inflammation of t
cleft the tonsillectomy-measles-mastoiditi
the worst. After that year I never took out
a measles epidemic from a child that ha
had measles.

who work only in hospitals where communicable
e not admitted are not faced with this principle
ninating lesion. In the 35 years that I was on
of Guy's I never had to deal with it in that
but now the same problem that I had with
as arisen with poliomyelitis and tonsillectomy.
eard of this a year ago—some may say longer—
ada and it was discussed at two of the sections
.A. annual meeting in 1948. In the section of
ogy Dr. Banks made an appeal to all those who
on tonsils to desist when poliomyelitis was
in epidemic form. At the section of diseases
roat and ear, however, two leaders in our
were unable to accept this guidance. One
the operation of tonsillectomy as being so
that he would not defer it, and the other
that not everyone in Canada believed that there
linical association between the two.

e have had it brought to our very door. What
do about it ? The ideal is that everyone who
tonsils should use his own clinical judgment
st from all operations in any year in which
litis is prevalent until it is no longer so, even if
ns putting off all tonsillectomies from the early
until the end of February. It is not a question
te scientific proof ; but one of probability. But
one of death and mutilation. There is no
everyone to become convinced by personal
e.

rgument that tonsillectomy will not allow of
ll not hold water. My predecessor at Guy's,
. Steward, used to shut down all operations at
nts from October to March—a practice in which
d him and extended to all such operations about
ago, since when I did no operations on tonsils
he winter months. No-one came to any harm
And those who claim that a tonsil operation
done at once have long been confuted by the
lists which they have allowed to pile up all over
try. If they really believed that these operations
gent they would have clamoured years ago for
ssary accommodation.

e administrators help us ? Not by ordering. In
e reports in the press it seemed to be suggested
e excellent memorandum circulated by the
of Health last year was an *order* to desist. This,
ot, was faulty journalism : but it continued by
a pathologist on the postponement of the
on. If he was accurately reported this pathologist
o have gone beyond his subject. There is no
gical evidence whatever that tonsillectomy leads
ion of the body by way of the wound produced.
dence is clinical entirely ; and it is for us clinicians
le. We are less likely to persuade those who do
ognise the principle of the dominating lesion if
ople start to dictate. It is, however, the business
linicians. For every clinician today sometimes
across a case in which tonsillectomy may need
ration.

e is a way in which the administrators may use
fluence. Under no circumstances must they be
to put pressure on clinicians to perform operations
their better judgment. This must be opposed
er it arises. But they may be entitled to call a
here the opinion of the majority of the profession
st operations being done, as I think must be the
re ; and they can do it by withholding beds.
here a loophole should be left for the clinician
e exceptional case. And that ought to be met
insistence on a second opinion, not from another
or on tonsils but from a physician of his own
g. Some such administration as this might well
up not only to stop tonsillectomy in times when
poliomyelitis is rife but also during the whole of the winter all over the country.

Finally there are the parents. They are in the end the persons responsible for the operation being done. That very wise little old man, Lord Snell, deplored the diminution of parental responsibility as being one of the danger signals of today. These cases bear out his grave warning.

At sea. T. B. LAYTON.

THE DOCTOR'S PROFESSION

SIR,—May I express my admiration for this series of essays ? In my opinion they state very clearly the views of the minority who occupy the Christian position. Although they are unlikely either to edify or to win the approval of readers who divorce religion or the fear of God from living, they nevertheless deserve a place in THE LANCET, which claims to be a journal of medicine. Medicine untinctured by either politics or religion is a specialty which deserves a journal of its own.

Hill End Hospital, St. Albans. F. C. STALLYBRASS.

SIR,—Modern medicine owes much to Christian thinking and more to the Christian men and women who have been, and are, leaders in the profession. It was therefore surprising to see that two correspondents were protesting about the series of articles under the above title. In this generation of advancing materialism, with its many ugly forebodings, it is surely high time that we were considering again our work as doctors in the light of our historic national faith. This is reason enough to welcome the articles. We have no business to allow others to do our thinking for us.

Dr. Simmons (Aug. 20) appears to me to misrepresent the writer of the second article, who is singularly careful not to overstate his case.

1. The Christian doctor does not enter the world with a "hopeless attitude." The reverse is the truth. He is aware of man's corruption but is far more aware of God's power and plan to overcome that corruption.

2. If a doctor is concerned *merely* to relieve pain "his attitude is sentimental and, because it is sentimental, dangerous." No-one would suggest that it is a Christian's duty to withhold relief for physical pain and suffering, but, like the Master whom he feebly follows, he does desire first and foremost to preserve the divine gift of life.

3. I do not agree with all the article says about suffering but the writer does not fail to condemn those who refuse to use "all reasonable means" for its alleviation. The mystery of suffering is a very deep one ; it cannot be fully explained in terms of pain and disease on a physical level. Yet the Christian believes that he can see a little further into its meaning than the materialist.

4. The answer to Dr. Simmons's question is—Yes, we are an unhealthy society if we pay too much attention to the needs of the body and in so doing neglect the soul of man and the demands of God upon him.

Iver, Bucks. C. G. SCORER.

SIR,—I have read with great pleasure the admirable and timely essays in this series. As it is wellnigh impossible for those uninstructed in Christian ethic to appreciate them, I should like to suggest a few thoughts to your two correspondents who registered some classic arguments in disapproval.

Mr. Whittingdale (Aug. 20) prefers you to serve your readers with medicine "untinctured by politics or religion." It is not impossible to dissociate medicine from politics because political principles rarely interfere with the theory and practice of medicine. On the other hand, religious principles (particularly in relation to questions arising from sterilisation, abortion, birth prevention, and euthanasia) are challenged at every turn. Defiance of these principles prompted the Nazis to liquidate their disabled and perpetrate unmentionable atrocities for the sake of their own monstrous eugenics. Hence it is a good thing for your journal to bring to the careful consideration of its thoughtful readers the very necessary interconnexion between these two great branches of knowledge.

Dr. Simmons objects that there is a hopelessness about the attitude or belief which claims that man is cut off from God in toto and is therefore corrupted by disease and mortality. Man is not entirely cut off from God. If this were so, the situation would indeed be black. The Christian believes death and disease to be the logical outcome of man's original rebellion against God. Christ effected a reconciliation. But the consequences of a crime may continue long after the criminal has been forgiven. It would take a long essay to present the closely reasoned arguments for this belief in the fall of man and its dread consequences. Suffice it to say, man certainly *looks* fallen. Even now within his own nature there exists a conflict between duty and desire which is the result of his old sad rebellion. This is the common experience of us all and a cause, I believe, of many neuroses.

Dr. Simmons asks whether he must allow "pain and suffering to persist to the end that life may be prolonged." No, indeed. In the first place pain is not allowed in order that life may be preserved. Life is preserved and consequently pain is endured. The Christian doctor is bound in charity to alleviate severe suffering as much as he is able. He can never appropriate to himself the right to extinguish his patient's life.

Your correspondent suggests that the Christian doctor "must not go to all lengths to alleviate suffering by the method of modern medicine." If by this he means that the Christian doctor is not entitled to employ a lethal dose of sedative to vanquish pain, he is right. He blesses the nerve block in cases of inoperable cancer. So do we all.

Finally Dr. Simmons asks whether the writer of the essays regards the National Health Service, providing indiscriminate care for all, rich and poor alike, as the outward expression of an unhealthy society. This is a very sad interpretation of the writer's meaning. There appears to be no contradiction in the existence of the National Health Service and the principle "Love thy neighbour as thyself." There is certainly nothing unhealthy about the principle of mutual love and its application to the present health scheme—or any other scheme that attempts to serve society and promote its welfare.

In conclusion, may I emphasise the importance of constant vigilance lest the great religious principles which govern our lives should be allowed to fade out of the field of medical science? If they are ignored, we shall have an undisciplined science open to mortal abuse.

Lancaster. F. S. RICKARDS.

SIR,—As a LANCET subscriber I confess to sharing the irritation felt by Mr. Whittingdale (Aug. 20) on account of your articles under this heading (though for a different reason). I would like emphatically to protest against his view that Christian values have nothing to do with medicine, for this is what I take him to mean.

I believe that sickness of men's souls brings them to the doctor as *often* as—if not more often than—sickness of their bodies, when they, having no idea of the fundamental cause of their symptoms, turn to the doctor rather than to the minister of religion; and that in these circumstances the patient is fortunate whose doctor is competent to diagnose soul-sic[illegible] d co[illegible] eous enough to be frank about it.

I should like to ask Mr. Whittingdale what would give to a patient who yearns to give or tobacco, yet has no will-power to do so; out that Dr. J. A. Hadfield, in his *Psychology* (p. 96), states that religious conversions have (instantaneously) the same effects as succe therapy (which may well be prolonged). It pointed me to Begbie's book *Broken Ea* actual examples of the *changes for* conversion can work in men and women.

The doctor who is not a Christian—that is, constantly careful about beams in his own e competent to perceive spiritual causes of s others. I think therefore that space in a journal might properly be devoted to showing as can be shown, that Christian belief is not less than the dispassionate investigation, m of the thought, words, and deeds of daily teaching which claims to be Truth. The would follow might well be immense.

Winfrith, Dorset. P. R. B

SIR,—I wish to thank you for the excellent essays in this series. As a Christian trying, ferently, to apply my religion to daily work a practitioner, I find it invaluable to have the so clearly discussed.

I disagree with Mr. Whittingdale (Aug assumes that these articles are "outmoded" you of "senile decay." I, for one, continue t to your journal *because* you continue to publ with a wider viewpoint such as these and the Disabilities series.

Farnborough, Hants. J. P

SIR,—It is unfortunate that your co Mr. Whittingdale (Aug. 20), should have sin *Church Times* as an example of the kind of which specialises in "outmoded evangelical Christian ethics." Those who happen to of that worthy journal will be surprised and hear the word "evangelical" used in this Incidentally, the journal in question has distinguished for its interest in ethics, otherwise.

The series of articles on the Doctor's Profes it should be understood, is the work, not or ecclesiastics, but of members of our prof strike many as neither "evangelical" nor "o but plain common sense. My impression American parlance, "there ain't no flies" on have written them. This is not the work obscurantists. It is because so many have do look, for that anomaly, a "Medicine unti either politics or religion" that some at least impelled to set forth this holistic conception practice.

I admire their courage, and hope that they reveal their identity.

Leamington Spa. F. S.

SIR,—Congratulations on the second article heading. It was inevitable that a condensed of Christian ethic and its relation t the medicine should be misunderstood by hose w already know its main tenets. Wit rega expression "fallen world" that Dr. Simmons much, let him realise that the facts ar that suffer more or less during their lives, an that die. The Christian doctrine of "the fall" is a tion of why this happens.

The questions of the purpose of suffer of man's existence, the presence or absence of death—all these have haunted men thr On the answer a man gives to these quest es my behaviour here have any effect on my death? depends a man's practice of life and tails of a man's practice of medicine. That Whittingdale's implicit insistence that medifluenced by religion, or unconnected with it, ous.

no was God) did not suggest we employ go-slow medicine. It is merely that the first aim of to safeguard the gift of life: its secondary elieve suffering. Consider surgical operations. increase suffering temporarily for the purpose ife.

cn Tyne. P. S. TWEEDY.

a professing Christian and as a doctor long of the significance of social, personal, spiritual, is states to medical ætiology and therapeutics, elf in general agreement with Dr. Simmons ism of one important paragraph in the second his series. I refer to the paragraph headed Doctrine" on p. 293 (Aug. 13). The two views nature (and hence of the origin and nature uffering, and sickness) there described are, ssert, only two of several alternative Christian my mind, the ideas implicit in the doctrines depravity" and of the existence of an stinction between the natural and the superre not only intellectually incoherent but ub-Christian.

H. E. COLLIER.

ome of your correspondents seem to find the Christian ethics difficult to swallow and would see them omitted from your columns. In my LANCET is to be congratulated for putting readers an Anglican statement of Christian ich, though not acceptable by all, should in r concepts be a wholesome guide to doctors the name and a positive antidote to scepticism, ism, and nihilism. I believe that those "prointellectuals who, in these feverish and strongly ve times, have broken with, or have never opportunity or the patience to embrace, the f our traditional beliefs and practices, including s, show unmistakable evidence of immaturity of it, mind, personality, or what you will.

S.W.17. A. WYNN WILLIAMS.

My inclination to congratulate you on the earlier this series was strengthened by reading the om Dr. Simmons and Mr. Whittingdale, who seem derstand the authors' argument, which was least designed to set the "problem of pain" oper perspective. The subject has been well a book of that title by C. S. Lewis; and more Martin d'Arcy in *The Pain of this World and the e of God*. It is a problem to which the Christian hough to many unacceptable, is relatively simple. hristian answer, however, may well seem nonthe man who does not accept fundamental beliefs; to such a one an uncomfortable ethic is "outmoded," as though absolute truth troyed by the lie of the moment, or as though epended for its existence on acceptance in a tic age by a majority. The fact is that God made d made them for definite ends. This is the basis atural moral law. It is a fact which cannot be by a sneer, nor altered by its unacceptability or to many. It is a fact which should not be to the relative obscurity of a church paper read few, since it is a vital part of the ethical ind of us all.

HILARY.

TUBERCULOSIS IN CHILDHOOD

SIR,—In his article of Aug. 13 Dr. Miller cites unequivocal evidence that tuberculosis is of importance to the pædiatrician. However, this hardly justifies his assertion, as a pædiatrician, "that the tuberculosis service as a whole gives insufficient attention to childhood infection and the toll which tuberculosis exacts from the children of this country." Pointing out that the mortality from tuberculosis under the age of 15 years accounts for only 10% of all tuberculosis mortality, he suggests that this "may explain the view current in the tuberculosis service that the problem presented by childhood tuberculosis is relatively small."

Tuberculosis physicians have greater justification than this for not paying any greater attention than they do (which is not negligible) to this disease in childhood. Every pædiatrician will presumably agree that the good health and survival of the parents are an important factor in the healthy upbringing of children. More widely, the health of a community is related to its economic stability, and both depend inherently on the health and working capacity of young adults. Stocks[1] has shown that in 1945 the number of expected working years lost because of deaths from tuberculosis was 565,300, in comparison with 354,600 for cancer, and 268,200 for fatal accidents. Tuberculosis damages the productive capacity of this country more than any other single disease, almost equalling in its ravages the loss of expected working life caused by cancer and fatal accidents together. The tuberculosis physician, realising this, and having a wider perspective on the disease generally than the pædiatrician, is justifiably apt to direct more attention toward young adulthood—the bread-winners of the nation and the family.

During the last fifty years in this country, by far the steepest decline in mortality has been among children. The mortality-rates quoted (from Hart and Wright[2]) in table I show that the decline among young adults, especially females, affords least ground for satisfaction.

TABLE I—MORTALITY IN ENGLAND AND WALES FROM RESPIRATORY TUBERCULOSIS PER 100,000 LIVING, BY AGE AND SEX DURING 1891–1936

Years	Age (years) and sex													
	0–4		5–14		15–24		25–34		35–44		45–54		55–64	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1891–1900	44	39	20	37	141	144	237	192	310	122	314	164	262	124
1901–10 ..	35	30	15	29	112	111	197	148	245	155	275	131	238	105
1934 ..	8	6	5	8	72	99	94	91	107	60	139	47	115	36
1935 ..	6	7	4	8	64	93	90	85	106	57	126	42	117	37
1936 ..	7	7	3	7	59	88	84	78	98	53	128	41	120	36

Dr. Miller observes that in 1945 the tuberculosis mortality-rate in the age-group 0–15 years was 25·2 per 100,000 living. However, for the same year the corresponding mortality-rate (civilian plus non-civilian deaths related to the estimated total mid-year population) among young adults was as follows:

Age (years)	*Mortality-rate per 100,000* Males	*Mortality-rate per 100,000* Females
20–24	67 ..	96
25–29	70 ..	83

In other words, although tuberculosis killed 25 out of every 100,000 children, it was more than three times as deadly among the "young parents" of the population.

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1. Stocks, P. *Tubercle*, 1949, 30, 50.
2. Hart, P. d'A., Wright, G. P. Tuberculosis and Social Conditions in England. London, 1939.

To assess the devastation caused by tuberculosis more completely, one must compare the number of deaths it causes with the number of deaths due to other diseases in various age-groups. Miller has done this for children, and table II (derived from the *Registrar-General's Statistical Review for 1946*) shows the number of deaths from certain common causes in selected adult sex-age groups (civilian plus non-civilian excluding operations of war). These are arbitrarily selected to represent what might be called "young parenthood," "middle age," and "retiring age"—i.e., 20–25, 40–45, 60–65. The six causes listed in table II account for 75% of the deaths in the age-groups that have been selected. Obviously, by causing one-third of the male deaths and half the female deaths in the 20–24 age-group, tuberculosis is the disease most damaging to the productive capacity of the community; and thus the attention of the tuberculosis physician is rightly focused on this age-group, who are also the patients most likely to benefit from modern treatment.

TABLE II—DEATHS IN 1946 AMONG SELECTED AGE-GROUPS FROM SIX COMMON CAUSES, EXCLUDING DEATHS DUE TO OPERATIONS OF WAR. THE PERCENTAGE OF DEATHS WITHIN THE SEX-AGE GROUP DUE TO EACH CAUSE IS SHOWN *IN PARENTHESES*

Cause of death	Age (years) and sex					
	20–24		40–44		60–64	
	M	F	M	F	M	F
Tuberculosis ..	905 *(34%)*	1542 *(55%)*	1256 *(18%)*	618 *(12%)*	1111 *(4%)*	336 *(2%)*
Cancer ..	120 *(4·5%)*	67 *(2·4%)*	1156 *(17%)*	1508 *(29%)*	5396 *(21%)*	5109 *(27%)*
Cerebral hæmorrhage	11 *(0·4%)*	11 *(0·4%)*	160 *(2·3%)*	218 *(4·2%)*	1686 *(6·5%)*	2119 *(11%)*
Heart diseases	165 *(6·3%)*	197 *(7%)*	1004 *(15%)*	741 *(14%)*	7074 *(27%)*	4754 *(25%)*
Respiratory diseases	132 *(5%)*	143 *(5%)*	705 *(10%)*	393 *(7·5%)*	3949 *(15%)*	1609 *(8·4%)*
Violence ..	677 *(26%)*	138 *(5%)*	815 *(12%)*	277 *(5·3%)*	930 *(3·6%)*	435 *(2·3%)*
All causes ..	2615	2832	6799	5271	25,740	19,120

What is the relation between primary infection and the development of significant illness from tubercle bacilli? The prognosis of primary infections generally, at all ages except infancy, is apparently good—most people undergo Mantoux conversion uneventfully. This is in sharp contrast with phthisis, which kills more than half its victims within three years.[3] Wallgren[4] believes that the symptoms of primary infection occur six weeks or so after actual infection, and there follows a three-month period during which the malignant generalised forms of the disease may supervene. Then comes the pleurisy period, from about three months to seven months after the manifestation of primary infection. After this phase there remains the risk of skeletal tuberculosis—a *hazard which continues* roughly three years after infection until the primary complex has healed. In those persons with primary infection in adolescence this stage corresponds to the period of post-primary pulmonary tuberculosis. Wallgren finds that most cases of phthisis occur during the first three years after the manifestation of the primary infection, but that cases *also develop later* with rapidly decreasing frequency.

This view of the relation between primary tuberculosis and phthisis is very important, and other evidence that phthisis follows in the wake of the primary infection is to be found in the ever-growing literatu There seems to be less and less need "reinfection," and "superinfection" in t of phthisis.

Gaisford[5] has advocated tuberculin-te ren as the prime measure for solving th primary tuberculosis in childhood. Ext culin testing is certainly most necessary, problem is post-primary disease in adults

Tuberculosis physicians will readily ag Miller that the only method of controllin in childhood is to prevent infection—hen occupation with controlling the infective a theless, their preoccupation with adults do exclude their concern with children, alth slightly different aspect. General practi refer children with *the vague symptoms* d infection to the children's department rat tuberculosis physician. However, the tube is constantly searching for uninfected child contacts of known cases, and so he discover number of recent primary infections w probably keep under surveillance for two o or perhaps longer, after puberty. At pre approximately 130 such children under s this clinic. Twice since the advent of *the discovery of the primary infection* b helped a general practitioner in this tow tuberculous meningitis early and so bring result from chemotherapy.

The tuberculosis officer is concerned wi negative children from the preventive as tunately, lack of B.C.G. hampers our efficie with this group. In Reading there are a contact children under surveillance, but mere handful of these come from the sputum-positive cases; such children are us before they are discovered. These children a tested at regular intervals, and besides "timing" of primary infection such tests a ment of the sputum-negative patient in t

A third group of children are referred t this town from the infant-welfare centre, w of children under 5 years are undergoing culin tests. All the tuberculin-positive passed on to the tuberculosis service; *need be done about the primary* infec endeavour to find the infective source.

I do not think that pædiatricians and physicians differ in their concern for ch extent that Dr. Miller fears. The pædiatri with sick children, and to him tuberculosis large in differential diagnosis. The tuber seeks, by epidemiological methods, to preven in children. We have not yet attained th when we can reproach ourselves for the oc primary infection; the tubercle bacillus fin before middle age.

Reading. W. H. T

MERCAPTAN IN THE BREA

SIR,—The article of July 30 by Profess was of particular interest to me.

In July, 1948, a nurse in the Simps Maternity Pavilion remarked on the offensi baby who had just received a simple tr hæmolytic disease of the newborn without was evident that the source of the smell w breath, which could be described most a "like garlic." The odour persisted for a *four hours after transfusion.* Attention several further cases of hæmolytic anæmia, a

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3. Thompson, B. C. *Tubercle*, 1942, 23, 139.
4. Wallgren, A. *Ibid*, 1948, 29, 246.
5. Gaisford, W. F. *Brit. med. J.* 1946, i,

was normal before transfusion. garlic could
letected in it within a few hours of the blood

nown that Professor Davidson was interested
iliar odour of the breath in cases of severe
ge and that he was of the opinion that mer-
ght be responsible. The possibility of more
determining the substance was discussed, but
evident that such an investigation would be
ilt.

n we have detected "garlic" in the breath of
h icterus gravis neonatorum following trans-
was of especial interest to note it strongly
cases without jaundice. which did not, pre-
have such severe hepatic disturbance. The
s pursued no further. however, and the odour
reath of patients treated by replacement
n was not noted.

s that mercaptan—if this indeed is the cause
nsive odour—may appear in the breath of the
when the signs of liver damage are much less
in the adult: but it is difficult to see why it
pear after—and not before—transfusion with
e blood. Has this been observed by others in
disease of the newborn. or in babies without
tion who have been transfused in the neonatal

nt of Child Life and Health, J. W. FARQUHAR.
iversity of Edinburgh.

N-SUTURE TECHNIQUE IN INFECTIONS OF THE HAND

n their article of July 30, Mr. Arden and his
s describe a technique, based on previous work
on and others,[1] of incising the affected part.
out pus, and making a careful search for any
If present, the sloughs are excised completely:
an essential step in this method."

is no doubt that excision of sloughs is an essential
e healing of infections which have been present
ugh to produce necrosis of tissue, and in such
ances the advice given is sound. But Mr. Arden
colleagues do not make sufficiently clear at
age in the progress of a hand infection they
ne careful search for sloughs. In my experience
y difficult to judge how much tissue is an actual
nd how much tissue is going to recover, when
g an acute infection of the hand even with the
tourniquet's bloodless field. In my experience
e majority of hand infections are seen by the
before a slough has formed. I feel that if the
ne of excision-suture in infections of the hand is
up enthusiastically and indiscriminately—as is
happen with a new method—grave results may
especially since hand infections are often treated
e-surgeons of short experience.

erious complications followed in the 100 cases
d by Mr. Arden and his colleagues: but they had
ases on chemotherapy, with the infected hand
lised—factors which they themselves admit
ably reduced the incidence of serious complica-
Exploration of infected hands for sloughs, unless
iously performed, must inevitably break down
ive barriers and tend to spread infection. Anyone
practised surgery before the days of chemo-
y remembers the tragic case (sometimes in a
ue) where injudicious incision of a finger resulted
strous lymphangitis or even septicæmia. Attempt-
hunt for sloughs in a finger which is really the
of lymphangitis. and not a pulp infection—a distinction not always easily made, as Kanavel[2] pointed out—may have unpleasant effects even today.

Following a paper by Mr. T. I. Wilson[3] read at a recent meeting of the Medico-Chirurgical Society of Edinburgh, Mr. W. Quarry Wood presented a series of 405 cases of infected hand treated conservatively by chemotherapy without any operative treatment except for pricking a residual purulent blister:- there was no case of necrosis of bone or any other complication. and all the cases made complete recoveries without any kind of disability. These cases were in nurses, and the majority were treated from the earliest stages; but. as Dr. Verney pointed out. there were a large number of advanced and gross infections of the hand among them. which had arisen from concealment of the symptoms.

With such satisfactory results from conservative treatment. I am not convinced that the drastic procedures advocated by Mr. Arden and his fellow workers are to be preferred; I have no doubt at all which method I should choose if I were the patient.

Edinburgh. JAMES A. ROSS.

HEARING-AIDS

SIR,—I read with interest Mr. Read's letter in your issue of Aug. 13. Discussing the 'Medresco' aid. Mr. Read claims that "no training whatever in the use of aids has been given." If this were true the 4000 aids issued in this clinic during the past year could have been handed out in less than a month. The time represented by the remaining eleven months was taken up mainly in trying to provide the training which Mr. Read says is not taking place.

Royal National Throat, Nose, and Ear Hospital, London. EDITH WHETNALL Director of Deafness Aid Clinic.

SPLENECTOMY AND THE HÆMATOLOGIST

SIR,—Your leading article of Aug. 6 calls attention to so many important points that it is the more lamentable that there is no reference to the value of spleen puncture.

In the past. with no easy method of obtaining bone-marrow during life. we did the best we could by drawing inferences as to the state of the hæmopoietic organs from the character of the blood-picture; but now, in any obscure anæmia. marrow puncture is done. and it is indisputable that diagnosis has become more accurate. You appear to suggest that, in the investigation of splenic disorders, blood and marrow examination are all the diagnostic aids at our disposal: this is. of course. not so, because spleen puncture is almost as easy and as safe as marrow puncture. Admittedly, only in certain cases is it essential for diagnosis; but in these it is often the only method of reaching a definite decision. The method is by no means new, having been the subject of a monograph as long ago as 1936[4]; while much more recently it has been discussed by Moeschlin.[5] Indeed, I would say that spleen puncture should now be regarded as a routine hæmatological procedure where there is no contra-indication.

In the same article, you appear to agree with me[6] in deploring the scarcity of hæmatological physicians; and yet you do not criticise the modification of the M.R.C.P. examination, which will no longer demand a knowledge of microscopy (p. 254). If those whose "knowledge of general medicine justifies further training as a consultant" (p. 252) are not to demonstrate the possession of some knowledge of hæmatology, it is difficult to imagine where the hæmatological physicians of a new generation are to come from. Of course, it may be that they will have to train themselves, as we of the present generation have had to do. That would, in my opinion, be excellent, but I have the gravest doubts whether the modern "planner" would be prepared to leave that amount of freedom in his circumscribed world.

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[1] lon, J. B., Mimero, J. D., Scott, J. C. *J. Bone Jt Surg.* 18, 30B, 409.
[2] avel, A. B. Infections of the Hand. London, 1939.
[3] Wilson, T. I. *Edinb. med. J.* 1949, 56, 49.
[4] Weil, P. E., Isch-Wall, P., Perles, S. La ponction de la rate. Paris. 1936.
[5] Moeschlin, S. Die Milzpunktion. Basle. 1947.
[6] Piney, A. *Lancet*, 1949, i. 1023.

London, W.1. A. PINEY.

PARA-AMINOSALICYLIC ACID IN TUBERCULOSIS

SIR,—In the following case of tuberculous ulceration of the tongue and epiglottis, a dramatic result was obtained by administration of *p*-aminosalicylic acid.

A man of 42 was admitted under my care on Dec. 18, 1947, with bilateral tuberculous disease of the lungs. There was a small tuberculous ulcer at the tip and a larger ulcer on the right margin of the tongue; the epiglottis was free of disease. The sputum contained tubercle bacilli. The patient was submitted to a general sanatorium régime. Locally the tongue was treated with 10% 'Promanide' spray, and the marginal ulcer was cauterised by Mr. W. H. Bradbeer. At the end of March, 1948, he was discharged to attend to urgent business. His weight, which had been 9 st. 12 lb. on admission, was now 9 st. 13 lb.

He was readmitted on Oct. 14, weighing 9 st. 2 lb. His general condition had deteriorated. The ulcer at the tip of the tongue had healed but the marginal ulcer was larger and was intensely painful; the epiglottis was now ulcerated and swallowing was extremely difficult.

On Nov. 5 he began to take by mouth the sodium salt of *p*-aminosalicylic acid in a mixture containing to each 3 g. of the drug 1 drachm of syr. aurantii and water to $^1/_2$ oz. The patient received five doses of 3 g. between 6 A.M. and 6 P.M., with a single dose of 6 g. at 9 P.M. Locally, the ulcers were sprayed twice daily with a 10% solution of the drug.

Within three days the pain subsided and appetite returned. The ulcers steadily decreased in size. By the beginning of April, 1949, the tongue had healed firmly and the ulcer of the epiglottis appeared to be quiescent. Clinically and radiologically the pulmonary lesions were unchanged. The sputum, which had been negative for tubercle bacilli on Dec. 13, 1948, was positive on Feb. 14 and again negative on April 27. The patient was discharged on May 5, weighing 9 st. 13 lb.

In my experience *p*-aminosalicylic acid, prescribed in the way described here, gives rise to very few troublesome symptoms; nausea and diarrhœa have always been transient and have subsided promptly when the medicine was discontinued for 48 hours. In my opinion the preparation may be safely administered in the home, and I suggest that early cases awaiting admission to a sanatorium should receive a course of it while having bed rest at home.

Torquay. GEORGE T. ALLERTON.

PREVENTION OF BURNS AND SCALDS

SIR,—In your issue of July 30 Dr. and Mrs. Colebrook discussed prevention of burns and scalds in the home. They did not mention one very dangerous practice—i.e., the use of inflammable materials for "home work" on partly finished factory articles such as rubber and crêpe soled footwear. One young woman in my experience lost her life from the accidental "spillage" of a solution supplied to her husband for "home work," and now a greater disaster has occurred in Bristol from the spilling of a solution for fixing heels to shoes.[1]

It should be possible—and it certainly seems desirable —to forbid the use of rubber solution in "home work." Unfortunately it is always a temptation for those on a low rate of pay to take up easy "home work" such as the finishing of rubber shoes, to help out their earnings. It is not realised how high a risk attaches to the process. It may be all right in a properly designed and equipped factory where all the workers are properly trained, but should be prohibited in the home.

Epping, Essex. FRANK MARSH.

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[1] *Evening Standard*, Aug. 25, p. 1.

THYROID SURGERY

SIR,—In the absence of Mr. Piercy, whc
I should like to acknowledge on his beh
my own, Dr. Friedmann's kind reference
of Aug. 20 to our recent article (July 23).
him that we are not ignorant of the existen
tuberculous" or "giant-cell" thyroiditis,
that in the past it must have often been
tuberculosis of the thyroid? As a mat
was only the realisation of the already
length of our article which prevented
moment from making a brief reference to
and thus forestalling the criticism which w
would otherwise be forthcoming. The
examined and reported on by pathologis
experience in thyroid histology.

London, W.1. J. V

WHY NOT GENERAL PRACT

SIR,—Our hearts are uplifted by your
last week *with its vision of what might*
cast into despair by the realisation of rea
the shape of things is being determined
consultant thought which is imbued wit
segregating all "cases" (not sick peop
specialised pigeon-holes, and appointing te
to cope with each resultant fraction.

In this scheme the general practitioner
except as a preliminary sorting clerk.
has developed to the point where the gyn
not prepared to allow a general surgeon
ovary. (The South-West Metropolitan reg
board is giving effect to this by concentrati
logical cases into one hospital.)

In blunter English, they want wardsfu
women, with no subject of conversation bu
sterility. The psychiatrists, of course, w
out the danger of this, and the logical con
reached when trigonometry teachers wit
tibiæ all go to Tooting, where they ca
tangents. This process is well known in
world, where it is called "breaking down
is the fundamental basis of mass producti
type car may be the perfection of thoughtf
the individual product often has irritating d
parts were fixed by people with no respons
whole.

Is this to happen to medicine? The onl
a whole view are the general physician an
practitioner. The first is nearly extinct;
being gradually throttled. We suffer from
specialist who thinks himself omniscient,
the mighty are very ready to listen. He
G.P.'s mistakes but none of his good wor
unbalanced idea of his value. The G.P. hi
far better position to get a balanced view
of the specialist and is not naïve enough to
the specialist never makes mistakes. These
in fact, are not infallible; they too are hun

But this degradation of the G.P. is no re
It is in progress. In my town we have one
G.P. hospitals in the country. It has a visitin
staff from London teaching hospitals, who
like working with us. Our consultative
department is of inestimable value, both to
and to us as doctors. Our wards are hap
our patients are neighbours who have many
mutual interest.

All this, built up over many years, is to e
end, not because of the ignorance of some non-
committee, but because the medical advisory
to the regional hospital board (who should
their heads in shame) is [illegible] with this c

centration camps. The local doctors are to
t; the consultant staff can go. The hospital
l for selected specialties and staffed by expert
cal people may be admitted if they fit the
1-hole; otherwise, the conveyor belt will take
1other part of the county, where their par-
ase is dealt with. Presumably the woman
ds who also has a hernia and a running ear
the fate of Cæsar's Gaul.

ppeal to those who are pushing these ideas to
oment and ask themselves if they really pay
lip service to the conception of the family
Because we must know, now, where we stand.
your vision of the future, Sir, translated into

Surrey. W. EDWARDS.

ANXIETY NEUROSIS

have read with interest the two illustrative
1 anxiety neurosis appearing in your issues of
1d 20. I am convinced from my own experience
tions of various doctors to this type of disorder
of the greatest obstacles to the treatment and
urotic illness lies in the difficulty many doctors
accepting the validity or the reality of these
ces, and all the misery they produce. They
deny the existence of anxiety of an intensity
on beyond that encompassed by their own
e, and they fail to understand that feelings
dered may be strong enough to overcome a
ocial responsibility comparable with their own.
en forced, by overt changes in the behaviour of
nt, to admit that something is wrong, most of
ard it as a sort of moral lapse to be covered up,
d away by reassurance or by a fatherly homily
ling up one's socks." Owing to his excessive
patient is only too ready to reinforce a moralistic
, and he makes further attempts at repression,
nay be superficially successful but which really
conflicts and symptoms. Some will then
irrational or antisocial behaviour, which excites
affled doctor a desire to chastise. This may well
tor in the present disproportionate popularity of
onvulsive therapy and such mutilating operations
otomy—not to mention the general corrective
towards patients in mental hospitals.

ems that these reactions in the doctor result from
wareness or misunderstanding of the nature of the
state in a neurotic or psychoneurotic illness;
1 his fear of feeling helpless if he once admits
1e patient does have such difficulties, and that
an, in fact, interfere greatly with his personal
ess and to a lesser extent with his social conduct
efulness. Patients are testifying to facts, and
despread incidence of emotional difficulties in the
nity at large bears them out. To deny these
unscientific. Doctors must accept them if they
have a better understanding of the causation,
ent, and prevention of mental illness.

1 writers of the "Disabilities" articles made it
lear that an anxiety neurosis is an illness affecting
1otions, and not primarily interfering with either
elligence or the social responsibility of the patient.
90% of the disturbance consists in subjective
nal phenomena of an extremely unpleasant nature,
are not manifest to the casual observer, or are
nt only in the guise of "peculiarities" such as
ability, bad temper, indecisiveness, or obsessional
Thus if a major breakdown is to be avoided, it is
al that the doctor should listen to, believe, and
eriously what the patient says.

n attempt to explain to some of my colleagues the
tive clinical picture of my own anxiety state, I wrote down the following observations, which may be worth repeating in support of the evidence in the articles. The subjective symptomatology could be defined as the changes in the "general view of life," which rose and fell, with variable frequency and velocity, but with invariable continuity and order, within the following span: (1) ecstasy; (2) enthusiasm; (3) pleasure; (4) tolerability; (5) intermittent uneasiness; (6) frank low-grade anxiety; (7) spasms of severe anxiety with fear or guilt; (8) established anxiety with periods of panic; (9) "intolerable" or "hopeless" anguish; (10) fatalistic unreality with compulsions. Each of these stages had its accompanying physical, intellectual, and emotional aspects, which I will not describe here; but the well-defined directional pattern indicated the organisation underlying a genuine pathological entity, and this gave the lie to the "black magic" explanation which I, and others of my acquaintance, had been wont to accept regarding neurotic symptoms.

There was nothing, at least in the first seven or eight stages, fundamentally different from the experiences of many people under various external stresses and strains. The unusual features were the duration and severity of the disturbance (stages 7, 8, and 9 being predominant for hours or days at a time, and hardly twenty-four hours' consecutive "tolerability" being experienced over a period of many months); and the absence of any rational explanation, in the material circumstances, for the panic reactions. Psycho-analysis provided the rational explanation by linking up the buried conflicts of the past with the panics of the present; and when emotional as well as intellectual fusion of these is attained, the panics do not have to be conquered—they dissolve.

A FELLOW-SUFFERER.

CHRONIC AND UNEXPLAINED ŒDEMA

SIR,—With reference to the article by Dr. Whitfield and Professor Arnott in your issue of Aug. 6, I should like to suggest an additional method of treatment for chronic œdema, which has proved, in my experience, more satisfactory than any of those mentioned.

It consists in the use of radiant heat applied to the legs for about half an hour, followed by careful massage and some exercises against resistance. This should be followed by bandaging the patient's legs and allowing him to walk about freely.

London, W.1. P. S. FLEISCHMANN.

MIGRAINE

SIR,—Dr. Hay's letter of Aug. 20 draws attention to the fact that—contrary to the opinion of many—migraine is not entirely resistant to therapy.

Vasoconstrictors and anti-histamine drugs when given early enough will prevent the onset of attacks in some cases; but they do nothing to alter the pathological condition which is the cause of the disease. For the patient it is the perpetual fear of headache that is so depressing, since no future arrangement is ever safe from interference.

Migrainous attacks can be divided broadly into two classes: (1) those with an underlying endocrine dysfunction (typified by the "menstrual migraine" of women, but present in men too); and (2) those associated with histamine sensitivity, which by some unknown mechanism appears to result in hemicranial arterial dilatation.

It is true that some cases resist all forms of therapy. But the success of treatment with anterior-pituitary-like hormones in cases of endocrine migraine,[1] or with histamine or neostigmine desensitisation in those giving a positive intradermal test,[2] is encouraging often enough to warrant universal trial in place of the routine "aspirin and bed." This type of therapy is directed to eradicating the attacks, or at least reducing their number and severity, rather than to aborting a headache when it arrives.

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[1] Moffat, W. M. *J. Amer. med. Ass.* 1937, 108, 612. Leyton, N. *Lancet*, 1942, i, 448; *Med. Pr.* 1944, 211, 302.

London, W.1. NEVIL LEYTON.

A LIGHTWEIGHT RESPIRATOR

SIR,—The account of the Monaghan respirator given in your issue of Aug. 13 (p. 308) did not describe its mechanism. It acts on the principle of alternating negative and normal pressures within the dome of the cuirass, through which movement of the abdominal wall and anterior part of the chest effects descent and relaxation of the diaphragm and some expansion of the chest. It is therefore merely a limited application of the principle which operates in the Drinker respirator. There are six sizes of cuirass. I recently saw and tried the machine in the U.S.A. and feel that it has a value in cases which require some assistance but not complete dependence upon a respirator.

Western Hospital, W. HOWLETT KELLEHER
London, S.W.6. Physician-Superintendent.

PROS AND CONS

SIR,—Professor Alstead's statement, in discussing the membership examination last week, that "nobody willingly submits to the depravity of acting as an examiner save from a sense of duty or out of regard for the financial reward," must not be allowed to go unchallenged.

It has been my privilege and pleasure to examine for one of the specialist diplomas, and my term of office was not only enjoyable but also instructive. Meeting one's colleagues, and learning from them and the candidates, has been a stimulating experience which has done much to remove my sense of isolation as a provincial teacher. I hope examining boards, when appointing their examiners, will keep this aspect in mind and recognise the value of an examinership to younger provincial teachers.

EX-EXAMINER.

OSTRACISM OF THE TUBERCULOUS

SIR,—I am grateful to Dr. Foster-Carter (July 30) for his generous support of my plea for the tuberculous (July 16).

The evil is not confined to the British Isles. I have personal knowledge of a family of healthy people who were emigrating to the U.S.A. to join relations long resident in that country. No symptoms or signs of disease were present in any member of this household; but because an obsolete, calcified lesion was discovered in the wife's chest her visa was cancelled, the family's plans ruined, and a stigma placed upon them that they may never outlive.

A naval pensioner for tuberculosis was discharged from the Service with his disease quiescent, and obtained work as a clerk with a gas undertaking. Whilst so employed he unfortunately developed signs of reactivation and was admitted to a sanatorium, from which he was ultimately discharged with a selective artificial pneumothorax and with his disease quiescent. He was now fit to return to work; but a deputation of his fellow workers told the manager that if he came back they would leave, as they had no intention of taking tuberculosis back to their families. The manager, in spite of medical reassurances, timorously gave in and referred the matter to London. There the matter rests. The patient is left in agony of mind, fearful that without
cause and by the influence of ignorance, pre
uncharitableness his livelihood may be taken

Sir, these problems are now a national co
they ought to be dealt with at national level
culosis is a scourge of no less magnitude than
gonorrhœa, and diphtheria ; and it is difficult
stand why, when the menace of venereal
shouted from every hoarding and newspaper
Ministry of Health, the quiet facts of tuber
the truth about its infectivity and means of
not similarly advertised. Tubercle is indeed a
that walketh in darkness ; and it will continue
despite the efforts of workers in this specialty,
blaze of light is thrown upon it.

Finally, may I reply to the adverse criticis
Snell (Aug. 6)? My suggestion that "active
pulmonary tuberculosis can be nursed in gen
. . . without the smallest danger" plainly state
and the need for precautions is so obvious a
require mention. There are unavoidable ha
walks of life, and that of tuberculous infectio
which the nursing and medical professions
take. The relatively higher incidence in these
doubtless due partly to the absence of routine p
in general hospitals. In two such hospitals
I am associated no Mantoux testing at all
until it had been repeatedly insisted on;
omission did not prevent complaints being m
Mantoux-negative probationers developed prima
plexes. General hospitals are casual not
ignorance but by reason of their firm convict
pulmonary tuberculosis is no business of their
it should never sully their wards.

No-one, except possibly the general hosp
quarrel with Dr. Toussaint's pertinent remarks
issue of Aug. 13. Those of us who are less h
than he will continue to hope that one da
general hospitals will accept their share of res

Chest Clinic, Folkestone. B. G. EDELS

HOSPITAL DISCIPLINE

SIR,—Miss McManus said not long ago: "
is necessary in all walks of life, Services, busi
the home. It instils into the minds of studen
the need for complete accuracy and reliability,
young nurses carry life and death in their han

But discipline in hospital is not related to th
home, business, industry, or other professions
ficantly, I think, hospital discipline and eti
a mongrel—half military, half conventual.
stuff about discipline strengthening the ha
"carry life and death" needs looking into.
too, have a hand in carrying life and death
bus-drivers, passenger-train drivers, and traff
men. But does the bus-conductor deferentia
his hands behind his back and escort the driv
from the bus, opening the door and standing re
till the driver is seated? Does the university
interest himself if his medical students refuse
Does the medical superintendent decide whe
doctors may wear whiskers, moustache, colour
or the wrong studs? I remember a nurse bein
the dinner-table on pay-day: "Now you can g
buy studs the same as those the other nurses ha

I was at a training-school which, to use
phrase, "thought itself the whole cheese."
was inflexible. We were required to account
lateness if half a minute overdue; we were no
to appear without cuffs, cap, and full regal
sitting-room; to be seen smoking—even off
town or café or cinema—rendered us liable t
dismissal; senior nurses ignored junior nurs
passing in corridors—it was all in fact like a

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[2] *J. Lab. clin. Med.* 1942, 27, 1546. Leyton, N. *Med. Pr.* 1944, 211, 302. Halasy, M. *Brit. Med. J.* 1949, i, 1121.

rody of a girls' school. Nurses were terrified rs and staff nurses. Now how reliable were ses?

ss of the number of patients, work had to at the time expected by the sister of the miraculously, it always seemed to be done was perplexed, and wondered why I alone wash sixteen children in twenty minutes. guy" nurse came to help me, and this is how A basin—one basin—was brought into the et on the enamel table. Then she went round children and collected "face-cloths." (These s of old blanket curiously transformed into like a strip of cold porridge or tripe.) All face- e put together into the basin, then wrung ng to each child. Delighting in this catch-ball children jumped and caught the cloths, gave a "dicht" as we say in Scotland, then stuffed gy bits of blanket into their lockers. The job in the appointed time—before sister returned I assure you that nowhere is white paint and tenderly nursed than in that hospital.

not multiply instances. I think nursing is a t job, and it is incongruous and unrewarding our training on either the nineteenth-century a girls' prep-school. I know nurses are little n schoolgirls when they start, but need we do o keep them still schoolgirls at sixty?

RACHAEL.

THE SEVEN SINS OF MEDICINE

hope someone has told the students who to Dr. Asher, whose address you published , that: (1) cerebral tumours are not common, not rare either; (2) some of them are curable; refore you dismiss every case of headache and with the word "migraine," from time to time contribute to a horrible and unnecessary death; aine, despite Dr. Asher's implication to the is sometimes a symptom of a cerebral tumour; patients with rare diseases need diagnosis and and (6) if you have any love of knowledge, bound to be both a lover of common things and

A LOVER OF THE RARE.

ELECTRICAL ANÆSTHESIA

As an electrical engineer interested in the gical effects of electric currents introduced into y, I particularly noticed the annotation on this in your issue of Aug. 6.

regard to Leduc's work in 1902, I should like attention to relevant contemporary investiga- Kouwenhoven [1] reports that neither he nor other ators have succeeded in reproducing Leduc's while Hertz [2] has found that anæsthesia was d in neither animals nor man. The patient be rendered unconscious and breathing would nless the shock was carefully controlled.

erning the electrical stunning mentioned in the ion, its principal use in abattoirs in this country he slaughtering of hogs; the consequent increase od-pressure is greater, and thus gives better g, than with other methods.

nis connexion the term "narcosis" is preferable æsthesia" as the unconsciousness rarely lasts for nan a few minutes after the shock, and in practice rent cannot be passed continuously through the Moreover, unless the current is carefully restricted w value, convulsions are likely to occur.

ord. T. J. WYNN.

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enhoven, W. B. *J. Amer. Inst. elect. Engrs*, 1949, 68, 199.

, J. *Rev. Path. comp.* 1933, 33, 385.

Obituary

HIBBERT ALAN STEPHEN NEWTON

KT., M.S. MELB, F.R.C.S., F.R.A.C.S.

Sir Alan Newton, a former president of the Royal Australasian College of Surgeons, who died on Aug. 4, was one of the acknowledged leaders of surgery in Australia.

Hibbert Alan Stephen Newton was born in Melbourne in 1887, the son of Hibbert H. Newton, Clerk of Parliaments, Victoria, and he was educated at Haileybury College, Melbourne, and the University of Melbourne, where he graduated M.B. in 1909, obtaining first place in the final honours lists and the Beaney scholarship in surgery. After holding posts at the Melbourne Hospital as resident medical officer and as registrar he was appointed an honorary surgical clinical assistant in 1912. In the same year he obtained the M.S. of the University of Melbourne. Before his appointment the following year as surgeon to outpatients at the Melbourne hospital he spent several months in London working under Sir Victor Horsley at University College Hospital and at Queen Square.

[Barratts

During the 1914–18 war, with the rank of captain and later of major in the A.A.M.C., he served for a time in a casualty-clearing station in France, and in 1919 he was attached to the 3rd Australian auxiliary hospital at Dartford; it was while holding this appointment that he obtained the fellowship of the English college.

After his return to Australia he resumed his appointment as surgeon to outpatients at the Melbourne Hospital, and in 1927 he was appointed surgeon to inpatients and lecturer in clinical surgery.

Although he had one of the busiest surgical practices in Melbourne, Newton had many other interests. He was associated with the early formation of the Melbourne Permanent Postgraduate Committee, and he was one of the prime movers in the foundation of the Royal Australasian College of Surgeons. Its development owes much to his influence, and he held the offices of censor-in-chief, vice-president, and from 1942 to 1945 of president. He was also a member of the councils of Trinity College and the University of Melbourne, the board of the Walter and Eliza Hall Institute of Medical Research, the medical board of Victoria, and the council of the Victorian centre of the St. John Ambulance Association. He was an honorary fellow of the American College of Surgeons and a fellow of the British Association of Surgeons. In 1936 he was appointed knight bachelor.

During the late war, with characteristic vigour, he did not spare himself despite his failing health. From 1939 to 1945 he was a member of the Central Medical Coördination Committee and for three years he was deputy chairman. He was appointed consulting surgeon to Army Headquarters in Melbourne, and from 1940 to 1945 he held the highly important post of chairman of the Medical Equipment Control Committee. In 1942 he was as quick to realise the vital necessity of getting all the quinine possible out of Java, as he was later to appreciate the need to speed the manufacture of other essential drugs such as sulphaguanidine.

In his later years, Newton's health did not permit him to continue his practice, but in 1947 he was appointed Stewart lecturer in surgery at Melbourne, and here he carried on with determination but at last succumbed to an illness which had almost carried him off a year earlier.

An Australian correspondent adds: "A general surgeon of great merit, Newton was particularly interested in the surgery of the thyroid. He was devoted to teaching and in this he excelled. His students, who held him in great affection, flocked to his ward-rounds and lectures. A man of outstanding personality, he had a tall and imposing presence and a grand manner. He had a great influence on the development of surgery in Australia, particularly in Melbourne, and so long as there is a Royal Australasian College of Surgeons there is likely to be a special shrine for Newton."

In this country Newton had also many friends, and his British colleagues Sir Gordon Gordon-Taylor and Prof. C. Lambert Rogers write: The death of Alan Newton has robbed the southern hemisphere of its dominant surgical figure. From the first he seemed to have been created in the heroic mould: fortunate in his parentage and forbears and in his educational background, he was destined to take the leading place, assured and unquestioned, in whatever profession he chose. His particular vintage year of medical undergraduates at Melbourne University was brilliant, yet in this galaxy of able young men Alan Newton secured each session the premier place with ever-recurring, almost mathematical certainty.

A visit to England in his early postgraduate period brought him into close contact with such stimulating personalities as Victor Horsley and Arthur Hurst. The atmosphere of Horsley's experimental neurosurgical laboratory remained an unfading influence with him, and in the early years after the first world war he continued in Osborne's physiology department in Melbourne the work he had begun in University College, London. The catholicity of his surgical interests, however, may be gauged from his writings, and although his name is perhaps pre-eminently associated with thyroid surgery, his communications to the medical press—he was most loyal to the *Medical Journal of Australia*—embraced almost every aspect of surgical work. In the treatment of the mundane hernia his operation was based on the method first described by his fellow citizen and former teacher, Hamilton Russell: he could deal with a gastrojejunal ulcer with the consummate artistry of Moynihan or Bland-Sutton; his successful end-to-end suture of a pancreas ruptured by a playful pony's hoof rightly belongs to the annals of abdominal surgery; as a good anatomist, who had also been a lecturer on surgical anatomy in Melbourne University, he displayed a preference, where possible, for the incision along the outer border of the erector spinæ for the exposure of the kidney rather than the carnivorous Morris incision which bisects the unfortunate patient. His paper on gunshot wounds of the cranium, in the *British Journal of Surgery* in 1919, doubtless bore the impress of Harvey Cushing as well as Horsley, for he had made contact with the great American neurosurgeon in the Ypres salient in 1917. In all Alan did his gentle, precise, bloodless, yet rapid technique revealed him to be one of those natural surgeons whom the tissues obeyed.

Nature had endowed him with the gift of stature and he commanded notice in the crowd and in the councils and assemblies of men. None who have attained the dignity of the woolsack of the Royal Australasian College of Surgeons can have worn its presidential robe more correctly or fittingly or conducted meetings with more decorum; and yet we wonder whether he may not have achieved more in his efforts to promote the prestige and influence of the college which he had so much at heart during the many years when he was censor-in-chief and the power behind the surgical throne. He possessed all those qualities which make for leadership, but he was more than a leader, he was a statesman indeed.

It has sometimes been said that orators are not often successful statesmen, but Alan Newton's sagacious surgical statesmanship was beyond all cavil. His able chairmanship, his marvellous vision and rapid decision in connexion with the Medical Equipment Control Committee made him one *qui de re publica optime meritus est.* Those who have listened to his oratory will remember his addresses for all time, for the mastery of phrase, the wondrous imagery of words, the impeccable English, and the sentences that flowed with almost contemptuous ease, commanding attention and sweeping away opposition like a river in spate, placed him in a class to which Moynihan or Paget belong.

"He does not die who can bequeath
Some influence to the land he knows."

Sir Alan Newton married in 1919 Miss Mary Cicely Wicksteed of Headingly, Yorkshire, who survives him with a son and a daughter.

THOMAS CRISP ENGLISH

K.C.M.G., M.B. LOND., F.R.C.S.

Sir Crisp English, consulting surgeon to S Hospital, died at his Norfolk home on Aug age of 71. We owe the following memoirs colleagues:

* * *

When I first joined St. George's Hospital year student, Crisp English had just finished appointments and soon afterwards, in 1903, final F.R.C.S. examination while still under I entered the wards he had just been appointed surgeon at the early age of 26, and he soon mark as a forceful teacher and a brilliant, speedy, and accurate operator. He was, at that time, always willing to take risks and to embark on new and difficult procedures. As far as I am aware he was the first surgeon at St. George's to perform gastrectomies—in those days for malignant diseases only—and to remove the gasserian ganglion for trigeminal neuralgia. I was his house-surgeon when he was senior assistant surgeon and I owe much to him for the help and advice that he gave me then and later. He was always ready to help his juniors by advice, by actual assistance at operations, and more valuable still by the use of his beds for their cases.

During the 1914–18 war English, after a s of service in France, was transferred to Salo he served with distinction as consulting surg in France he did much to emphasise the advocated and applied by Owen Richards only rational treatment for abdominal wou early operation. After the war his priva became so large and burdensome that he himself in his hospital work with the and accurate performance of relatively mi procedures and tended more and more to a interferences likely to be fraught with difficult Though continuing to teach he left a considera of his routine work to his juniors. Outside hi English had few interests and apart from in his younger days he had no inclination towa recreations. He was, however, a past Goldsmiths Company and took a great in work of that body over a long period. Dur few years he had been in failing health and was accentuated by the death of his wife, was devoted, some three years ago.

My first meeting with Sir Crisp remains my mind. He had come to a west country *consultation* and after it was over I had be to show him the way back to the railway sta *return journey.* He was wearing, I particularl though it is nearly thirty years ago, a long coat with an astrakhan collar, and with step, charming manner, and distinguished entirely fulfilled the picture which my youth *tion had* conceived of a London consulti Later as dresser and house-surgeon I wa him better and like many others in this positio many kindnesses from him, but he was neve open his heart to more than a very few outs intimate *family circle.* Inseparable in his from his wife and daughter, to whom he w his work was his hobby, though he beca gardener and it gave him great pleasure that to cultivate a pink rose of much beauty whic the "Lady English", rose.

Gifted with an exquisite pair of hands, his when operating, in their precision and neatn joy to behold and an education to the you ut speculate what fields he might not have had he maintained the wide range of surgery ed in his early days and not narrowed his the main to the right lower quadrant of the Knighted but a short time after his 39th e came to have perhaps more national figures patients than any other surgeon of his genera- vas characteristic that he never talked about uished patients or mentioned their names in nversation, and this natural reticence perhaps hy it is not more generally known that he saved the life of Mr. Winston Churchill at the famous Dundee election in 1922. Appendicitis diagnosis, and counsels which might have advised postponing the operation until the Sir Crisp insisted on operating immediately hat night he removed a gangrenous appendix ted a tube. The patient, fractious at his ion, travelled to the North a few days later his drain still in situ fought and lost the election eel-chair. The great statesman has put it on t he returned without a seat, without prospects, ut his appendix.

V. H. R.

of Dr. Thomas Johnston English, Thomas Crisp s educated at Westminster School and St. George's where he held the William Brown scholarship. lifying in 1900 he was in the same year awarded ison scholarship of the Royal College of Physicians ears later the Jacksonian prize of the Royal College ns. In 1903 he obtained the F.R.C.S., and in 1904 ond. Besides his appointment at St. George's he e staffs of the Queen Alexandra Military Hospital, the Hospital of St. John and St. Elizabeth, King II's Hospital for Officers, the National Orthopædic and the Grosvenor Hospital for Women. An earlier ent was that of medical officer in charge of troops wer of London. During the 1914–18 war he served ing surgeon in France, and later, as consulting o our Forces in Salonika and in Italy. He was d four times in despatches. From 1918 to 1919 he mber of a War Office medical board. For these war he was appointed C.M.G. in 1917 and promoted he following year. He was also a knight-commander ler of George I of Greece, and a member of the order ava of Serbia. A Knight of Grace of St. John of n, he was a member of the chapter-general of r. After his retirement he published *Patients and itis* in 1946 and *Diseases of the Breast* in 1947. Sir glish married Miss Annie M'Leod, in 1905. She 946 and they are survived by their only daughter.

WILLIAM TURNER WARWICK

M.A., M.B. CAMB., F.R.C.S.

W. Turner Warwick, senior surgeon to the ex Hospital, died in the hospital on Aug. 21, ge of 61.

arted his medical studies in the medical school 1911 when he was an entrance scholar. At dge he had already obtained an honours degree hematics, and a half-blue for athletics. His -school career was distinguished and rapid, qualifying in 1915 he was awarded the Broderip ship. After a number of house-appointments he the R.A.M.C., serving in France. After the war, resident surgical officer at Leeds, where he came the influence of Moynihan, and at St. Mark's al, which started his life-long special interest in diseases. In 1920 he took the F.R.C.S., and two later he was appointed surgical pathological r at Middlesex, an appointment which profoundly ced his medical outlook. In the Bland-Sutton te of Pathology he worked under the director— e James McIntosh—and in close association with olleagues as Dodds, S. L. Baker, Lionel Whitby, carff. In 1923 he was appointed as a general n to the honorary staff of the hospital, a few years aking on in addition the department of proctology.

he outbreak of war in 1939 part of his work was erred with the Middlesex sector to Northwood tal. Owing to the simultaneous transfer of part of adiotherapeutic activities to the same hospital, his opinion began to be sought by his radiological colleagues on a wide variety of surgical problems connected with cancer. And at the time of his death he had built up a big reputation in this field. It was because of the same interest that he followed Sampson Handley as director of the diagnostic and advisory cancer clinic at Bournemouth.

D. H. P., to whom we are indebted for this memoir, writes: "Warwick's specialty was proctology. His written contributions to the subject were not numerous. but among them were two important articles on colostomy. He was an early convert to the simultaneous combined technique of abdominoperineal excision, and he had interested himself in the technique of preserving the anal sphincter in carcinoma of the rectum. A keen attendant at proctological meetings, in discussions he usually presented an original point of view which was always received by his colleagues with interest and respect. In wider fields he was one of the first in this country to recognise the new vistas opened for cancer surgery by the modern meticulous technique, a technique in its turn rendered possible by modern anæsthesia, supportive therapy, and chemotherapy. It was a matter for general comment among his colleagues how well cases of, for example, extensive resections of the mouth and jaw, extensive resections in the pelvis. or hind-quarter amputation used to do in his hands. Careful deliberate surgery was admirably suited to his temperament. The superficial and flashy were abhorrent to him. Colleagues consulting him on a difficult case could be assured of an opinion which was always profound and often original. His early training in mathematics had left him with an independent intellectual outlook, later conditioned by a deep understanding of pathological processes.

"Apart from proctology and cancer, he was particularly interested in varicose veins, and his book, published in 1931, on the rational treatment of varicose veins and varicocele is a classic. His work on varicocele provides the only satisfactory explanation yet given of the cause of the condition. He was also attracted by the problems of bone growth and gave a Hunterian lecture on the subject in 1942.

"He was always interested in students and the problems of teaching, but as teacher he was hindered by a hesitating delivery and a difficulty in putting his ideas into simple language. He was a good examiner, especially aware of the generally neglected problem of increasing the efficiency of examiners and examinations. In committee he was wise; at times his tendency to dig in until his point of view had been properly considered could be trying, but it was usually a point of view worth considering. His work as chairman of the medical committee of his hospital during the difficult period of transition from voluntary hospital to national hospital was outstanding.

"The most delightful of colleagues. he had a strong sense of humour and a shy but unaffected personality. As often with men of commanding stature, his gentleness. kindness, and simplicity of bearing were striking. Some men go on maturing all their lives. Turner Warwick was one of these. And when he was struck down he stood higher in the esteem of his colleagues than ever before."

Mr. Turner Warwick married in 1921 Miss Joan Harris who is also a doctor, and they had three sons and a daughter. His eldest son, like him, is a blue and a Broderip scholar.

JAMES FERGUSON

C.B.E., B.A., M.B. R.U.I.

Dr. James Ferguson, late medical officer of health for Surrey, died at St. Helier Hospital on Aug. 27. He was born at Muckamore. co. Antrim, in 1879 and educated in Belfast at the Royal Academical Institution and at Queen's College. A foundation scholar in classics, he gained an honours degree in arts in 1902, before qualifying in medicine in 1908.

His early training in public health was received in one of the best schools of experience in England—under Dr. J. J. Butterworth of Lancashire. From the post of chief assistant there he was appointed, in 1929, medical officer of health to the Surrey county council and he served in that capacity until his retirement in 1946. From that time he acted as a principal medical officer of the Ministry of Health, an appointment in which his long experience of hospital and health services was of great value. He was created C.B.E. in 1946, and was an honorary physician to the King from 1941 to 1944.

At the time of Dr. Ferguson's appointment to Surrey the transfer of municipal hospitals was taking place, and so the creation of a county hospital service was one of the most urgent duties of the new medical officer. He threw himself heart and soul into this work and became a leading authority on hospital planning. The St. Helier Hospital is a monument to his judgment and skill. The nurses' home has been named Ferguson House and it will be a memorial to his work. Dr. Ferguson was a keen supporter of voluntary organisations; in addition to his coöperation with the voluntary hospitals he devoted much of his time to service with committees, one of his special interests being the welfare of the blind. In his own professional sphere he served actively on committees dealing with hospitals and the welfare of nurses, and on the preventive medicine committee of the Medical Research Council. He was also a member of the medical advisory council of the Nuffield Trust and Foundation.

During the whole of the late war Dr. Ferguson lived and worked in the danger areas, giving his support and strength to the maintenance of hospitals and civil-defence services. His unhurried speed was always effective in promoting morale. He had no oratorical gifts, but his soft Ulster speech and gentle persuasive ways carried many a stubborn argument. He had a happy life, at home and at work. One of his constant joys was his relationship of mutual trust with the Surrey county council, and the years of unbroken friendship with his fellow officers in their public-health service. For seventeen years he was the devoted servant of a great local authority whose members regarded him with affection and respect.

Dr. Ferguson is survived by his wife and daughter.

Public Health

Control of Milk Production

REGULATIONS, made jointly by the Ministries of Food, Health, and Agriculture and Fisheries re-enact with amendments the Milk and Dairies Regulations, 1926–43, and the Milk (Special Designations) Regulations, 1936–48. These new regulations, which come into force on Oct. 1, give effect to provisions in the Food and Drugs (Milk and Dairies) Act, 1944, and the Milk (Special Designations) Act, 1949, in which the Government prescribed measures to improve the standard of purity of milk.

Under the Milk and Dairies Regulations, 1949, the Minister of Agriculture and Fisheries becomes responsible for the registration of dairy farmers and farms, the inspection of cattle on dairy farms, and the enforcement of the regulations on dairy farms (unless they relate to diseases communicable to man). Local authorities are still responsible for the provisions which apply to milk distributors other than dairy farmers, and for the registration of these milk distributors and of dairies other than dairy farms. Local authorities continue to be reponsible for the provisions relating to diseases communicable to man. As regards infected milk, the present powers are extended to enable a medical officer of health to stop the sale of milk, or to require milk to be diverted for heat-treatment, if there is evidence that it is infected with organisms pathogenic to man. A medical officer of health may also require milk to be diverted for heat-treatment if he has reasonable grounds for suspecting that it is so infected.

Under the Milk (Special Designation) (Raw Milk) Regulations, 1949, the designations authorised for raw milk are "tuberculin-tested" and "accredited." The use of the designation "accredited" will not be permitted after Oct. 1, 1954, while from Oct. 1, 1957, the designation "tuberculin-tested" may be used only for milk from an attested herd.

The Milk (Special Designation) (Pasteur- Sterilised [illegible] 1949, authorise th the special [illegible] steurised" and "s milk, and [illegible] priate licences are special designations "tuberculin-tested milk ised)" and "tuberculin-tested milk (sterilised) Oct. 1, 1950, pasteurised milk will be sold only or other containers, and from Oct. 1, 1951, th or other containers must be filled at the p premises.

Poliomyelitis

In the week ended Aug. 20 notifications poliomyelitis 273 ,(236), polioencephalitis Figures for the previous week are shown in

Multiple cases (poliomyelitis and polio together) were reported from the following London 35 (30), Bedfordshire 4 (2), Berkshir Buckingham 2 (2), Chester 6 (4), Cornwall 8 9 (1), Devon 9 (9), Durham 2 (3), Essex 10 (19), 5 (7), Hereford 2 (4), Hertford 3 (1), Kent 6 (6), 29 (23), Leicester 7 (4), Lincs Lindsey 3 (1), (10), Norfolk 3 (3), Northants 6 (2), North 7 (4), Nottingham 10 (4), Oxford 2 (1), Some Southampton 11 (13), Stafford 6 (4), Surrey 7 East 2 (5), Sussex West 3 (4), Warwick 4 shire 4 (2), Yorks, West Riding 50 (34), F Monmouth 2 (4).

The Ministry of Health draws attention previous remarks on tonsillectomy in ar poliomyelitis is prevalent: "Surgeons shou take the local prevalence of poliomyelitis int when considering the desirability of operat particular child." (See *Lancet*, July 30, p. 215.

Appointments

BAILIE, H. W. C., M.B. Belf., F.R.C.S.E.: surgeon, Co co. Derry, Northern Ireland.

BRODY, M. B., M.D. Sheff., D.P.M.: director of research, Hospital, Chichester.

BUTTLE, R. L., M.R.C.S., D.P.M.: consultant psychiatri Mental Hospital, Cambs.

CHRISTIE, A. L. M., M.B., PH.D. Lond., M.SC. N.Z.: sec pathologist, Norfolk and Norwich Hospital.

COLEMAN, P. N., M.B. Birm.: asst. pathologist, M group of [illegible]

COOK, E. H. [illegible]: part-time clini Eye, Ear [illegible] Liverpool.

CORFIELD, H. [illegible], D.A.: specialist West Cumberland hospitals.

CULLEN, C. H., M.CH. Belf., F.R.C.S., F.R.C.S.I.: orthop Leigh Infirmary, St. Helens Hospital, Booth H &c., Lancs.

GRACIE, A. P., M.B. Edin., F.R.C.S.E.: accident officer, S Hospital and Hope Hospital, Lancs.

HEWAT, J. K., M.D. Dalhousie, D.P.M.: physician, Kno Fareham.

HEWITT, J. C., M.B. Belf., D.A.: anæsthetist, Colera Derry, Northern Ireland.

HOLLAND, C. B., D.S.C., M.B. Manc., D.A.: specialist Ipswich area.

HUDSON, K. R., M.B. Durh., M.R.C.O.G.: obstetrician logist, Lurgan area, co. Armagh, Northern Irela

JUSTICE, J. J., M.B., B.SC. Glasg., D.P.M.: psychiatris Hospital, Stannington, Northumberland.

KIRKHOUSE, E. S., M.D. Durh.: specialist venereologist group of hospitals.

KLUKVIN, B. N., M.B. Durh., D.M.R.-D.: radiologist, T Wansbeck hospital groups.

LEDINGHAM, L. A., M.B. Aberd., M.R.C.O.G.: temporary and gynæcologist, Bolton.

MCNAB, G. R., M.D., B.SC. Edin., F.R.C.P.E.: physi tendent, Ipswich Sanatorium.

MAYON-WHITE, R. M., M.D. Lond., M.R.C.P., D.C.H.: Ipswich area.

ORR, C. J. K., M.B. Belf., D.A.: anæsthetist, Ballym Antrim, Northern Ireland.

PARKER, W. R., L.R.C.P.I.: radiologist, Dryburn Hospital.

PATTERSON, J. H., B.A., M.B. Camb., M.R.C.O.G.: obs gynæcologist, Omagh area, co. Tyrone, Northern

PAULLEY, J. W., M.D. Lond., M.R.C.P.: part-time special Ipswich area.

PEBERDY, G. R., M.D. Durh., D.P.M.: asst. specialist unit, Newcastle-on-Tyne General Hospital.

PIMBLETT, G. W., M.A., M.B. Camb., D.M.R.-D.: radiolo Hospital, Thornton Heath.

RAFTERY, LILIAN, M.R.C [illegible] g gynæc George V Springfiel [illegible] atal.

STEWART, C. J., M.D. [illegible]: cons physician, Ipswich

TEMPLE, R. W., M.B. Dubl., [illegible], M.R.C.P.I.: physici area, co. Derry, Northern Ireland.

WILSON, W. W., M.B. Manc., F.R.C.S.: surgical chi Christie Hospital and Holt Radium Institute, Ma

Notes and News

OVERDOSE OF AMPHETAMINE

rateful to Dr. Richard Worsley for the following

d 2$^{1}/_{4}$ years, was seen in the casualty department ls Public Dispensary and Hospital at 2.50 P.M. 2. The mother stated that one to two hours the child had swallowed some "energy" tablets son had acquired while serving in the Forces in e produced a small unlabelled tube which still en tablets. The full tube would have held twenty d the mother did not know how many the tube ned before the child got hold of it. The tablets 5 mg. amphetamine sulphate tablets, and some or analysis. A stomach wash revealed no trace of

The child appeared normal in all respects and was after the mother had been instructed to bring her if she noted anything unusual. At about 11.45 P.M. vening, the mother returned with the child, who veractive and would not stay in bed. Both had st of the 3 miles to the hospital. The child was o the ward. On examination no abnormality was cept overactivity and refusal to stay in bed. At she was given chloral hydrate gr. 5; she settled A.M. and slept until 4 A.M. At 6 A.M. this dose ed as the child was noisy and restless: she was at 8 A.M. and remained so throughout that day aking her food normally. After a further dose of 5 P.M. the child slept for an hour and then had a ht's sleep without further sedation. She was dis- om hospital next day, Aug. 24, quite normal in

d's condition did not cause any real anxiety to those

Some of the tablets were undoubtedly absorbed, nsomnia and excitability were compatible with etamine intoxication.

HE INDIAN MIDDLE-CLASS BUDGET

where the Indian middle class has suffered more om inflation since 1939 than any other section of unity. This is brought out by a report on family mong middle-class State employees of undivided ntly published by the central government. This a sample of 5000 persons drawing less than Rs. 500 1, subdivided according to residence in four major seven regional groupings. It gives an illuminating o their living conditions. Since it covers budgets 1946 it is somewhat out of date, but has the advan- ing on the conservative side inasmuch as the impact n is now more severe. It has the additional merit g Pakistan as well.

ng to this report average family incomes ranged 159 per month in rural Madras to Rs. 286 in Delhi, and allowances of the head of the family accounting % of the total. The average was depressed by the n of regarding all clerks—sometimes on a monthly y as low as Rs. 30—as members of the middle class. ess, it was found that only one in five of the Madrasis in five of the Delhi residents had surplus budgets. ntage of families in debt varied from 37% in the over 75% in Calcutta, the main causes of indebted- g sickness and marriage expenses. Resident depen- family earner ranged from 4·5 in Bombay city to har and Orissa, and non-resident dependents from adras to 1·4 in the United Provinces. The report that "expenditure was nowhere in reasonable dence with family income." Up to half the income t on food, milk, and fats. In housing government are far better placed than the general mass of people, they lived at an average density of 1·9–2·8 persons ; the cost of 10% or a little over in cities was not , but the quality was deplorable. Fuel and clothing 12–15% of the income. The miscellaneous residue % was expended on travel to work, children's educa- et and household requisites, postage, medical bills, rvants, laundry, share of a sweeper, &c.; outlay on pansupari, and holidays was relatively modest, yet s little margin left for a rainy day.

details make depressing reading. Nor is there any and immediate remedy. Continuous wage pressure s to the inflationary spiral. Permanent improvement of middle-class incomes, as indeed of others, can only come from greater productivity. Richer classes in India, apart from war-time profiteers, may be poorer than they were, but have greater scope for economy. Among the labouring poor there is undoubtedly distress; but the organised worker at least, aided by arbitration tribunals and cost-of-living awards, has to some extent been cushioned against the worst effects. The middle classes have standards of respectability to maintain and relatives and dependents to support. Among them government employees are in a comparatively privileged category, and the disabilities they suffer weigh more heavily on less privileged sections of the middle class.

MODERN PATTERNS IN CANCER RESEARCH

BIRD'S-EYE views of medicine are unsatisfactory unless the bird appointed is something of an eagle: for it takes a widely ranging eye to see enough of any field to survey it fairly. The New York Academy of Medicine's lectures to the laity have long been given by accepted eagles; and the set of six lectures published in *March of Medicine, 1948*,[1] are authoritative little surveys of the atom in civil life, food and civilisation, on being old too young, perspectives in cancer research, psychiatry for everyday needs, and the interrelation of pure and applied science in the field of medicine. All of these are worth reading, by doctors no less than by laymen, but in his discussion of cancer research Dr. Cornelius P. Rhoads, director of the New York Memorial Hospital, is perhaps specially adept in bringing an exuberant subject into perspective.

Cancer is rightly being examined in many ways at once: growth in general is being studied by chemical, physical, and biological methods, and so is the behaviour of cancers, without reference to cure; at the same time new methods of control and cure are being devised, and existing methods of diagnosis and treatment are being steadily improved. In spite of some equivocal evidence it is not possible to indict a virus finally as a cause of cancer in mammals; and even if it were, Dr. Rhoads asks, what would have been gained in terms of cancer control? The finding would only suggest, he thinks, that cancer might be contagious, and that patients should be isolated to avoid infecting others; and, since we know from experience that this is not so, we should not be much further on. In other words, discovery of the cause will not necessarily lead direct to the cure. Genetic studies have produced another kind of puzzle. X rays can cause mutations in strains of bacteria, amœbæ, moulds, insects, and even mammals; and they can cause mutation of normal cells into cancer cells. The unusual thing is that the mutant cancer cell is more competent than the ordinary cell—"viciously competent," as Dr. Rhoads puts it. "The cancer cell," he says, "is better able to survive in the environment in which it is born than is its parent strain of normal cells." Some dietary studies complicate the picture further: it has been shown that a dye which caused cancer of the liver in animals will only do so when riboflavine is absent from the diet. Again, a low-calorie diet reduces the incidence of cancer in mice; and this is true however the cancer is produced—whether spontaneously or by chemicals, or by ultraviolet light. The important factor seems to be reduced endocrine activity. Thus it may be (and microscopic studies support the suggestion) that cancer cells are formed and lie dormant for long periods, and they only become active when some change in the chemistry of the body fluids gives them their opportunity. Cancer control, then, might be a matter of preserving some chemical state which restrained the growth of cancer cells; and indeed we have found already that cancer of the prostate and the breast can be irregularly and temporarily controlled by altering the endocrine balance.

Some cancers can be controlled by direct chemical means: Hodgkin's disease, leukæmia, and lymphosarcoma, nowadays regarded as cancers of the blood-forming system, respond to two different groups of compounds—the nitrogen mustards and urethane. Or a radioactive substance may be used to attack the cancer from inside; thus thyroid cancer has been treated with the radioactive isotope of iodine. Dr. Rhoads suggests that we need intensive study of the synthesis and metabolism of steroid hormones resembling those formed by the sex glands and the adrenals; study of chemical agents which are now weakly active in controlling cancer, and an empiric search for new ones; and the pursuit of new isotopes capable of killing cancer cells without forming dangerous concentrations in normal cells. Meanwhile, thanks largely to better and earlier surgical intervention, and advances in radiotherapy, the death-rate for cancer adjusted for the age of the population "is clearly and sharply on the down grade." The whole prospect is much more hopeful than it used to be; pieces of the jig-saw are being collected at a prodigious rate, and one day will inevitably fit together.

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[1] Perspectives in Medicine. Columbia University Press. London: Oxford University Press. 1949. Pp. 163. 14s.

Society of Apothecaries of London

At recent meetings of the court of assistants, over which Prof. E. C. Dodds, F.R.S., the master, presided, Mr. Duncan C. L. Fitzwilliams was elected master from Aug. 24, and Dr. Frank Howitt and Dr. G. Roche Lynch were elected wardens. Dr. J. F. Carter-Braine took his seat on the court of assistants.

The following examiners were sworn in: Mr. Anthony Charles and Mr. Norman White (midwifery); Mr. Paul Haas, D.SC. (chemistry). Dr. Thomas Hunt was appointed examiner for the diploma in industrial health.

R. M. Haines was clothed by the master with the livery. The following were admitted to the freedom of the society by redemption:

F. C. Blaaberg, L. H. Lampitt, Sir Stanford Cade, R. T. Brain, K. J. Franklin, Kenneth Robson, J. C. N. Wakeley, E. R. Boland, H. B. O. Cardew, Sir James Walton, A. J. Walton, E. J. Crisp, A. E. M. Woolf, G. H. Hogben, E. T. D. Fletcher, Edith C. Hudgell, G. R. M. Cordiner, Sir George Aylwen (Lord Mayor), S. W. Davidson, N. R. Barrett, C. B. Perry, W. P. Cleland, J. G. Scadding, A. W. Spence, P. R. Allison.

The following were granted the diploma in industrial health on examination:

J. A. Herd, C. N. D. Cruickshank, C. Crowley, G. G. Mathew, W. G. White.

The diploma of L.M.S.S.A. Lond. was granted on examination to the following:

H. T. H. Beach, J. L. Jarvis, D. Redpath, G. E. Hanks, F. W. Retief, M. P. Cardew, K. C. Horrocks, E. M. Tiger, H. V. White, M. P. M. Coupland, R. J. Aspinall, C. J. G. Menzies, C. R. May, M. C. H. Jackson, H. E. G. Dyer, F. Walton, F. E. Bramwell, E. R. Goodall, D. J. Joubert, G. B. Stephenson, W. G. Burvill Holmes, G. T. Cecil, G. A. R. Giri, P. B. Poole, A. K. Kantarjian, L. Kader, J. D. Morris, C. T. Jones, E. W. Melia, M. C. Gilbert, A. S. Murad.

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Sept. 6, at 4.30 P.M., in the anatomy theatre of Edinburgh University, Prof. D. V. Davies is giving a lecture on Synovial Membrane in Health and Disease.

Scottish Intelligence Survey

Speaking in Oxford at a summer school of the National Union of Teachers, Sir Godfrey Thomson, D.SC., professor of education in the University of Edinburgh, announced that the Nuffield Foundation would finance the first 5 years of the 20-year plan for testing the intelligence of Scottish school-children. The children are to be selected from among those born in 1936 in every type of family.

Royal Photographic Society

The annual exhibition of this society will be held at 16, Princes Gate, London, S.W.7. This year the exhibition is to be divided into two parts. Pictorial, colour, and stereoscopic exhibits will be shown from Sept. 9 to Oct. 2, and scientific, nature, record, and technical exhibits from Oct. 8 to 26.

National Association for the Prevention of Tuberculosis

A joint meeting of the association and the Society of Medical Officers of Health will take place in B.M.A. House, Tavistock Square, London, W.C.1, on Thursday, Sept. 15, at 2.30 P.M., to discuss social and aftercare arrangements by local health authorities under the National Health Service. The following will open the discussion: Sir Allen Daley, Dr. G. W. H. Townsend, Dr. W. Alcock, Dr. Neville Irvine, and Miss Anne Topley.

Preventive Dentistry

The Ministry of Education has set up a Working Party to direct and organise an investigation on the prophylactic effect of the local application of a solution of fluorides to school-children's teeth. The members are: R. Weaver, M.D., F.D.S., Ministry of Education (chairman); E. R. Bransby, PH.D., Miss J. R. Forrest, L.D.S., and W. G. Senior, PH.D., F.D.S., Ministry of Health; G. J. Parfitt, M.R.C.S., L.D.S., department of preventive dentistry, Eastman Clinic; B. R. Townend, F.D.S., West Riding local education authority; W. Ritchie Young, F.D.S., London County Council; and A. T. Wynne, M.D., B.D.S., Ministry of Education (secretary).

King's College Hospital Medical School

Sir Hugh Cairns will deliver the inaugural ad
opening of the 120th session of the medical scho
Hill, London, S.E.5, on Friday, Sept. 30, at 3 P

A Second Pair of Glasses

To relieve the present difficulties in the
the Minister of Health has decided, after consulta
appropriate organisations, to introduce
will enable ophthalmic medical practitioners an
opticians, at their discretion, to postpone orde
pair of glasses which, although necessary for t
of vision, is not urgently required for the
and daily needs.

Churches Council of Healing

The London joint committee of this coun
during the autumn and winter months, two
lectures, one on the devotional side entitled
Wholeness and the other on the medical and
entitled Health and Healing. The lectures will
Friends House, Euston Road, London, N.W.
particulars may be had from Mrs. Michael Thom
Manor, High Wycombe, Bucks.

Medical Defence Union

At the annual meeting of this body on Sept
will consider a recommendation by the co
ordinary annual subscription should be
to £2, except for those joining within three
tion, who for each of the first three years
pay only £1. Since 1947 expenditure has
partly owing to the public's increased litigio
award by the courts of damages on a higher sc
the war.

Dame Dehra Parker, D.B.E., M.P., has b
Northern Ireland minister of health and local
succession to the late Mr. William Grant.

Prof. Alexander Kennedy will leave by ai
on Sept. 11 for a six-week visit arranged
Council. He has been invited by the governm
to advise them on mental health and psychiatr
and the presentation to the Victorian parlia
dealing with this question is being delayed unti

The proceedings of the First Internation
B.C.G., held last year in Paris and Lille, h
published. They are obtainable (price 750
of the congress and 1000 francs for others) from
tation centre of the B.C.G. department, In
25, rue du Dr. Roux, Paris 15°.

Births, Marriages, and De

BIRTHS

CURL.—On Aug. 22, at Norwich, the wife of D
daughter.

HAMILTON.—On Aug. 20, the wife of Dr. J. J. Ham

JOLLES.—On Aug. 23, at Northampton, the wife
Jolles—a son.

KEELE.—On Aug. 16, in London, the wife of Dr
a son.

MCAFEE.—On Aug. 19, at West Kirby, the wife of I
—a daughter.

NABARRO.—On Aug. 26, in London, the wife o
Nabarro—a son.

THOMPSON.—On Aug. 23, at Nairobi, the wife of Dr.
—a daughter.

UNSWORTH.—On Aug. 21, at Bolton, the wife of Dr.
—a son.

MARRIAGES

BOLTON—HALL.—On Aug. 31, at Ashton-under-Lyn
F.R.C.S., to Barbara Hall, M.B.

REDFEARN—SHAFIR.—On Aug. 19, in London,
Thorpe Redfearn, M.D., to Shulamith Shafir.

DEATHS

BLABER.—On Aug. 21, at Twyford, Berks, Percy
M.R.C.S., aged 77.

DUFFY.—On Aug. 23, at Oldham, James Joseph

ENGLISH.—On Aug. 25, at Sudbury, Suffolk, Thom
K.C.M.G., M.B. Lond., F.R.C.S.

FERGUSON.—On Aug. 27, James Ferguson, C.
D.P.H.

SHAVE.—On Aug. 22, Edward Simpson Shave, M.R.

DYSMENORRHŒA *

A. J. WRIGLEY
M.D. Lond., F.R.C.S., F.R.C.O.G.
L PHYSICIAN AND LECTURER ON MIDWIFERY AND
ES OF WOMEN, ST. THOMAS'S HOSPITAL,
LONDON

ORRHŒA seems to be as old as the hills. It ally thought to be due to obstruction and d by abdominal massage and cervical dilatation gies or with pessaries. Soranus (A.D. 98–138) rest, massage, fomentations, compresses, douches, with massage and remedial exercises he menstrual periods. Congestive dysmenor- ears first to have been suggested by Aetius th century, and membranous dysmenorrhœa ribed by Morgagni in 1779. From ancient atively recent times the theses of Hippocrates nus were accepted almost in their entirety; the nineteenth century no writer did much repeat them.

Simpson described an operation for the relief orrhœa in which he cut the wall of the cervix ally with a hysterotome. In 1872 Hegar, nd Battey, in August, each performed a bilateral omy (normal ovaries were removed) to cure rhœa.

edicinal treatment of dysmenorrhœa in the h century included valerian, oxide of zinc, m, prussiate of iron, quinine, ergot, salicylates, of muriate of iron, tincture of guaiacum, s, ammonium bromide, *Veratrum viride*, bella- *Sanguinaria canadensis*, ammonium acetate, m, cerium oxalate, viburnum, and ulakambal. ments tried in recent times are quite as varied. g to the *Quarterly Cumulative Index Medicus* and 1947, these have included acetylcholine, Edrisal,' endometrial extract, resection of the nerves, genital hormones, 'Pavatrine,' l,' phenylpropylethylamine, stem pessary, mones, 'Donnatal,' resection of the superior ric plexus, disinsulised pancreatic extract, rcises, ephedrine, vitamin-B complex, loosening contractures, pregneninolone, and deproteinated ic extract. This second list well illustrates the onfusion in the treatment of dysmenorrhœa.

CLASSIFICATION

(1938) wrote: "... Dysmenorrhœa ... has been ed into primary and secondary, essential and atic, spasmodic and congestive, intrinsic and , ovarian and uterine, obstructive, mechanical, tory, habitual, temporary, neuralgic, accidental, gical, vagotonic, &c." He criticised the terms y" and "secondary," and "intrinsic" and ic," because they imply two types of dysmenor- e in which the fault lies in the uterus, and the which the fault lies outside. The uterus should lamed, for in both types the hypercontraction ordination, which cause spasmodic dysmenor- d the vascular imbalance which is the foundation stive dysmenorrhœa, are secondary to nervous nonal abnormalities. Davis almost absolved us and its possible abnormalities in development, ize, &c., from being directly associated with the ion of pain. Nevertheless, since classification kind was essential, he adopted in this book the natic division of "spasmodic" and "congestive," e pseudopathological one of "primary" and lary."

Blair Bell (1934) had different ideas about the classification of dysmenorrhœa; he wrote:

> "Such classifications as 'spasmodic' and 'congestive' should be cast aside, for they are evasive and futile. The advantages attaching to a pathological classification of disease have never been better shown than in the subject under discussion, wherein a proper pathological knowledge has placed the methods of treatment on a scientific and satisfactory basis."

In spite of this he made the very error he deplored, by dividing his subject into "intrinsic" and "extrinsic."

"SPASMODIC" DYSMENORRHŒA

It may be thought that the spasmodic type of dysmenorrhœa is universally accepted and there can be no possibility of doubt about its existence. Has not the muscular spasm been seen at operation? Has it not been demonstrated radiographically by Schultze and others (cited by Davis 1938; p. 45)? And have not records been made of the variations in uterine pressure which coincide with the contraction and relaxation of the organ? Have not these contractions been demonstrated to be synchronous with the pain?

To these questions I would reply with others. Has the actual spasm been observed at operation? Could not the pale bloodless areas, supposed to be bloodless because the spasm has driven all the blood out of the vessels and the tissues, be due to ischæmia produced by intense vasoconstriction? Do the radiograms of Schultze really demonstrate spasm? What is the effect of the presence of a small hydrostatic bag, acting like a foreign body, within the uterine cavity? Is it certain that by this means an accurate record of the strength and frequency of the muscular contractions is obtained? Is there *no* chance that the presence of the foreign body influences the results obtained? I know that Moir (1934) has shown different readings in patients who have and who do not have spasmodic dysmenorrhœa. But still I wonder.

NERVOUS CONTROL OF UTERUS

When we consider the nerve-supply to the uterus, and the ways in which muscular spasm may be produced, the picture becomes even more confused. In the first place, spontaneous strong rhythmic contractions of the uterus have repeatedly been observed when it is separated from all its nerve-supply. This, however, does not mean that the uterine contractions are not affected by nervous influences. Though many believe that the uterus possesses two sets of autonomic nerves, others are most emphatic that the existence of a parasympathetic supply is far from proved, and insist that this question is still sub judice.

Be that as it may, we must now ask what is the action of the sympathetic nerve-supply on the uterine muscle. Reynolds (1939) cites Cyon, an early worker, as having observed that he failed completely to obtain either motor or inhibitory effects from stimulation of the peripheral ends of the cut sacral nerves—a fact later confirmed by Langley and Anderson (cited by Reynolds 1939; p. 272) and many others. Cyon did note, however, that contraction of the uterus resulted from stimulation of the central end of the cut sacral nerves; this effect had been produced via the pelvic plexus. The only motor response from stimulation of the peripheral ends of the cut sacral nerves was contraction of the rectum and bladder. Section of the presacral nerves, leaving the sacral innervation intact, cut all the sensory pathways from the uterus, and Reynolds concluded that the sensory nerve connexions of the uterus passed to the central nervous system by way of the abdominal sympathetic system.

Hitherto no distinction has been made between the character of the motor responses of the uterus when one

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on a postgraduate lecture given at the Royal College of etricians and Gynæcologists on Nov. 19, 1948.

group of nerves is stimulated, and the response of the myometrium when other components of the uterine innervation are stimulated. So far as we have gone, the only assumption that we could make is that the whole uterus contracts when any of the nerve groups supplying it is stimulated. For many years, however, it has been suggested that different effects could be obtained in different parts of the uterus by stimulation of this, or that, group of uterine nerves. Nearly 100 years ago it was suggested that stimulation of the nervus erigens caused contraction of the longitudinal fibres of the body of the uterus, and at the same time by inhibition caused relaxation of the cervix, whereas stimulation of the presacral sympathetic nerves produced exactly the opposite results. Salgannik (1935) suggests that the body of the uterus is innervated mainly through the hypogastric nerves, and the cervix through the sympathetic. Several workers failed to obtain any muscular response from stimulation of the peripheral ends of the cut sacral nerves, and in Reynolds's (1939) own words: "Hypotheses which are based upon the assumption that the uterine musculature is innervated by the sacral autonomics are without merit, so far as our present understanding of the innervation of the uterus is concerned."

To add to our confusion, it appears that different motor responses may be expected according to the level in the sympathetic chain at which this stimulation occurs, and that all effects of stimulation, however and wherever brought about, may be entirely different in the non-pregnant uterus and in the pregnant uterus.

This brief and confusing review of the neuromuscular relationship of the pelvic nerves and uterine muscle has not been produced in any spirit of criticism of those many workers who have spent an enormous amount of time and painstaking labour in attempting to solve an obviously extremely difficult problem. We have seen that the uterus can contract, so to speak, on its own; that there are described two sets of nerves, sympathetic and parasympathetic, and that the existence of the latter is disputed; that opinion is by no means unanimous about the response to stimulation of the peripheral or of the central ends of cut nerves; and that any apparent constancy in any response may be dispersed if the nerve is stimulated at different levels, and altered completely according to whether the uterus is, or is not, pregnant. My only conclusion—and this I emphasise is the opinion of an onlooker—is that I am quite unable to accept, in the light of present knowledge, any relatively simple explanation of the causes, routes, means, call it what you will, of uterine contractions, spasms, colics, or relaxations; nor am I at all convinced of the production of uterine pain by spasm.

Pain

The problem is not tied up only with a nerve stimulus and its hypothetical response. Leriche (1937) and many others have told us that other *and very important* factors must also be considered. We are dealing with living people and must take into account the variable reaction to pain exhibited by different people, and the state of mental or physical health of the person at the time.

We are only beginning to study and to understand what may be called the physiology of pain. The further our researches extend into this subject the greater appear the fallacies of preconceived ideas. The part played by vasoconstriction and vasodilatation in the production and relief of pain is assuming an ever-increasing importance. For instance, any alteration in the condition of the peripheral circulation by means of excision of the perivascular nervous plexus, or by its infiltration with procaine, can be made to abolish the pain in a limb, the distribution of which pain appeared typical of some particular sensory nerve. I am sure we will hear much
more about the association between vasoconstri
dysmenorrhœa in the near future.

Endocrine Glands

Recently pointers have been given to the par
in the production and diminution of pain by the
glands, especially the suprarenal glands and th
in the constriction and dilatation of blood-v
at the same time the possible influence of th
chemistry, as suggested by the painful contrac
associate with a diminished blood-calcium conten

CONGESTIVE DYSMENORRHŒA

Congestive dysmenorrhœa is now divided into
and secondary. The primary type presumes a
primary congestion. I do not believe that th
or that it is a possible cause of the pain.
describe the condition say that it is charact
severe pain felt during the first two or three
menstruation, and at the same time the amount
ing is usually greater than the normal.
statements taken together do not, and never w
sense; for, if there is congestion it will be
by bleeding, which immediately relieves tensio

RELATION OF DYSMENORRHŒA TO TOTAL CONDITION

Let us recall an easily overlooked fact.
must still embrace the whole subject; the
tendency to specialisation the more likely is t
forgotten. Thus, the very fact that all teachin
possess, in addition to many other special dep
a department of gynæcology inevitably influe
students, and (I am sorry to say) many of their
also, to look first, or perhaps only, to the pelv
for the explanation of any or all of the sympt
appear to originate from some disorder of the
of the ovaries.

My teaching on any disorder of menstruation
amenorrhœa, scanty menstruation, menorr
dysmenorrhœa, is that questions must be ask
search made to find out whether the symptom
likely to result from some general medical
rather than some intrapelvic abnormality. Th
association between amenorrhœa and such c
as diabetes, hyperthyroidism, an acute febri
an operation, mental shock, and a complete c
mode of life is known to all of us; but it is of
looked. Likewise, we all have seen menorr
metrorrhagia accompany such diseases as t
anæmias, thrombocytopenic purpura, and seve
tension. We may have been surprised and gra
the rapidity with which the symptom disappea
a patient has taken our advice that to look afte
and family and to follow an arduous employ
beyond her strength and that her outside wo
be discontinued, at least for a time. How eas
ignore the patient's medical and social bac
and to search for and find a hypothetical disord
position, size, or shape of the uterus! If this sor
can happen with concrete symptoms, such as
rhœa and menorrhagia, I am sure the temp
look to the uterus or its nerve-supply for the
the less definite symptom of dysmenorrhœa i
great or even greater.

ABNORMAL TISSUE

Pelvic Endometriosis.—Dysmenorrhœa does ac
endometriosis, a condition which, though un
is not very rare. There is a definite age-incide
the pain, which may be noted for a few days b
onset of menstruation, reaches its maximum d
first three days of the period. Abnormal physi
are found on examination.

Uterine Fibroids.—In a similar manner dysme
may be found in association with a uterine fib

PELVIC INFLAMMATION

congestive dysmenorrhœa accompanies any r subacute inflammation in the pelvis. Again of affairs is uncommon but certainly not rare o be overlooked. The pain at the time of ds may be the dominant symptom about which nt seeks advice. It too bears a definite ip to the period. Usually starting some days e period is due, it reaches a maximum just e onset of the period and is often relieved by the menstruation. It is as if a state of tension is by the addition of the premenstrual and ical hyperæmia and relieved by the loss of blood. in is something definite in the history, and physical signs should be apparent on ion.

ENDOCRINE IMBALANCE

w leave the certain known demonstrable causes to consider the probable but slightly less definite rate to the student and perhaps to the teacher ditions that appear to be closely associated with rrhœa.

sia or Imperfect Maturity of the Uterus

must only be diagnosed on definite evidence from the history, symptoms, *and* physical d not from the history, symptoms, *or* physical We are not justified in diagnosing hypoplasia history alone, or on some possible and usually isputable physical abnormality. The dysmenorust have existed from the *onset of menstruation*; t is usually at a later age than usual; and the between the periods is rather longer than normal ot constant. Menstrual loss tends to be scanty ompanied by a variable amount of pain. The may be of normal intelligence and mental standard normal, or definitely subnormal. Physically, eral development, especially of all secondary racteristics, is incomplete; if this is not so, e no right to make the diagnosis and no basis for the appropriate treatment. Breast developpoor, and hair distribution incomplete. Rectal ation, or vaginal examination under anæsthesia, how that the uterus is definitely not fully ed.

Bell (1934) and many others emphasise the tion between the imperfectly developed uterus smenorrhœa, but they did not (or do not) draw n to the fact that the small uterus is only one station of a much more important general state mplete maturity. It may be that the imperfectly ed uterus has a shorter cavity than is normal, acute flexion is a sign of imperfect development, s far wiser not to direct the attention of the patient, e student, to these local and relatively unimportant rities, but rather to emphasise the more definite clinical picture.

e condition that has been described is thought resent, some benefit to the patient and consequent from her symptoms may be expected from the istration of œstrogens. Thus, a fairly large dose—ilbœstrol 1 mg.—should be ordered and the patient ted to take one tablet twice a day from about the o the 27th day of the cycle for about three months. treatment is going to help, the success will soon parent, and for the second three months the dose e halved, and thereafter treatment discontinued. gens are not given in the first half of the cycle se cases, owing to the risk of their suppressing tion, an event not to be desired in a young and tially healthy girl. An initial freedom from pain first few months of menstruation in these cases een thought to be due to the fact that ovulation is absent to begin with, but this suggestion is entirely hypothetical.

Membranous Dysmenorrhœa.—The second type of dysmenorrhœa that may with reasonable certainty be associated with dysfunction and imbalance of the secretions of the endocrine glands is membranous dysmenorrhœa. Morgagni (cited by Davis 1938; p. 128) described this nearly two hundred years ago, and Beckwith Whitehouse (1926) drew our attention to its importance and nature in many papers and in his book on gynæcology. The patient is usually a healthy active girl or woman whose early years of menstruation were usually free from pain. For no known reason severe and intermittent or persistent dysmenorrhœa develops, colicky pain being felt on menstruation. Occasionally the patient may associate the most severe pain with the expulsion of clots or lumps.

Whitehouse showed that, whereas the expulsion of a complete endometrial cast of the uterus was rare (the presence of this cast was previously necessary for the original diagnosis of membranous dysmenorrhœa), the endometrium was expelled much more often in several large pieces of tissue. This tissue examined microscopically, showed definite pathological changes: the endometrial membrane was much thicker than normal, and the increase in thickness was due to a considerable overgrowth of the compact layer, the so-called premenstrual decidua. The growth of this tissue is under the control of the corpus luteum, and this association had been observed at operation for some years before its exact nature was understood.

Ordinary antispasmodic drugs, or simple cervical dilatation and endometrial curettage, had been of little help to these patients, who often were treated by hysterectomy or later by X-ray sterilisation. In the knowledge that œstrogens lessen the activity of the anterior part of the pituitary gland and by this means may decrease the production of luteinising prolan, the suggested treatment is again œstrogen therapy. The dosage is, as before, on the large side, but the time of administration in the cycle is slightly different, in that treatment should start rather earlier in the cycle, about 9 or 10 days after the onset of menstruation, and should continue until the 26th or 27th day.

I believe that a large, even a very large, number of patients should have come under this category who have been erroneously diagnosed and treated as cases of spasmodic dysmenorrhœa. The menstrual loss may be assessed as normal or may be obviously excessive; it is never scanty. Whitehouse likened this condition and its symptoms to a pseudo-abortion, and his comparison is probably accurate. But, having reached this satisfactory state of affairs as regards our accepted pathology of this type of dysmenorrhœa, we must remember that it is certainly possible for a patient to pass an endometrial cast, abort an ovum, or even give birth to a full-sized baby at term without experiencing any pain whatever; but such events are rare.

Other Conditions of Endocrine Imbalance

As regards the other endocrine glands of the body, all have been in their turn singly or severally blamed for their part in the production of dysmenorrhœa. Thus, the pars anterior in the pituitary gland in its control of the ovarian cycle has been an obvious target for attention, as also has the posterior part concerned with the production of pituitrin, whose oxytocic properties provide an easy explanation for spasm. The enlargement of the thyroid gland in the few days before menstruation has suggested a possible relationship to dysmenorrhœa. The production of muscular spasm, following a lowered blood-calcium level, immediately suggested a reason for implicating the parathyroid glands. Even the thymus gland (cf., the use of 'Thymophysin') was thought to have a tonic effect on the uterine muscle. All these glands have had their day, and doubtless that day will return again and again as the years roll by, but I am pretty certain that it is unlikely that any one of them will be found to be responsible for dysmenorrhœa.

PSYCHOGENIC FACTORS

Davis (1938) devoted only three pages in his book to the emotional aspect, and as few lines are allotted to it in some modern textbooks on gynæcology. It is generally agreed that the psychogenic factors must be considered, but there is no general agreement about their importance. I suggest that at present an entirely insufficient consideration is given to this aspect of dysmenorrhœa by most doctors, whether they be in general or specialist practice; and the specialist seems to be the greater sinner. All of us must have seen cases where the psychogenic factor was the obvious cause of the dysmenorrhœa—e.g., the patient who is married and anxious because no pregnancy follows normal married life. The folly of a failure to recognise the true state of affairs, and in consequence the treatment of the wrong condition, needs no emphasis.

In every case of dysmenorrhœa a careful inquiry on common-sense lines into the social, domestic, economic, occupational, and habitual background should be made, and in my experience this often, and without any special training in the higher arts of psychology, brings to light some circumstance of importance. I think it nothing short of a tragedy that the teacher should try to fit each case of dysmenorrhœa into the pigeon-holes labelled spasmodic, congestive, and membranous, and I use none of these three labels. There is no need to accept the Freudian outlook, which would regard each case of dysmenorrhœa as the expression of some repressed sexual instinct, but a proper appreciation of the neuropsychic factor is essential to the proper understanding and management of dysmenorrhœa.

Maleducation

Occasionally we meet the case of a girl whose dysmenorrhœa seems to be the result of what can only be termed maleducation. She is, in my experience, always an only child and always accompanied by her mother, who has also had dysmenorrhœa. From the onset of menstruation the menstrual period has been given undue importance. The girl has stayed away from school, and may even have been kept in bed for a short time. I believe that these patients consciously, or subconsciously, welcome this relief from the daily round and are genuinely resentful of any alteration of the routine. Any suggestion that less attention be paid is certainly not at all welcome, and the management has to be most carefully undertaken. The mother needs quite as much handling as the daughter, and all sorts of legitimate subterfuges can be used.

Debility

Lastly, the discomfort of menstruation can easily be turned into a severe pain in any patient who is suffering from true debility, whether this be the result of illness, overwork, or worry. The treatment here is the treatment of the cause, and again I emphasise the fatuity of any treatment of the pelvis, or in fact of any treatment whatever, that ignores the cause. And yet how often this happens; indeed we may ask how often we ourselves have done this.

I have not mentioned the pin-hole os, the uterus with a kink, congenital retroversion of the uterus, sclerocystic ovaries, and many other possible and impossible abnormalities.

TREATMENT

The subject of dysmenorrhœa, and therefore the patient who complains of this symptom, should be approached with the knowledge that we are almost always dealing with a *symptom* and not with a that we should *pay far more attention* to the background, and that we should make a *examination as well* as a pelvic examination.

Antispasmodics.—The treatment of obvious dysmenorrhœa is obvious; we must treat th which is often missed altogether. The is that of the young woman who is apparently in physical health, mentally sound, and prostrat month with "spasmodic" dysmenorrhœa. I already stated that I am perfectly certain th diagnosis is made far too often and too readily. however, even I am forced to make it, how do I treat the condition? Usually the patient has tried, and failed, to get relief by the use of th spasmodic drugs, such as aspirin, 'Veganin,' &c.; but that does not mean that she should them altogether.

Attention to Bowels.—It is useless to treat rhœa in the presence of chronic constipation; treatment of constipation does not consist in the of this, that, or the other purge, aperient, or Often the pain at menstruation has gradually as the bowel action slowly returns to normal.

Physiotherapy.—The next line of attack is to aid of the physiotherapist; by this I mean patient is instructed in remedial exercises and is vised regularly in their performance. Davis dismissed the successes claimed by such adv this method of treatment as Ewing, Bell, and Par stating that they probably erred on the side of and that the great majority of cases treated relatively slight. This may or may not be true—no uncritical assessor of physiotherapy—but I hav and I continue to see, really severe cases of " dysmenorrhœa relieved completely of pain by of treatment. I would use the word "cured," dare not do so. Occasionally this method fails, now only a few cases remain and they are treat cervical dilatation.

Cervical Dilatation.—Twenty years ago over dilatation operations were performed each ye St. Thomas's Hospital for "spasmodic" dy In the last ten years, not 10 cases have been so in any one year, and in 1946 only 3. This may be to a fall in the number of cases presenting them at hospital, the success of other methods of inv tion and treatment, or the fact that our the subject has become unpopular or out of date, the result that the patients have gone, or have sent, elsewhere. I am sure we may dismiss the and I suggest that the second suggestion is probab most important.

Presacral Sympathectomy.—As a team, we have formed a presacral sympathectomy but five time this is only because we have not had any nece consider its more frequent performance.

Other Treatments.—In the treatment I have outl I have not mentioned such methods as helioth diathermy, ionisation, protein shock, vitamins, and m psychotherapy, radiotherapy, or hysterectomy.

DISCUSSION

Some writers on the subject believe that the expl tion of dysmenorrhœa is most likely to be found in orders of the endocrine glands. One probable ex of this is that overgrowth of the corpus luteum pro too great a quantity of progesterone, which leads endometrial membrane possessing a thick compact l of decidual-like tissue, the expulsion of which in p or in toto, may be accompanied by colicky pa contractions of the uterus. Another probable ex is dysmenorrhœa associated with imperfect develop-ient and of her uterus, and apparently relieved gen therapy.

lleged examples are far more difficult to accept. ıce, on the assumption that œstrogens sensitise e muscle to the action of the oxytocic principle sterior part of the pituitary gland, and that one has the opposite effect, it has been suggested es that too much œstrogen in circulation causes rhœa. It has often been noted, however, that ›pathia hæmorrhagica, where there is an d overproduction of the follicular hormone, ıotoriously absent, even though strong con- of uterine muscle may be observed during sion of the blood-clots. Progesterone therapy elief of dysmenorrhœa has often been advised l, and the results, on the whole, have been ting.

ssible relationship between other ductless glands ful uterine contractions is based on so flimsy ion as not to deserve serious consideration.

we come to associate endocrine dysfunction listurbance of the innervation of the uterus, into very deep waters. The large ganglion the paracervical ganglion of Frankenhäuser e after removal of the ovaries and regenerate rogen therapy. This phenomenon may reconcile nologists and the endocrinologists.

is undoubtedly some truth in all these theories estions; but when the few certain causes of l pain, such as inflammation, can be excluded, no generally acceptable explanation for the g cases. If we agree on this point, we shall be e to make serious mistakes by labelling these either "spasmodic" or "congestive." If is we, our pupils, and our patients will receive her stimulus to concentrate on the pelvic organs ost likely site of the cause. With every succeed- there will be less and less likelihood that the as an individual human being, will be considered ored with a view to finding some physical and/or d (I put them in this order lest I be thought biased, but I believe they should be the other nd) abnormality or upset that may have some perhaps a most important one, on the symptom. let me earnestly plead that this general examina- ould always be performed carefully and not orily before attention is directed to the pelvis. e a pelvic examination is necessary—even when ve we have discovered some abnormality in the which seems to be the probable, or perhaps cause of the pain.

eve my teachers, even though they were ignorant scoveries made in the last twenty to thirty years, y generation a more sensible and wholesome n and outlook on dysmenorrhœa than is given teachers today. Meigs and Sturgis (1947) devote 3 pages on the treatment of dysmenorrhœa to l sympathectomy. What impression can be when this article is read by the practitioner or ? There is only one possible answer, and that the treatment of dysmenorrhœa is presacral ıectomy, and this is becoming the usual answer mination candidates. Indeed this presacral ıectomy seems to be the sole treatment adopted American clinics, and seems likely to become er home before long. If this happens we shall g backwards—not forwards. Let us rather, as Bell exhorted his readers, "temper surgical with physiologic mercy."

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Continued at foot of next column

MERCURY POISONING FROM FINGERPRINT PHOTOGRAPHY

An Occupational Hazard of Policemen

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IMPRESSIONS of fingers have been found on relics from ancient civilisations, but there is no reliable evidence that they were used for identification. Purkinje (1823) was the first to classify fingerprints, but no immediate use was made of his ideas. In 1880 Sir William Herschel described how, as an administrator in the Hooghli district of Bengal, he had been using fingerprints for about twenty years as a safeguard against impersonation and repudiation of signatures. Nevertheless, it was Faulds (1880) who first suggested that fingerprints might be used for personal identification, particularly of criminals. In the next decade both Faulds (1894) and Sir Francis Galton (1892) separately evolved systems of classification. Then Sir Edward Henry, formerly of the Bengal Police, adopted Galton's classification and began systematic detection by fingerprints; in 1901 he set up the finger-print bureau at New Scotland Yard.

METHODS OF DEVELOPING LATENT FINGERPRINTS

Police methods of recording and comparing fingerprints have not greatly changed since they were first used. Prints are still taken from the fingers of suspects by covering them with printer's black ink and pressing or rolling them on cards. Dark coloured powders have occasionally been used. The process in either case is simple and without risk. Detection by fingerprints depends on the comparison of such inked impressions with latent fingerprints left on furniture, doors, or movable objects at the scene of a crime. Such prints, left by the film of sweat and grease on the finger-tips, have often to be developed and photographed for greater ease of comparison and recording. Developing is done by applying a finely divided powder—a light-coloured powder on a dark background, or a dark powder on a light background—with a soft flat squirrel-hair or camel-hair brush, and the excess is brushed or blown off. Insufflators have been used, but with less success. The powders used in the past have included aluminium, willow charcoal, acacia black, lampblack, powdered graphite, and white lead. The last named was the cause of a case of chronic lead poisoning reported by Nyfeldt (1937).

This man had worked for the police in Denmark for twenty-six years developing fingerprints. He was thought to have inhaled the white-lead powder. Six years after starting to use it he developed colic and neuritis. Twenty years later, while still using it, he suffered from arthralgia and swelling of one knee, and punctate basophilia was found in his blood.

The powder most commonly used in British and United States police forces is mercury-with-chalk or grey powder (hydrargyrum cum creta *B.P.*), prepared in the usual way by triturating one part by weight of metallic mercury with two parts of chalk in a mortar. This powder seems to have a particular affinity for the sweat-formed latent prints, and produces a good image for photographing.

MR. WRIGLEY: REFERENCES—*continued*

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A competent police authority estimates that 90% of all developing of latent prints in Great Britain is now done with this powder.

Police forces in this country do not all place the same reliance on detection by fingerprints. In most forces detectives are required to undertake fingerprint work as a minor part of their duties. The Lancashire Constabulary, however, sets particular value on such techniques, and employs a body of men who are specially trained for fingerprint duties. They are members of the criminal investigation department who also perform ordinary detective duties.

The men with special training consist of a detective chief inspector and some 32 detective sergeants and constables. At their headquarters some men search files of prints, while others develop and photograph latent prints on small objects brought in. The remainder of the men are stationed at scattered points throughout the county and are called in to take fingerprints at scenes of crime. With such specialisation it is inevitable that these men should be working with grey powder for long periods —certainly for several hours each week—since all breaking-in offences in the area are investigated in this way as a matter of policy.

The powder is dry and finely divided. It is applied liberally from a well-loaded brush. The brush itself is often cleaned by rubbing against a convenient door-post, and powder rises in a cloud. At the end of the operation excess powder may be left lying about in the room while investigations are going on. Some detective sergeants and constables wear gloves at work, but none wear dust-masks. Grey powder has been used in this way in the Lancashire Constabulary since 1936. Recent consumption of it there had been at the rate of 5 lb. a month, and the risk of chronic mercury poisoning could not be ignored.

MERCURY AS OCCUPATIONAL HAZARD

Poisoning by metallic mercury probably dates from its first use as a therapeutic substance over two thousand years ago (Almkvist 1929). It has been known as an occupational hazard since Roman times, when quicksilver was mined in Spain. Mercury amalgams were used in refining precious metals and in fire-gilding in the Middle Ages, and their use gave rise to tremors. In the nineteenth century there were serious outbreaks of mercurialism in makers of mirrors and among workers in the felt-hat industry (Hamilton 1925), where the condition is known as "hatters' shakes." More recently the disease has been studied in the hatters and hatters' furriers trades by Hamilton (1921) and Neal et al. (1941), and among thermometer makers and chemical workers by Buckell et al. (1946). Other trades in which there is a risk of mercurialism are the recovering of the metal from ore, the manufacture and servicing of electric meters, the making of surgical dressings containing mercury salts, the bronzing of field-glasses, photo-engraving, the making and use of laboratory apparatus, and the preparation of pharmaceutical products containing mercury.

SYMPTOMS OF MERCURY POISONING

Stomatitis.—The foremost symptom in the early outbreaks was stomatitis, with retracted spongy bleeding gums, loosening of the teeth, fœtor oris, and salivation. This last symptom gave rise to the name of "salivation cures" for the energetic mercury inunction practised by Sydenham and later by John Hunter (Almkvist 1929). Hamilton (1921-22) and others suggest, however, that salivation is seldom found, at least among hatters with chronic mercurialism. Tylecote (1912) held that the most obvious signs of mercury poisoning were to be found in the mouth, but recently more emphasis has been put on the characteristic tremor.

Tremor.—This is of a coarse intention type, the whole of one or both hands or arms, and se involving the lips, tongue, eyelids, lower lim muscles elsewhere. In severe cases it may af gait, speech, and handwriting. It is easily dis able from the fine tremor of thyrotoxicosis characteristic movements of parkinsonism.

Erethism.—The third principal manifestation psychological disturbance known as erethism. (1929) attributes the first use of this term to John P of London (1758–1826). In this condition the becomes diffident, timid, and easily embarrassed blushes easily; he may become short-tempered and to being watched. More serious mental distu used to be seen in severe chronic mercury intox

Albuminuria has been mentioned by some but denied by others. A specific blood [illegible] thought by some to occur, but Brigatti and Bald deny that there is a specific anæmia attrib mercury poisoning.

CLINICAL INVESTIGATION

When the possibility of mercurialism arising fingerprint work in the Lancashire Constabulary recognised, the officer in charge of the men and 31 the 32 members of his staff volunteered for Mercury excretions were determined by analysing 2 specimens of urine.

A record had been kept of the *number* of investigated by each man *in the past* few year since the developing of latent fingerprints tak average 1–1½ hours per crime, some estimate degree of exposure can be attempted. In practice must vary greatly with the circumstances of each Each man kept an accurate record of his exposure the fortnight preceding the examination.

Of the 32 men, 7 exhibited tremor, with or w other evidence of mercurialism. This tremor, was coarse and distinctive though usually not severe, affected the hands in every case. In 3 ca affected also the lips and tongue, *and in* 3 the ey One man had so severe a tremor that he could n a full cup to his lips without spilling it. His hist as follows:

A detective sergeant, aged 45, had joined the police age of 21 and spent the first eleven years of his serv foot-patrol duties. In 1936 he was trained at the fing department, and, after a few months, he was sent to division where he had to investigate *about* 300 crimes for three years. During this time he became "a wreck" and gave up smoking to try to cure himself, w success. He was then *unable to hold* a glass of water wi spilling it, and even his ten-year-old child remarked o tremor. Before long he found that giving evidence in was "becoming *a nightmare*"; he could not stand answer questions without embarrassment.

During the early years of the war crime diminished division, and his *symptoms seemed to become* less pronou In 1946 *and* 1947 they became worse *again,* reflecting a descence of breaking-in offences, but they were *not* so ba in 1936–39. Of late his exposure *and* his symptoms lessened, because more men *had been able to* help him various times his gums had been very tender, but they s bled. He did not complain of excessive salivation.

On examination five of his teeth were loose, and present in his hands, tongue, eyelids, and rectus abdom muscles. The tremor was coarse and irregular, being of in tion type. His *speech* sounded tremulous and som halting. His gait was normal, but his handwriting was sl irregular compared with a specimen of *seventeen* years be and writing required *great* concentration. His mental appeared *normal*. The tendon-reflexes were brisk.

The history of this case is remarkable in that severity of the man's symptoms had a direct relation to the intensity of his exposure, even *though* at interview he did not attribute the symptoms to his

-URIALISM IN DEVELOPERS OF FINGERPRINTS

l	Evidence of mercurialism		Estimated exposure (hr.)		Urine	
	Tremor	Erethism (past or present)	Preceding year	Preceding 2 weeks	Vol. of 24-hr. specimen (ml.)	Mercury (µg. per 24 hr.)
	—	—	150	15	1040	300
	—	—	60	7	1500	51
	—	—	300	7	2230	44
s.	—	—	100	6	1760	54
T.	—	—	100	10	1695	44
	—	—	20	3	1360	45
	—	—	190	20	1500	28
	—	—	150	20	840	26
T.	—	—	400	28	1940	106
T.	—	—	200	8	1880	101
	—	—	300	7	2100	109
	—	—	15	0	1240	42
	—	—	1000	40	1780	89
	—	—	15	0	2030	81
	—	—	15	0	3720	89
	—	—	30	$^1/_4$	1900	114
	—	—	30	0	2340	65
	—	—	1000	48	3420	65
	+	?	250	$7^1/_2$	1200	96
	+	—	250	9	1400	31
	+ –	+	250	6	510	33
	+	—	159	6	2040	16
	—	—	35	$^1/_2$	2060	35
	—	—	100	7	2180	456
s.	—	—	40	0	..	..
	—	—	30	0	1540	15
	+++	+++	300	0	1110	35
	++	++	300	0	2260	143
	—	—	216	12	2040	79
	—	—	60	$7^1/_2$	1770	113
	– +	+	428	0	1510	75
	—	—	90	$7^1/_2$	1120	36

tremor had been at its worst he had been te drinker of beer, but now he took less and r for it. His embarrassment in the courts indicates mercurial erethism, and the periodic s of the gums can also be considered a specific

the other 6 positive cases there was evidence r present erethism. One constable volunteered was "getting hypersensitive," had profuse at the slightest mental stress, blushed easily, becoming short-tempered with children; he erately severe tremor of hands and eyelids. lushed easily, was embarrassed when questioned, remor of hands, lips, and tongue. In the other symptoms and signs were milder, but could ess be attributed to mercurialism. All the nen drank beer from time to time.

aminations revealed no evidence of bleeding stomatitis. One man with tremor had loose d others too had noted loosening of teeth from me. In one case every tooth in the man's mouth , but this was not considered sufficient evidence rialism, since he had no tremor or signs of As a group these men were intelligent and istomed to have their teeth attended to.

EXPOSURE TO RISK

affected men had all had protracted exposure owder: 2 had been exposed for thirteen years, lve years, 1 for seven, 2 for five, and 1 for four n the last 3 cases the exposures were 250, 250, hours per year regularly. In the remainder s had been more variable but had often reached . Thus in the preceding year, for which accurate s were available, one man was exposed for 160 t all the rest were exposed for 250–460 hours. trast there was another group of men each with iated exposure of less than 100 hours a year. these were employed searching the files at head- , but they were also on a roster to investigate nes of crime. None of them showed any sign of lism.

Eleven men had recently been exposed to risk at the average rate of 250 hours or more per year. It is significant that this group included all the 7 men with mercurialism, and of the other 4, 1 had been at work like this for only eight months. Two men were exposed regularly for $3^1/_2$–4 hours a day while powdering and photographing small articles in the headquarters photographic room. In spite, therefore, of exposures of some 1000 hours per year, neither man was affected. The amount of time they spent in powdering was small; their work appeared to be more circumscribed, and they may have been applying powder less liberally than did their colleagues elsewhere in the county.

URINARY MERCURY ESTIMATIONS

Twenty-four hour specimens of urine collected with scrupulous attention to cleanliness were estimated by a modification of the dithizone extraction technique (Milton and Hoskins 1947). The excretion of mercury varied widely from case to case, lying between 15 and 456 µg. per 24 hours, with a mean of 84·5 µg. In a group of 14 normal persons previously investigated (Buckell et al. 1946) the mean was 31·5 µg., with limits of 5–90 µg. The accompanying table shows that excretions in the present group bear no apparent relation to the declared exposures to risk measured as hours of work, whether recent (in the fortnight before the investigation) or more remote (in the preceding year).

Five of the men with clinical mercurialism had excretions below the general average; the most obvious case of all had a low excretion. The 2 men whose excretions were highest were normal on examination. It is true that they had both been at risk intermittently for twelve years or more, but 2 others exposed for the same time had low excretions.

Note was taken of the amalgam fillings in the teeth of these men, but no relation could be demonstrated between the number of fillings and the excretion of mercury. None of the teeth had been filled recently. Storlazzi and Elkins (1941) found that the mercury in urine almost disappeared by a week after dental fillings had been done. None of the urine specimens contained albumin.

DISCUSSION

The abnormalities discovered among this group of policemen must be attributed to chronic mercury poisoning. Thus an occupational disease of great antiquity appears in a new form, for we can find no published reference to a similar outbreak. Fortunately most of the cases were mild. If there was a danger of chronic mercurialism in the developing of latent fingerprints by this method, it is reasonable that evidence of abnormality should have appeared, as it has done, in members of this particular bureau, for it is unlikely that exposure like this would be encountered in many other police forces in Great Britain. Nevertheless, from time to time a great many men engaged on such duty must be at risk to a lesser degree, and the possibility of unusual individual susceptibility, so often met with in toxicology, must not be overlooked.

The officer in charge of the bureau told us of incidents which suggested that earlier cases may have gone unnoticed. In particular, there had been a colleague of somewhat eccentric habits who could not tolerate being watched at work. This was remarked on long before the possibility of mercurialism had been suggested. In retrospect the story of this man unmistakably suggested erethism.

It is difficult accurately to define these exposures to mercury-with-chalk powder. But, when careful estimates are made in terms of average number of hours per year, it seems that exposures of 250 hours or more constitute a real risk. In one case the recent exposure had been much below this figure.

In individual cases the amount of mercury excreted in the urine is clearly not a reliable guide either to the degree of exposure or to the presence of overt mercurialism. This is agreed by other workers (Neal et al. 1941, Smith and Moskowitz 1948). Nevertheless, the average excretion of members of this group was nearly three times the normal average, and 9 men had excretions above the highest figure in the control series cited above. The high average figure for the group at least bears out the clinical finding of mercurialism among some of its members.

The route of absorption is probably by inhalation of fine dust, but it is possible that some mercury vapour can be inhaled from the powder left lying about. The men's hands are covered in powder while they are working, and direct absorption through the skin or transference of powder by mistake to the mouth might also occur. The men all try to wash after working with powder but cannot always do so.

PREVENTION

Masks and gloves are not a practical solution to this problem. It seems best that the use of grey powder for developing latent fingerprints should be abandoned, provided that a good substitute can be found. At the time of this investigation Detective Chief Inspector Campbell, the officer in charge, was already experimenting to find an even more efficient powder than mercury-with-chalk. He has evolved one which is technically an improvement, since it will fluoresce more brightly in ultraviolet rays, and contains no mercury. The Chief Constable decided to make a change forthwith, and, from the day after this investigation, forbade the use of grey powder throughout the area. It is suggested that other police forces should follow this example.

SUMMARY

The standard method of developing latent fingerprints with mercury-with-chalk powder is described.

Out of 32 men engaged regularly on such work, 7 were found to have evidence of chronic mercurialism.

This appears to be a new form of a long-established occupational hazard.

Exposures in excess of 250 hours per year are considered to constitute a definite risk.

Urinary mercury estimations were of no assistance in diagnosing individual cases or estimating exposures, but the average excretion of the group was abnormally high.

We are most grateful to Sir Archibald Hordern, C.B.E., Chief Constable of Lancashire, for permission to conduct the examinations, for his lively interest, and for the prompt action which was taken when the hazard was shown to exist. On the suggestion of Mr. J. N. Aldington, PH.D., of Preston, Detective Chief Inspector Campbell, of the Lancashire Constabulary, brought this matter to our attention, and we wish to thank him for his kindness, enthusiasm, and invaluable help, and members of his staff for their cooperation. We wish to thank Dr. Donald Hunter, Director of the Department, for his help and encouragement, and Miss S. Pratt and Miss G. de Gabriele for technical assistance.

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VITAMIN B_{12} BY MOUTH IN PE AND NUTRITIONAL MACROCYTIC A AND SPRUE*

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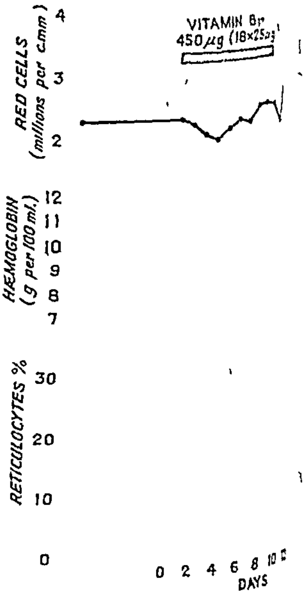
IN the last few years great progress has in the understanding of chemical compounds promote blood regeneration in pernicious Three distinct chemical substances have been shown to be effective—folic acid or ptero acid (Spies 1947); thymine or 5-methyl ura et al. 1946); and vitamin B_{12} (West 1948, S 1948). The chemical structures of folic thymine are known, but the complete st vitamin B_{12} is still unknown. Vitamin B_{12}, adequate amounts, protects the nervous system of persons with pernicious anæmia, which neither folic acid nor thymine does. The excessive amount of thymine required—about 15 g. daily—makes it impractical as a therapeutic agent, and it will not be discussed further here. Folic acid, though not a complete treatment for pernicious anæmia, is especially useful in nutritional macrocytic anæmia and sprue.

Recently vitamin B_{12} has been isolated from liver extract (Rickes et al. 1948a) and from streptomycin residues (Rickes et al. 1948b) and has been show



Hæmopoietic response of case 1 (macrocytic anæmia) to vitamin B mouth. A similar response, in relapse in this case, followed intramuscular injection of 75 µg of B_{12}. This was the most dramatic seen in this study.

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weight, the most potent anti-anæmic substance
Spies, Suarez, et al. 1949). Given paren-
promotes prompt regeneration of blood in
ith pernicious anæmia, nutritional macrocytic
and sprue. The effect of giving vitamin B_{12}
to persons with these three types of anæmia
tudied intensively in our clinic, and the results
e reported below. Investigators have wondered
patients with nutritional macrocytic anæmia
would respond better to small amounts given
than would patients with pernicious anæmia.
xperience this has not been true (Suarez and
8, Spies, Garcia Lopez, et al. 1949).

METHOD

patient used in testing vitamin B_{12} was an adult
infections and severe complications of any
rsons who gave histories of being difficult to
re likewise not selected. The following four
were satisfied in each instance: macrocytic
omic anæmia; a red-cell count of 3,000,000
er c.mm.; a colour-index of 1 or more; and
astic arrest of the sternal bone-marrow.

patient was restricted to a diet free from meat
t products during the whole study. Base-line
ions were made daily on each patient for 3–30
eding vitamin B_{12} therapy. Some of the patients
erved throughout several periods of treatment;
each treatment period there was an interval of
ks, depending on the red-cell counts and the
general condition.

nethods of blood determinations (Spies 1947)
n published so many times from the clinic that
not repeated here.

only been possible here to indicate the effective
ange and summarise some illustrative case-
. Ten cases (including cases 5 and 8 below)
crystalline B_{12}; the remainder received highly
concentrates.

PERNICIOUS ANÆMIA (16 CASES)

.—A man, aged 49 (see figure). *Hæmopoietic response*
in B_{12} 450 µg. by mouth daily for ten days:

	Red cells (mill. per c.mm.)	*Hb (g. per 100 ml.)*	*Reticulocytes (%)*
	2·27	8·0	2·6
yte peak (10th day tment)	—	—	35·7
after treatment	3·35	11·3	4·0

2.—A man aged 70. Hæmopoietic response to one
itamin B_{12} 30 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
	2·24	10·0	0·8
yte peak	—	—	None
after treatment	2·15	9·9	1·0

Study after 2 Weeks' Interval

opoietic response to one dose of vitamin B_{12} 50 µg.
th:

	Red cells	*Hb*	*Reticulocytes*
	1·99	8·5	0·2
cyte peak	—	—	None
after treatment	1·86	8·6	0·4

tudy after 2 Weeks' Interval

opoietic response to one intramuscular injection of
B_{12} 25 µg.:

	Red cells	*Hb*	*Reticulocytes*
	2·06	10·2	0·2
cyte peak (7th day injection)	—	—	10·2
days after treat-	2·76	12·0	0·6

Study after 6 Weeks' Interval

opoietic response to vitamin B_{12} 800 µg. daily by
for two days:

	Red cells	*Hb*	*Reticulocytes*
	1·28	4·2	1·0
cyte peak (6th day treatment)	—	—	21·0
days after treatment	2·82	8·2	0·6

Case 3.—A woman aged 77. Hæmopoietic response to one dose of vitamin B_{12} 100 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	2·70	11·0	0·8
Reticulocyte peak (6th day after treatment)	—	—	2·6
Ten days after treatment	2·81	10·4	0·4

Second Study after 2 Weeks' Interval

Hæmopoietic response to one dose of vitamin B_{12} 400 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	2·70	11·3	1·0
Reticulocyte peak (4th day after treatment)	—	—	2·0
Ten days after treatment	2·81	10·9	0·2

Third Study after 2 Weeks' Interval

Hæmopoietic response to one intramuscular injection of vitamin B_{12} 45 µg.:

	Red cells	*Hb*	*Reticulocytes*
Initial	2·64	12·0	0·6
Reticulocyte peak (4th day after treatment)	—	—	2·4
Twelve days after treatment	3·02	11·3	0·4

NUTRITIONAL MACROCYTIC ANÆMIA (17 CASES)

Case 4.—A man aged 68. Hæmopoietic response to vitamin B_{12}, 150 µg. by mouth daily for twenty days:

	Red cells	*Hb*	*Reticulocytes*
Initial	2·54	9·1	4·3
Reticulocyte peak (9th day of treatment)	—	—	25·1
Twentieth day of treatment	3·55	12·1	8·4

Case 5.—A woman aged 56. Hæmopoietic response to one dose of vitamin B_{12} 500 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	2·40	9·3	1·0
Reticulocyte peak (7th day after treatment)	—	—	10·9
Twelve days after treatment	3·03	10·1	2·4

Second Study after 6 Weeks' Interval

Hæmopoietic response to vitamin B_{12} 150 µg. daily by mouth for twenty-seven days:

	Red cells	*Hb*	*Reticulocytes*
Initial	2·37	8·6	2·4
Reticulocyte peak (11th day of treatment)	—	—	13·3
Twenty-seventh day of treatment	3·47	11·1	3·2

TROPICAL SPRUE (14 CASES)

Case 6.—A man aged 69. Hæmopoietic response to one dose of vitamin B_{12} 500 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	1·50	8·6	0·2
Reticulocyte peak (9th day after treatment)	—	—	9·0
Ten days after treatment	1·83	10·0	0·8

Second Study after 3 Weeks' Interval

Hæmopoietic response to vitamin B_{12} 150 µg. by mouth daily for forty-five days:

	Red cells	*Hb*	*Reticulocytes*
Initial	1·53	9·4	0·8
Reticulocyte peak (13th and 19th days of treatment)	—	—	7·0
Forty-fifth day of treatment	2·38	11·4	0·1

Case 7.—A man aged 62. Hæmopoietic response to one dose of vitamin B_{12} 30 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	1·29	2·7	1·4
Reticulocyte peak (9th day after treatment)	—	—	3·4
Twelve days after treatment	1·30	6·2	0·2

Second Study after 3 Weeks' Interval

Hæmopoietic response to one dose of vitamin B_{12} 500 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	1·81	8·7	0·4
Reticulocyte peak	—	—	None
Ten days after treatment	2·30	8·8	0·1

Third Study after 6 Weeks' Interval

Hæmopoietic response to one dose of vitamin B_{12} 1500 µg. by mouth:

	Red cells	*Hb*	*Reticulocytes*
Initial	1·19	4·8	0·8
Reticulocyte peak (8th day after treatment)	—	—	9·0
Twenty-one days after treatment	1·86	7·1	0·4

Case 8.—A man aged 72. Hæmopoietic response to one dose of vitamin B_{12} 30 μg. by mouth:

	Red cells	Hb	Reticulocytes
Initial	2·45	10·4	0·2
Reticulocyte peak	—	—	None
Ten days after treatment	2·55	10·1	0·2

Second Study after 4 Weeks' Interval

Hæmopoietic response to one dose of vitamin B_{12} 300 μg. by mouth:

	Red cells	Hb	Reticulocytes
Initial	1·92	8·4	0·2
Reticulocyte peak (6th day after treatment)	—	—	3·2
Ten days after treatment	1·94	8·0	0·2

Third Study after 2 Weeks' Interval

Hæmopoietic response to vitamin B_{12} 150 μg. daily by mouth for twenty days:

	Red cells	Hb	Reticulocytes
Initial	1·71	7·3	0·2
Reticulocyte peak (8th day of treatment)	—	—	2·2
Twentieth day of treatment	1·58	6·9	0·4

Fourth Study after 2 Weeks' Interval

Hæmopoietic response to intramuscular vitamin B_{12} 30 μg. daily for three days:

	Red cells	Hb	Reticulocytes
Initial	1·47	7·8	0·4
Reticulocyte peak (7th day after treatment)	—	—	20·1
Eleven days after treatment	2·78	9·4	0·2

We are making special studies on this man. He does not seem to absorb any substance effectively from his alimentary tract.

NON-TROPICAL SPRUE (2 CASES)

Case 9.—A man aged 64. Hæmopoietic response to one dose of vitamin B_{12} 50 μg. by mouth:

	Red cells	Hb	Reticulocytes
Initial	2·36	6·6	1·0
Reticulocyte peak (3rd day after treatment)	—	—	3·0
Four days after treatment	1·73	6·3	3·3

Second Study after a Week's Interval

Hæmopoietic response to vitamin B_{12} 450 μg. by mouth daily for six days:

	Red Cells	Hb	Reticulocytes
Initial	1·73	7·1	2·0
Reticulocyte peak (4th day of treatment)	—	—	9·1
Fourteen days after treatment	2·32	8·6	2·7

CONCLUSIONS

The minimum, maximum, and optimum dose of vitamin B_{12} varies from patient to patient and from time to time in the same patient; therefore no routine of treatment can be followed satisfactorily. The best method will have to be found for each case. As soon as possible, the patient should have a diet that supplies adequate calories and a liberal amount of protein of high biological value.

Vitamin B_{12} is more efficacious per unit of weight when given parenterally than when given by mouth, as is shown in cases 2 and 7. Irrespective of age or any other condition, vitamin B_{12} should always be given parenterally when the patient has severe cardiac failure, severe neural degeneration, or a severe alimentary disturbance. In most extremely ill patients the initial treatment at least should be parenteral. Nevertheless this report shows that vitamin B_{12} given by mouth in adequate amounts is often efficacious. It must be recognised, however, that some patients have macrocytic anæmia with megaloblastic arrest of the bone-marrow which does not respond to liver extract, folic acid, or vitamin B_{12}, whether given parenterally or by mouth. There were several such patients in the present series. On the whole, most patients respond slowly when vitamin B_{12} is given by mouth in an amount 30–60 times by weight that required for parenteral therapy.

Parenteral administration produces more rapid improvement, ensures that altered gastro-intestinal function cannot block absorption, and can always be supervised by a physician, thus eliminating the bility of interference where the patient has an aversion to injections. Moreover, though we seen a patient who is allergic to vitamin B_{12} or the concentrates of it, almost certainly such a pa eventually be found. Some patients acquire a to parenteral liver extract so that injections reactions varying in intensity from mild to In such cases oral administration is often e vitamin B_{12} by mouth may be useful where a reacts severely to injections of the substance.

This study was aided by a grant from the National Foundation, Inc. The vitamin B_{12} was supplied Augustus Gibson, of Merck & Co., Inc., Mr. W. R. and Dr. H. Sidney Newcomer, of E. R. Squibb & Dr. E. Gifford Upjohn and Dr. Earl L. Burbidge, of the Company.

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URINARY EXCRETION OF RADIOAC IODINE AS A DIAGNOSTIC AID THYROID DISORDERS

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THE increased availability of radioactive i recently led to its use in the assessment of function in man. Methods have been desc determining the uptake of iodine by the th disappearance from the blood, and its excretion in Most investigators have administered radioactive by mouth, and it has been shown that, in ge least 98% of the tracer dose will be rapidly absor the blood-stream (Hamilton and Soley 1939), justifies the assumption that all the dose is a and determinations of activity can therefore be e as a percentage of the dose administered. Altera thyroid function is accompanied by changes uptake of iodine by the gland and in urinary ex The proportion of a dose of radioactive iodine e in the urine has been shown to vary inversely thyroid activity, and this has been used as a di test in thyroid dysfunction. Bulk samples of collected over 24 or 48 hours are sufficient to difference in the percentage of a tracer iodine excreted by normal and thyrotoxic subjects (Mc et al. 1948). Marinelli et al. (1948) noted tha difference is best shown by measuring the excre radio-iodine from the 6th to the 24th hour after a tration of a tracer dose. Keating et al. (1947), intensive study of these curves, developed a met calculation to provide an index of iodine uptake thyroid.

The present investigation has been undertak determine whether the urinary excretion of radio can be developed as a routine diagnostic test in pa with thyroid disease. It was realised that direct tion of thyroid uptake, in conjunction with estin of blood-iodine (Myant et al. 1949), gives a more picture of thyroid function than do urinary values for routine use a method must be simple and inva he patient. Radioactivity in urine can be d accurately with very low doses of tracer urther, the method involves less apparatus and space than does direct thyroid counting and y disturbance of the patient. To determine nethod of using the urinary excretion of radio- an index of thyroid activity. Keating's method ting thyroid uptake was compared with excre- ies measured on bulked samples of urine. ictors, other than thyroid activity, which might excretion of radio-iodine were also investigated.

METHOD

ome preliminary trials a standard dose of about uries of I^{131}, measured according to the Medical Council (1948), was adopted. This was found urinary excretion suitable for measurement in of thyrotoxicosis: in people with normal or ed thyroid function the dose can be reduced to uries. The irradiation of the thyroid by a curie dose can be calculated from the figures Marinelli et al. (1948). If all the dose is taken thyroid weighing 25 g. and evenly distributed ut the gland, the thyroid will receive about 5 r st day and a total of about 60 r in three weeks. not all the dose will be taken up by the thyroid, etion from the gland will further reduce the received. In a normal person there may be 50% collection by the thyroid and a dose of uries will have a "biological" half-life in the of about six days instead of the physical half-life days: in this case the thyroid radiation will be r in the first day, with a total of about 12 r. to other parts of the body will be at a very wer level. The radiation hazard with such a s considered to be negligible.

ndling of I^{131} was carried out with precautions o those outlined by the Ministry of Supply (1949). isite dose of I^{131} (carrier-free as supplied) was mixed ml. of distilled water to which about 50 µg. of inert odide had been added. A mixture of radioactive ith inert carrier iodide is always advisable to reduce e tracer material by adsorption on to glassware &c., small amount of carrier iodide is not sufficient to roid activity. As a standard solution for comparison ctivity with the urine samples, 5 ml. of the prepared s added to 45 ml. of sodium iodide solution (1%). aining 45 ml. of the dose was drunk by the patient; ter was rinsed with distilled water, and this was also ered. The dose was usually given about 2 hours eakfast, and complete urine collections were made 9, 12, and 24 hours later. Inert sodium iodide (10 ml.) was added to each sample of urine directly een passed.

volume of each urine sample was recorded, and ivity was measured on a 10 ml. sample. The agree- duplicate samples was very satisfactory. A glass ounter of the type described by Veall (1948) was conjunction with conventional quenching and scaling The total activity of each sample was compared e standard solution and was expressed as a percentage ose administered.

inimise contamination errors in the counter, the were counted in order of increasing activity, beginning e last specimen passed and ending with the standard. ach measurement the counter was carefully rinsed ert iodide solution, and a background count was d. With this technique the background count was ined at a reasonable level.

vance must be made for the "dead time" of the with high rates of counting. In practice this correc- as negligible, since count-rates were below 3000 per If necessary the standard was diluted to give the rder of count-rate. For convenience, counting-time ept short, an accuracy of about 5% being found nt. An accuracy of up to 1% can be obtained by ing the counting-time when only one or two samples be counted, but after longer counting-times decon- ation of the counter is more difficult.

RESULTS

A comparison of the 24-hour excretion of I^{131} in urine was made in 54 patients in whom the clinical evidence clearly indicated normal, increased, or decreased thyroid activity. Excretion studies were also made on 16 patients in whom the clinical diagnosis of thyrotoxicosis was doubtful. In 9 patients excretion tests were repeated, and the results were reproducible within the variation seen from case to case in the normal people.

A total of 28 excretion tests was performed on 16 normal subjects convalescing from some unrelated disorder; these included 12 men and 13 women, aged 14–60 years, free from any evidence of intestinal, thyroid, or kidney disorder. Seven cases of myxœdema were studied, 3 with well-marked clinical features of the disease. There were 22 patients with undoubted evidence of increased thyroid activity; these included 4 males and 18 females aged 16–67. On the clinical assessment, including the basal metabolic rate (B.M.R.), thyrotoxicosis was severe in 7, moderate in 11, and mild in 4.

The 24-hour excretion of radio-iodine varied from 5 to 26% of the administered dose in thyrotoxicosis, and from 28 to 72% in normal people (fig. 1). This gave a reasonable difference between the means for the two groups, but there was a wide scatter in the normal series. The values in myxœdema were within the normal range.

A more satisfactory separation was obtained by subdividing the 24 hours of observation. In the first 6 hours after administration of I^{131} the percentage excreted was not much different in normal people and in thyrotoxic patients; but the subsequent period of excretion, from 6 to 24 hours, showed a clear separation between the two groups. During this period the amount of I^{131} excreted by normal people varied from 10 to 25%, whereas the highest amount excreted by any thyrotoxic patient was 4·5%, and most of them excreted under 2%. Further, percentage excretion over the 6–24 hour period was more closely related to the clinical assessment than was 24-hour excretion. The difference between the normal person and the hypothyroid patient was not so well marked; thus over this period the myxœdematous patients gave a percentage excretion varying from 26 to 39%.

In the whole series it was found that a 6–24 hour excretion of under 4% of the tracer dose indicated definite thyroid overactivity. Excretion of over 25% was characteristic of myxœdema.

Our figures for radio-iodine excretion were analysed in an attempt to confirm Keating's findings and to compare the results of his more elaborate method of calculation with the examination of bulk samples described above. In general it was found that the summed urinary excretion plotted against time approximated to an exponential form, and a mean exponential curve could be drawn through the actual values. Any gross variation of one sample from this mean curve was always found to result from an error in urine collection: so inspection of the curve provided a useful check on the accuracy of the collections. Typical curves obtained for the three groups of patients are shown in fig. 2.

There are, however, variations from exponential form towards the end of the excretion period. In normal persons and in myxœdematous and "doubtful thyrotoxic" patients a mean exponential can be drawn to include all individual urine samples throughout 24 hours, but in undoubted thyrotoxicosis the excretion is of exponential form only in the earlier stages, after which follows a period of roughly linear excretion. In general the greater the degree of thyrotoxicosis the more quickly does the exponential phase of excretion cease. Keating et al. (1947) concluded that the amount of excretion after the exponential phase was related to the degree of thyrotoxicosis, but our results do not bear this out.

The rate of thyroid uptake of iodine was next calculated by Keating's method (see appendix). In this calculation it is assumed that the total tracer dose is absorbed very quickly into the blood-stream, and that the removal from the blood only takes place via the kidney and the thyroid. Renal excretion follows an exponential form and it is assumed that the thyroid uptake follows a similar pattern—i.e., the rate of removal of iodine from the blood-stream by either organ is proportional to the concentration in the blood. Each route of loss will be characterised by its own rate factor, the total rate factor for disappearance from the blood being the sum of renal and thyroid rates. The thyroid-rate factor is an index of the speed of thyroid collection of iodine and should parallel thyroid activity.

The thyroid rates in the groups already described are represented in fig. 1. The normal range was 0·055–0·1 per hour. In myxœdema it varied from 0·005 to 0·04 per hour, the higher values being obtained in the less severe cases. There was a wide range in the thyrotoxic group, from 0·28 to 1·18 per hour, and the greater the clinical severity of the thyrotoxicosis the higher was the thyroid rate. The thyroid rate of the mildest case of thyrotoxicosis was more than double the highest normal rate. The mean normal value was about 0·08. In this series myxœdema always gave less than half, and thyrotoxicosis more than three times, the mean normal value. In severe hyperthyroidism the rate was above five times the mean normal.

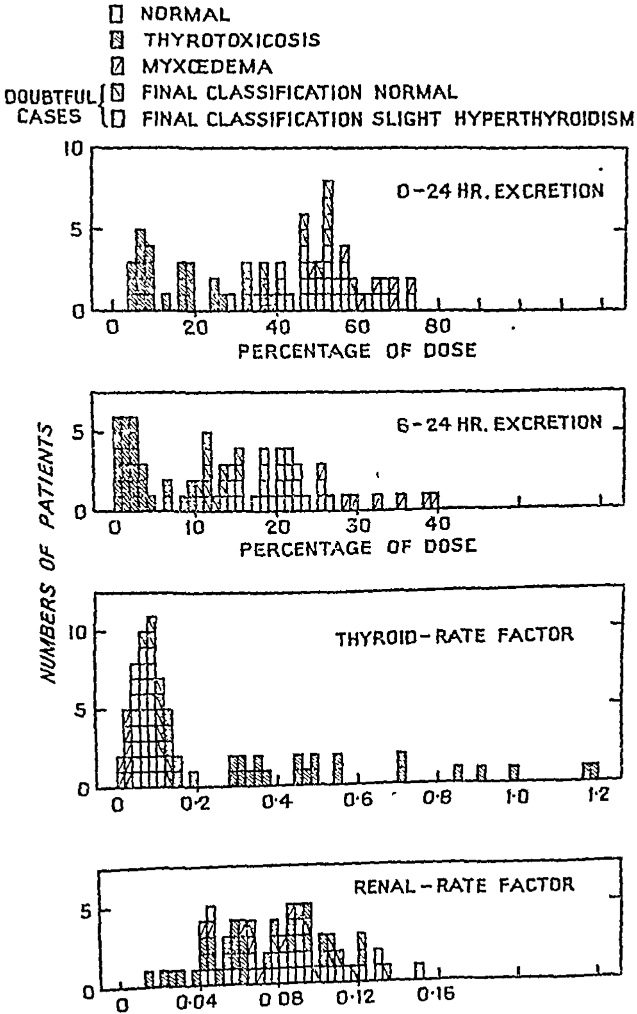


Fig. 1—Urinary excretion of radio-iodine by normal people and in thyrotoxicosis and myxœdema.

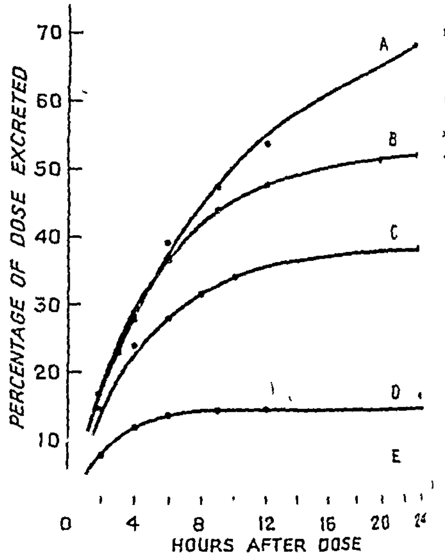


Fig. 2—Urinary excretion of radio-iodine in different stat œdema; B, normal health; C, slight hyperthyroidism; D thyrotoxicosis; E, severe thyrotoxicosis.

Doubtful Cases of Thyrotoxicosis

Excretion tests were performed in 16 pa whom the diagnosis of hyperthyroidism was d The presenting symptoms included nervousne cardia, sweating, loss of weight, and, in some enlarged thyroid. The change in B.M.R. in the was of doubtful significance. Radio-iodine (fig. 1) fell within the normal limits in 10 ca between the normal and hyperthyroid excretion in 6. Clinical assessment based on observation in and on subsequent progress showed a close with the excretion results. Thus, in the case within the normal range the symptoms app more directly attributable to an anxiety sta responded satisfactorily to non-specific the 6 cases outside the normal range the clinical ment favoured mild hyperthyroidism in 5; all, have improved without specific anti-thyroid

The results of radio-iodine excretion tests important group indicate that no sharp line drawn between normal and increased thyroid but they do appear to provide a means of d nating between symptoms attributable to an state and the very similar symptoms associated hyperthyroidism.

POSSIBLE SOURCES OF ERROR

Radioactive iodine was administered to a n patients to investigate the possibility of errors from renal failure, previously administered iodine, sweating, generalised anasarca, defective ab-o and biliary excretion of iodine. The following were obtained.

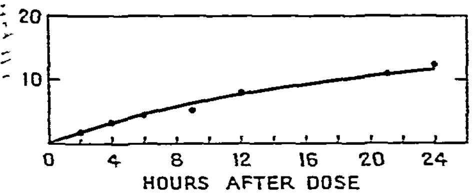
A recognised source of error in assessing function by measuring excretion of radio-iodine impairment of renal function. Four cases of Bright's disease with renal failure (impaired concen power and nitrogen retention) were investigated, all only a small proportion of the dose was excr 24 hours (fig. 3). The excretion figures were 12 18·9, and 26%, which give a false impression of overactivity. This impression was partially c by the 6–24 hour excretion of 7·6, 8·7, 12, and The curves of radio-iodine excretion could be inte on an exponential basis in 3 of the 4 patients, were about 0·01 per hour, or well below the ɡe. The thyroid rates were around the lower rmal, showing that this method of analysis onable correction for considerable alterations ction.

ıerapy before administration of radio-iodine se the excretion of radio-iodine and may normal excretion curve in a patient with yrotoxicosis. The following case illustrates

dide was administered for 3 weeks in a moderately of hyperthyroidism. The radio-iodine excretion then within normal limits, with a 6–24 hour 29·3% and thyroid rate of 0·04 per hour, though f thyrotoxicosis were still manifest.

of the excessive sweating often associated otoxicosis it was decided to measure the ı of I^{131} in the sweat. One normal person ous exercise for 2 hours, and another for fter a dose of I^{131}, and sweat was collected ag one arm in a Stallard-Bunyan bag; 10 ml. of sweat from these peoples contained only ıd 0 012% of the ingested dose. It was not , therefore, that loss of tracer iodine in the ld introduce a significant error in determining ınction. Excretion of I^{131} was also measured le of two patients whose common bile-ducts g drained surgically. The I^{131} content of a ollection of bile was 0·5% and 0·6% of the inistered.

w cases the early excretion values were low appeared to be a delay before the excretion ame exponential in form. This was found in



inary excretion of radio-iodine by patient with renal failure.

rmal people (fig. 4, curve A), and a more pro- delay was shown in two tests in a severe case orrhœa (fig. 4, curve B). This effect may be d with slow absorption from the gut. If all the finally absorbed, neither the total urinary n nor the calculated thyroid rate will be affected. ever, a part of the dose is not absorbed, a false re will be obtained for urinary excretion which l to a false high value for the calculated thyroid he rate factor for the disappearance of I^{131} from od will, however, be unaffected. Though some s detected in the fæces of the patient with hœa, no disparity was found between the thyroid- ctor and the 24-hour excretion either in this or in the normal people with delayed excretion. ncluded that such loss as may occur with absorp- fects is unlikely to introduce significant error in erpretation of urinary radio-iodine excretion.

ated tests in a patient with and without fever no significant difference between the two results. se of constrictive pericarditis, with serous effusions ome generalised œdema, radio-iodine excretion ormal in all respects, and was not significantly when a second tracer dose was given immediately he removal of 4 pints of pleural fluid and an on of 'Neptal' which doubled the urinary output. onal factors did not appear to alter the excretion n any way.

DISCUSSION OF RESULTS

The 0–24 hour excretion, 6–24 hour excretion, and thyroid-rate values in normal people and patients with thyroid disorder are compared in fig. 1. A close correlation is found between the 6–24 hour excretion and thyroid rates for all groups of patients. The normal range of 20–10% in 6–24 hour excretions corresponds to a range of 0 06–0·12 in the thyroid rate. The 6–24 hour excretion is as reliable as the calculated thyroid rate merely as an aid to the diagnosis of thyrotoxicosis and it is more simple for routine use. In severe and moderately severe cases of thyrotoxicosis, however, the thyroid-rate values give a wider scatter (0·48 to 1·18) than the 6–24 hour excretion, since the latter falls below 2·5% in these cases. For this reason the thyroid rate gives a more accurate quantitative indication of thyrotoxicosis.

In distinguishing between normal people and patients with myxœdema both methods gave some assistance, but neither is really satisfactory, and it is felt that further work covering the 24–48 hour excretion period is necessary.

It must be remembered that the clinical picture of thyrotoxicosis is not absolutely related to the degree of thyroid activity, since individual sensitivity to thyroid hormone may vary and other factors contribute to the clinical picture. Thus, in a thyrotoxic patient the pattern of radio-iodine excretion indicates the degree of thyroid activity and not necessarily the clinical state.

SUMMARY AND CONCLUSIONS

The estimation of urinary excretion of radioactive iodine, I^{131}, administered by mouth is a valuable diagnostic aid in thyroid disease. The method can be made simple and safe enough to justify its use as a routine procedure. A dose of 10 microcuries has been found sufficient and is recommended as a maximum for this investigation.

Measurement of excretion in bulked urine samples collected between the 6th and 24th hour after administration of the dose provides a reliable diagnostic test for thyrotoxicosis. In the present series a 6–24 hour excretion of under 4% indicated definite thyroid overactivity, excretion of 10–25% occurred in normal people, and over 25% was typical of myxœdema.

Plotting of the urinary excretion curve and derivation of the thyroid-rate factor as suggested by Keating et al. (1947) gives a more satisfactory separation of the thyrotoxic from normal persons and provides a better estimate of the degree of overactivity than does measurement of a bulked sample. The results in myxœdema

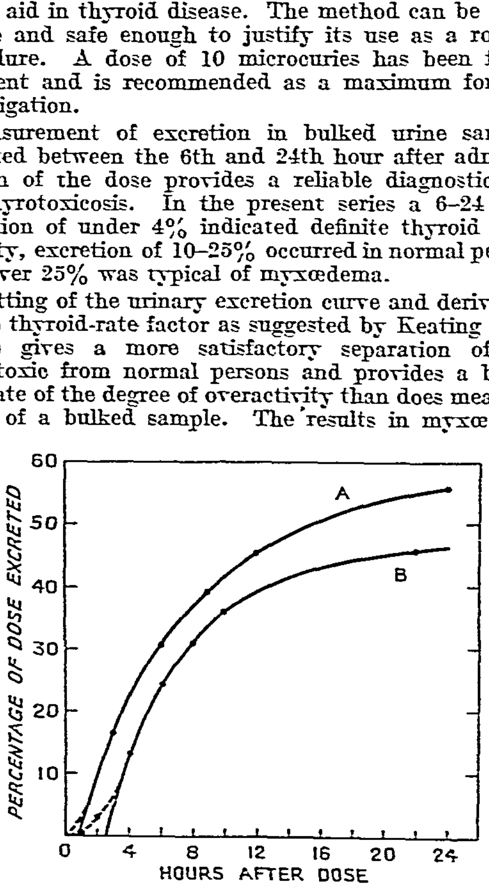


Fig. 4—Delay in exponential form of curve of urinary excretion of radio-iodine by: A, normal person; B, patient with steatorrhœa.

are of diagnostic value but are less clear-cut. In the present series the range of the calculated thyroid rate was 0·005–0·04 per hour in myxœdema, 0·055–0·12 per hour in normal people, and 0·28–1·18 per hour in thyrotoxicosis.

The method provides a satisfactory diagnostic aid in cases of doubtful thyrotoxicosis.

Loss of radio-iodine in sweat and bile is unlikely to be greater than 2–3% of the dose and will not appreciably affect estimates of thyroid activity. Impairment of renal function makes interpretation of the excretion curve difficult and may invalidate the result.

We wish to acknowledge the encouragement and interest of Prof. Clifford Wilson and Mr. Frank Ellis, and the help of Mr. W. S. Hartnell, who has assisted in the radioactive assay.

APPENDIX

Adopting Keating's terminology, if Q_f is the proportion of the dose finally excreted by the kidney, and r is the rate factor for disappearance of iodine from the blood, then the renal-rate factor is given by Q_f, and the thyroid-rate factor by $r(1-Q_f)$. It is possible to derive the values of r and Q_f, and therefore of the thyroid-rate factor $r(1-Q_f)$, directly from the curve of urinary excretion. Thus the value of the thyroid-rate factor is obtained independent of renal function.

The method of analysis given by Keating may be expressed mathematically as follows:

If Q_B is the proportion of the tracer dose in the blood after a time t, then:

$$\begin{aligned} \text{rate of loss from the blood into the thyroid} &= r_tQ_B \\ \text{,, ,, ,, ,, ,, ,, ,, ,, kidney} &= r_uQ_B \\ \text{and total ,, ,, ,, ,, ,, ,,} &= -\frac{dQ_B}{dt} = (r_t+r_u)Q_B \\ &= rQ_B \\ \text{and } Q_B &= e^{-rt} \end{aligned}$$

where r is the rate factor for disappearance from the blood, and r_t and r_u are the thyroid-rate and renal-rate factors respectively. The rate of appearance of labelled iodine in the urine

$$=\frac{dQ_u}{dt} = +\,r_uQ_B = +\,r_ue^{-rt}$$

Integrating this gives

$$Q_u = -\left(\frac{r_u}{r}e^{-rt}\right) + A \quad . \quad . \quad . \quad (1)$$

where A is the integration constant.

For $t = 0$, $Q_u = 0$, so $A = +\frac{r_u}{r}$

For $t = \infty$, Q_u = the proportion of the dose which is finally excreted $= Q_f$.

So $A = Q_f$, and $r_u = rQ_f$.

Therefore $r_u = rQ_f$ and $r_t = r(1-Q_f)$ as given in the text.

Equation (1) becomes

$$Q_u = Q_f\,(1-e^{-rt}) \quad . \quad . \quad . \quad (2)$$

This is the equation for the curve of iodine excretion with time. Q_f may be obtained by drawing in the curve and judging its asymptote. Equation (2) may be rewritten:

$$\log_e (Q_f - Q_u) = (\log_e Q_f) - rt.$$

If then the values of $(Q_f - Q_u)$—i.e., the amount still to be excreted in the urine—are obtained from the estimated Q_f and the observed excretions, and the natural logarithms of these values are plotted against time, a straight line graph will be obtained if the excretion curve is of exponential form. The slope of this straight line gives the value of r, the total rate factor. In practice the values of $Q_f - Q_u$ are plotted against time on log-linear graph paper. This involves the use of logs to base 10 and r is given by:

$$r = \frac{\log_{10} Q_f - \log_{10}\frac{Q_f}{10}}{\left(\text{time for } Q_f - Q_u = \frac{Q}{10}\right)\log_{10}e} = \frac{1}{\left(\text{time for } Q_f - Q_u = \frac{Q_f}{10}\right)\times 0{\cdot}434}$$

It may be found that this second plot does not lead to a straight line. However, *it is usually possible to alter the value* of Q_f slightly until the points do lie along a The log plot therefore provides a method of original estimate of Q_f.

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URINARY EXCRETION OF RADIOA IODINE AS A DIAGNOSTIC TEST THYROID DISEASE

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It has long been known that thyroid tissue in its great capacity to concentrate iodine, recently has the development of radioac techniques made measurement of this capacity able. Thus, an additional and much needed c of thyroid function should now be available, the thyroid's avidity for iodine proves a valid the gland's functional state. A tracer dose of iodine, small enough to be an insignificant f patient's usual daily intake of iodine, can be a and its fate followed accurately by measuring activity. Normally, about half the dose is co in the thyroid and the residue is almost entirely in the urine; the radioactivity appearing in thyroid or the urine can be measured to index of thyroid function.

In 1939 Hamilton and Soley published the fi observations made with I^{131}, and many obse have used this isotope to assess the avidity of the for iodine. The rise in concentration of I in the gland may be measured directly in vi tracer dose has been given (Hamilton and S 1940, Hamilton et al. 1943, Werner et al. 1 measuring the plasma levels of I^{131} as well accumulation in the thyroid, Pochin (1948) has the thyroid's rate of clearance of I^{131} from the which he finds a more sensitive index of thyroid Either of these procedures is technically d present. Hertz and Roberts (1942) suggested urinary excretion of I^{131} alone might provide clinical index of thyroid function; and this has been examined by Keating et al. (1947), et al. (1948), and Skanse (1948). These work used relatively large doses of I^{131} and various a carrier, and their "normal" groups included with cancer. A standardised method sufficie and valid for routine clinical adoption has not established. McConahey et al. (1949) studied of radio-iodine in the blood and found that no better index of thyroid function than urinary excretion.

We report here some further studie urinary excretion of I^{131} by 30 normal typical thyrotoxic patients, and 3 hyp patients, and suggest a practicable form for a cli The radiation exposure from the small dose g that often used in X-ray diagnosis. Urine 1 for 48 hours in four subdivisions whose measurement facilitates the detection of from the normal range outlined.

METHOD

of Patient

scertained that no thyroid extract, iodides, thio- or anti-thyroid drugs had been given recently. as given by mouth in the early morning after an fast. No solid food was allowed until an hour se had been drunk. During the period of collection t and activities were allowed, sedatives were not nd the patient was encouraged to drink enough to quate samples of urine at the times of collection.

m iodide 10 µg. containing 10 microcuries of diluted to 50 ml. and transferred to the dose ml. of the dose was then pipetted directly into % potassium iodide solution to serve as the standard ubsequent urine estimation. The patient drank directly from the bottle, which was then rinsed 1 water and the washings were also drunk. This was designed to avoid errors due to adsorption on to glassware.

ses the residue in the bottle was estimated; 5% otassium iodide was left in the bottle for 24 hours xchange between adsorbed I^{131} and inactive iodine ution. The total activity of this solution was not 1 0·04% of the dose.

of Urine

as collected for 48 hours after the dose was drunk. rly investigation samples were taken roughly every the first 8 hours, and for the rest of the 48 hours nes desired by the patient. Later in the investigaples were pooled into four collections: 0–8, 8–12, d 24–48 hours.

ales studied urinated directly into the specimen Females used bedpans for the most part, but a atheter was passed in some, and in others urine was rough a specially arranged funnel directly into the bottle.

e patients examined were in hospital when tested. s taken to ensure that the urine collections were and accurately timed. Six collections whose ss was in doubt were excluded.

on of Activity in Urine

oncentration of radioactive iodine in the urine was d directly with that in the standard solution, by f the Geiger-Müller counter described by Veall (1948) nating liquid samples. The activity in each urine was then expressed as a percentage of the dose ered.

lly, when frequent samples were collected in all tests, nple was counted for five minutes, and so the counting ned with the concentration in the sample, the standard om the first 8 hours being about 1·5%, from the 24th out 10%, and from the 48th hour about 30%; but ndard error of the four pooled collections computed ese data would be less than 7%, and that of the total n less than 1·5%. Later, when only the four pooled ons were measured, counting errors did not exceed limits. Finally, when the following concentration re was adopted for weak samples, all counts involved lard error of less than 3%.

of Concentrating I^{131} in Urine Samples

method involves the precipitation of the urinary as silver iodide, which is then redissolved in a much volume of sodium iodide solution. The resulting n is considerably more dense than the standard solution. onsequently a greater proportion of the radiation is ed before reaching the sensitive volume of the counter. ection must therefore be added to the counting-rate ed before it is compared with that of the standard. By using standard quantities of reagents final solutions of constant density are obtained; hence, the correction to be applied is the same for all samples. The method is accurate to 1% but is not reliable when there is albuminuria or after bacterial decomposition of the urine. Delay in processing samples should therefore be avoided.

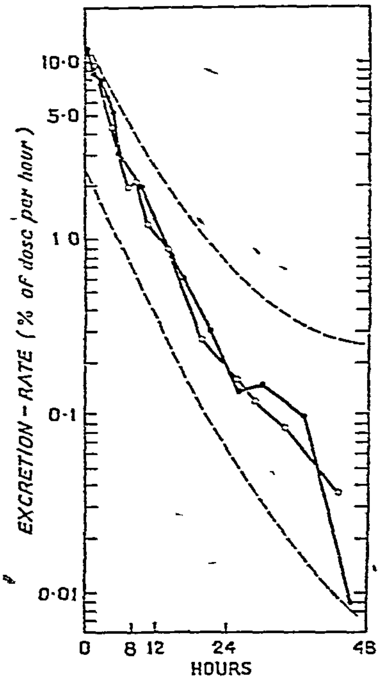

Fig. 1—Results of two tests at 11 months' interval on a normal man. The dose of radioactive iodine (10 microcuries of I^{131} with 10 µg. of potassium iodide) was given by mouth at 0 hours. The curve shows the changing rate of the urinary excretion of I^{131}. Normal observations fall within the area enclosed by interrupted lines (see fig. 2B).

To 5 ml. of a solution of sodium iodide containing 11·8 g. per litre (equivalent to 10 mg. of iodine element per ml.) a measured volume of urine is added, usually 50–200 ml.

Sufficient nitric acid (sp. gr. 1·84) is added to keep the sample permanently acid during the precipitation process which follows; this is indicated by the addition of 1 drop of starch solution.

To the solution 5 ml. of silver nitrate (20 g. per litre) is added drop by drop with constant stirring in the cold. This quantity is sufficient to precipitate all the iodide and a little of the chloride present. The solubilities of silver iodide and silver chloride are such that precipitation of the chloride is delayed until precipitation of the iodide is substantially complete. The blue colour of the starch iodide is, of course, discharged at the end-point.

If the reaction is properly performed with clean (grease-free) utensils, the precipitate should be granular and should settle quantitatively overnight. Centrifuging is often necessary.

When completely settled, the supernatant liquor is removed as far as possible with a finely drawn out tube connected to a water pump. With practice this can be done without loss.

To the sediment is added 5 ml. of sodium iodide solution (472 g. per litre) which is sufficient to dissolve the silver iodide. The solution is then removed with a dropper to a 20 ml. volumetric flask, and the transfer is completed by rinsing with a further 5 ml. of sodium iodide solution introduced in small quantities with the dropper. The flask is

TABLE I—RESULTS OF REPEATED TESTS ON THE SAME PEOPLE

Subjects	Age (yr.)	Months between two tests	Percentage of administered I^{131} excreted									
			0–8 hr.		8–12 hr.		12–24 hr.		24–48 hr.		Total 0–48 hr.	
Normal men:			Mean	Diff.	Mean	Diff.	Mean	Diff.	Mean	Diff.	Mean	Diff.
No. 1 ..	37	7	36·0	1·0	6·0	2·3	6·9	1·5	3·7	1·3	52·5	4·1
No. 2 ..	29	11	48·8	1·8	6·4	0·7	5·5	0·7	2·0	1·0	62·6	4·2
No. 3 ..	29	2	*	*	7·1	1·1	8·6	1·8	3·5	2·0	..	..
Woman with myxœdema	33	6	41·5	1·5	10·8	4·6	20·2	0·7	18·5	4·4	91·0	2·0

* Specimen lost during one of these periods.

I^{131} was supplied by Oak Ridge National Laboratories through e Medical Research Council. The dose is measured in terms the microcurie adopted by the M.R.C. for 1949. Owing to the ncertainty of absolute measurements of radioactivity there ay be considerable variations between the units used by the arious investigators. This unit equals about 0·7 Oak Ridge icrocuries as supplied in 1948.

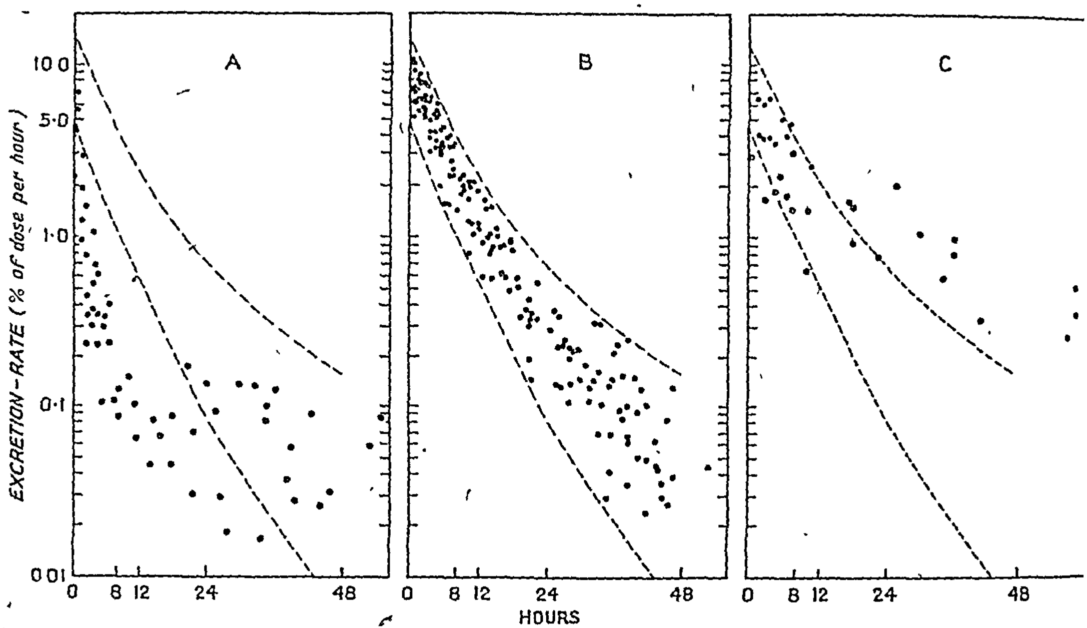

Fig. 2—Results of the radioactive-iodine tests in the three groups studied: A, thyrotoxic patients; B, normal me
C, hypothyroid patients. The results of the test on each person were obtained as for fig. 1, and each single observati
of the rate of excretion has been plotted as a dot. The area enclosing the normal observations (B) has also be
outlined in A and C.

made up to the mark with distilled water and, on shaking, the transient reprecipitation of silver iodide is reversed. An aliquot of this solution is then measured in the counter. The specific gravity of the solution will be 1·177. The density correction required will vary with the type of counter used. With the Twentieth Century Electronics counter type M.6 the observed counting-rate must be multiplied by 1·05 before comparing with the standard.

The counter tube is washed with a solution of sodium iodide (30 g. per litre) which is sufficient to dissolve traces of silver iodide precipitated in the annulus of the counter.

SELECTION OF CASES

Normals

Three groups were selected:

(1) A group of 10 normal male doctors, aged 24–37, who were in good health and had at no time had thyroid disease. These were tested while they were engaged in normal hospital routine duties.

(2) A group of 10 male patients, aged 24–47, who had not previously had thyroid disease and were not in hospital because of endocrine disorder. They were ascertained to be afebrile, with normal erythrocyte-sedimentation rates and no renal disease, and had not received thyroid, iodides, anti-thyroid drugs, or sulphonamide before the test.

(3) 10 normal women, aged 22–60, including 5 hospital workers in normal health and tested at work, and 5

drugs, except 3 who had received
thiouracil some months previously.

All these patients had a raised ba
(B.M.R.) ranging from + 18 to + 74%
the goitre was 3 times the normal gla
the gland was estimated to be $1^1/_2$–2
size. Two patients had heart-failu
none had manifest renal disease. The
were: exophthalmic goitre, 14; toxic
recurrent toxic goitre, 6 (3 after oper
thiouracil).

HYPOTHYROIDISM

The 3 patients tested were chosen a
of hypothyroidism. Two patients,
had developed spontaneous hypothyr
probably primary, since no evidence
injections of thyrotropic hormone wa
patient, aged 33, had secondary hypo
anterior-pituitary necrosis following p
rhage. The B.M.R.s of these cases were
— 29%, the blood-cholesterol levels w
400 mg. per 100 ml., and all the e
showed changes typical of hypothyroid

The subsequent clinical course and re
of the patients with thyrotoxicosis an
has confirmed the initial diagnosis.

TABLE II—SUMMARY OF RESULTS

Group	No. in group	Percentage of administered I^{131} excreted in urine											
		0–8 hr.			8–12 hr.			12–24 hr.			24–48 hr.		
		Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Range	Mean	S.D.	Rang
Normal men at work	10	39·1	6·0	49·7 29·5	7·0	1·9	9·8 3·5	7·2	1·9	10·0 4·4	3·1	1·7	7·1 1·5
Normal male patients	10	38·3	9·3	49·5 26·5	6·1	1·8	7·7 3·0	6 8	1 9	10·8 1·1	2 0	1·4	1 2 0·1
Normal women	10	37·9	5·1	14·3 27·2	7·6	2·3	10·2 1·1	7·2	2 0	11 6 3·8	4·3	2·8	9·4 1·7
Aggregate of normals.. ..	30	38·5	6·9	49·7 26·5	6·9	2·0	10·2 3·0	7·0	2·2	11·6 3·8	3·2	2·2	9·1 0·1
Thyrotoxic patients	26	8·6	3 8	17·1 2·8	0·5	0·1	2·1 0·1	0·7	0·5	1·6 0·1	1·2	0 9	3·1 0 3
Hypothyroid patients.. ..	3	31·6	..	43·5 21·2	6·5	..	11·5 2·5	15·0	..	17·8 10·7	20·3	..	22·8 18·5

TABLE III—COMPARISON OF VALUES OBTAINED IN NORMAL PERSON

ource	No. of normal persons studied	Carrier iodine (µg.)	I^{131} (microcuries)	Total excretion (percentage of dose given)			
				In 24 hours		In 48 hours	
				Mean	Range	Mean	Range
l. (1947) ..	4	100	100	..	..	64·0	60·0–71·0
al. (1948) ..	30	2–200	100–2000	..	..	60·0	23·0–98·0
3)	15	100	100	60·3	48·3–71·5	66·6	52·7–84·1
(1948a and b) ..	30	"carrier-free"	40–100	52·0	28·0–76·0	..	..
es	30	10	10	52·4	37·2–64·5	55·3	37·6–68·7

RESULTS

ıpare the main characteristics of the three thyroid activity, frequently sampled urinary rates of I^{131} were first studied. The mean rate during the time of collection of each as plotted against the mid-time of the period Since the collections were frequent, this gives pproximation to the true excretion-rate. For ndicated shortly, it then appeared that the ificant data for routine use were the fractions during the intervals 0–8, 8–12, 12–24, and ours from administration of the dose. The e therefore also presented in this form.

the tests were repeated on 3 normal men woman with hypothyroidism they showed a ory correspondence (table I).

Thyroid Function

cretion-rates for 10 people are shown in fig. 2B, result for a typical person in fig. 1. It will be t the decrease of excretion-rate with time is exponential, and that the group as a whole is ompact. There is no significant difference the results obtained with the 10 men in good nd at work, the 10 male bed-patients without disease, and the 10 women with normal thyroid (table II). It therefore seems that the excretion differ significantly between the sexes and is not bly influenced by moderate exercise. Further, us correlation was discerned between the amount e excreted in 48 hours and the volume of urine l or the age and weight of the subject.

xicosis

excretion-rates for the 5 patients studied are in fig. 2A. These excretion-rates decrease more than those of the normal persons during the hours, and between the 8th and 12th hour they hest from the normal range. From the 24th to h hour the observations tend to lie within the overed by the normals.

Hypothyroidism

The excretion-rates of the 3 patients tested are initially normal but decrease more slowly, with the result that only after 24 hours are they clearly above the normal range (fig. 2C).

CHOICE OF URINARY SAMPLES FOR A SIMPLIFIED TEST

Study of the excretion-rates shows that excretion in patients with thyrotoxicosis differs most widely from that in normals during the period 8–12 hours, while the few observations in hypothyroidism show the greatest difference from normal excretion during the period 24–48 hours.

The labour involved in this test comes mainly from the number of samples to be estimated. It therefore seemed that the different characteristics of thyrotoxic and hypothyroid patients could be most economically demonstrated by collecting the urine into four samples, excreted during the periods 0–8, 8–12, 12–24, and 24–48 hours. The percentage of the dose excreted during these periods by the 30 normals, 26 thyrotoxic, and 3 hypothyroid patients is shown in table II and fig. 3. The mean excretion of the thyrotoxic patients between the 8th and 12th hours is only a tenth of the mean for the normals during the same period. Between the 24th and 48th hours the mean excretion of the 3 hypothyroid patients is five times that of the normals.

DISCUSSION

The evidence now available suggests that changes in thyroid secretion sufficient to produce a typical clinical syndrome are accompanied by equivalent changes in the thyroid's avidity for iodine. This would be expected, since iodine is one of the essential constituents of the thyroid hormone.

The inactive thyroids of hypophysectomised animals collect less iodine than normally (Leblond and Sue 1940, Leblond 1944), and the overactive glands of animals previously injected with thyrotropic hormone (Hertz

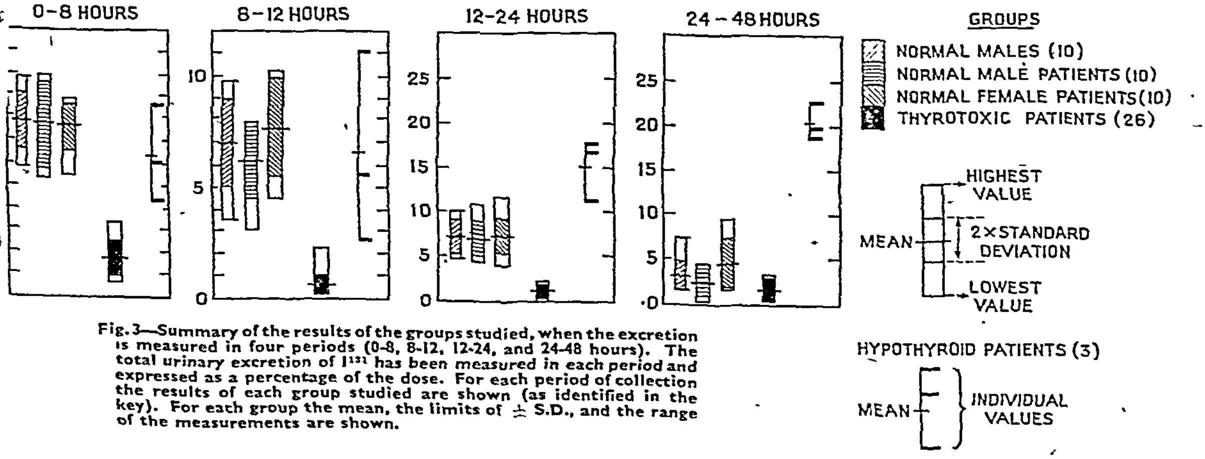

Fig. 3—Summary of the results of the groups studied, when the excretion is measured in four periods (0-8, 8-12, 12-24, and 24-48 hours). The total urinary excretion of I^{131} has been measured in each period and expressed as a percentage of the dose. For each period of collection the results of each group studied are shown (as identified in the key). For each group the mean, the limits of ± S.D., and the range of the measurements are shown.

et al. 1938, Hertz and Roberts 1941, Keating et al. 1945, Leblond and Gross 1948) or exposed to cold (Leblond et al. 1944) collect much more iodine than normally.

Stanley and Astwood (1949) have shown that in normal man the injection of thyrotropin is followed by an increased uptake of iodine. The available clinical measurements of the uptake of radioactive iodine by the thyroids of patients with clinically definite thyrotoxicosis or definite hypothyroidism have given abnormal results in these conditions, an abnormally rapid and high uptake being found in hyperthyroidism and an abnormally slow and decreased uptake in hypothyroidism (Hamilton and Soley 1939, Hertz et al. 1942, Hertz and Roberts 1942, Hamilton et al. 1943, Rawson et al. 1944, Keating et al. 1947, McArthur et al. 1948, Skanse 1948, Werner et al. 1948a and b, Pochin 1948). These observations, though very encouraging, do not indicate whether all clinical abnormalities of thyroid function show a measurably abnormal uptake of radioactive iodine, or whether any other conditions, such as clinically non-toxic goitres and non-thyroid disease, will produce such abnormalities. We are now examining these questions.

Precautions must be observed both in interpreting the percentage uptake of tracer dose of radioactive iodine as an index of the thyroid's avidity for iodine and interpreting that as an index of thyroid secretory function. Clearly the proportion of an administered tracer dose which reaches the thyroid will depend not only on the thyroid's avidity but also on the concentration of iodine available in the body fluids when the tracer is added. Iodine excess due to iodide administration, or when too much carrier iodide is administered with the tracer dose, may lead to an apparently defective uptake. However, where there is no reason to suspect an abnormal intake or loss of iodine by the body, an alteration of the uptake of radioactivity by the thyroid can probably be interpreted as due to a correspondingly abnormal avidity of the thyroid for iodine. Our results with the test show that iodine intake in the diet does not ordinarily vary sufficiently to invalidate this measurement of iodine uptake, for the people we studied were not specially selected and their diet probably varied over the range likely to be encountered in this locality at the present time.

Drugs such as the thiouracil series, thiocyanates, and thyroid extract greatly interfere with the thyroid's uptake of iodine. It is probably not a serious limitation that radio-iodine excretion should only be used as an index of thyroid function when such drugs have not been administered recently. However, Stanley and Astwood (1948) have shown that the reduced uptake of radio-iodine by the thyroid after thiouracil has been given can still be measured and used as an index of thyroid activity; the difference between the thyrotoxic and the normal similarly pretreated with thiouracil, however, is probably too small to be demonstrable except by direct measurement over the thyroid, such as they used. Rawson et al. (1944) found an increased uptake of radio-iodine by a patient who had myxœdema and a goitre, both due to administered thiocyanates. No data are available of the uptake by normal human thyroid glands under less protracted administration of thiocyanate to elucidate this anomalous finding, but it is not likely to be necessary to measure thyroid activity under these conditions. Administration of thyroid extract suppresses thyroid activity and so thyroid uptake of radio-iodine. Skanse and Riggs (1948) have reported pseudothyrotoxicosis due to self-administered thyroid; the clinical signs of thyrotoxicosis were associated with a high B.M.R., but with a low uptake of radioactive iodine. Such an unusual association correctly suggested that the source of excess circulating thyroid hormone was exogenous. Thus a low thyroid uptake of iodine associated thyrotoxic picture should suggest previous administration, while a high thyroid uptake associated with myxœdema should suggest administration of thiocyanates.

There are further disadvantages when the rô thyroid is inferred from observations on the Renal disease, heart-failure, and œdema influence both the uptake of the labelled dos thyroid and its excretion by the kidney. W factors can alter the excretion sufficiently to this test is now being investigated; preliminary tions are that the influence of these factors at least in cases where the test might be required. the measurement of the urinary excretion of *dose of radio-iodine can give only an index* of uptake, it has several practical advantages ov measurement of the uptake of radioactivity thyroid gland. If the thyroid uptake is observed 25 microcuries or more of I¹³¹ must be used and tions made at times dictated by the test; more apparatus is necessary, and it is difficult to record obtained. On the other hand, observ the urine can be made after giving only 10 of I¹³¹ and do not disturb the patient. The ments can be carried out rapidly, accurately, ease at times convenient to the operator. The of urine is a familiar procedure but subject familiar errors unless special care is tak creatinine can be estimated as a check on the of collection.

Our observations on the urinary excreti general agreement with those already availabl et al. 1947, McArthur et al. 1948, Skanse 194 et al. 1948a and b). Though their results entirely translated into the form in which ours presented, table III compares their values o normals.

The slightly smaller excretion found by We (1948a and b) and ourselves might be due to carrier dose, geographical differences, or the cr for selecting normals. The range of norm studied by McArthur et al. (1948) was rather included patients with extensive neoplasti Their series also included persons receiving lar thyroid, which might explain some of their h The overlap of their thyrotoxic and hypothyr *into the normal range* may well be due characteristics of their "normal" group; overlap was found by Werner et al. (1948a Skanse (1948).

Further study of more cases of hypothyro of milder thyroid disorder is required before t of this test can be appraised. It is clear from that, provided the urine collections are acc test is more sensitive when the 48-hour co subdivided; and we find that four subdiv sufficient. Thyrotoxicosis is best revealed excretion in the 8–12 hour period, and hypo by that in the 24–48 hour period, and poo samples with others decreases the sensitivi test.

Keating and others (1947) have suggested matical treatment of the curve of urinary over 72 hours, which permits estimation of th rates of removal of I¹³¹ by the thyroid and by t We have found that our results conform to th only for about the first 10 hours of the norm and for as little as 4 hours of some hyperthyr When the analysis is confined to so short a pe two serious disadvantages: it is impossible sufficiently frequent urine samples with accu results from only the early part of such a curve

precisely. In view of these objections we
forgo the advantage of having an index of
tivity independent of renal function in favour
hod we have described.

ing out such a test as this the radiation hazard
borne in mind, for the long-term effects of
are not yet fully known. When radioactive
given, the thyroid receives by far the most
radiation. The approximate radiation dose
to this gland can be calculated from an estimate
s and knowledge of the fraction of the radio-
reted in the first 48 hours (Hertz 1948); in the
n it is assumed that the rest of the radio-
distributed uniformly throughout the thyroid.
ssumption, if 10 microcuries of I^{131} is given and
reted, a gland of mass 20 g. receives about
lf of this during the first week. In the same
walls of the bladder and kidney pelvis receive
)1 r and the blood about 0·004 r. This thyroid
s considerably greater than the dose-rate of
day which has been agreed as the permissible
ody exposure for workers exposed over an
period (Ministry of Supply 1949). It is,
comparable with the dose delivered in routine
ic X-ray procedures. For instance, Martin
stimated that in the course of a barium-meal
tion the skin receives an average of 5 r per film
and 10–20 r a minute during screening, so with
s and two minutes' screening 45 r would be
l to the skin; thus the thyroid tested as described
receives radiation about equivalent to that
by the skin during a barium meal. Many
s have used 100 microcuries or more of I^{131}
r tests, but we feel that such large doses should
led in diagnostic procedures.

SUMMARY

urinary excretion of I^{131} has been followed for
s after the administration by mouth of a tracer
10 microcuries of I^{131} with 10 µg. of potassium
30 normal adults, 26 adults with obvious
xicosis, and 3 adults with obvious hypothyroidism
udied.

ated tests on 4 persons have shown close
ent.

e was no evidence of correlation between the
excretion of the I^{131} and the patients' sex, age,
ght, or with moderate variations in exercise during
t, or with the volume of urine excreted.

parison of the three main groups of normal,
oxic, and hypothyroid has confirmed previous
ations that the rate of fall of urinary excretion
f I^{131} gives an indirect index of thyroid activity.
ple and sensitive differentiation can be made
en these three groups by measuring the urinary
ion in the four periods 0–8, 8–12, 12–24, and
hours. Thyrotoxicosis is then best characterised
w values in the 8–12 hours period, and hypo-
idism by high values in the 24–48 hour period.

ther experience with this test is required, particu-
in cases of mild thyrotoxicosis and hypothyroidism,
f renal and circulatory disease.

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TRANSORBITAL LEUCOTOMY

SOME RESULTS AND OBSERVATIONS

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TRANSORBITAL leucotomy, a modification of the conventional leucotomy of Moniz (1936), was first adopted by Fiamberti (1937), who pierced the skull through the superior orbital plate. Fiamberti (1947) recommends this operation because of its convenience as opposed to the restrictions which a potentially dangerous operation of the Moniz type imposes. Early in 1946 Freeman (1948), in America, operated by this method with promising results. He introduced it to this country at the Burden Neurological Institute, Bristol, in July, 1948.

Briefly, the operation consists in passing a pointed shaft through the superior orbital plate to a depth of about 5 cm. in the brain and, by moving this instrument from side to side, cutting the white matter in the prefrontal area. The objective is the connexion between the thalamus and the anterior prefrontal area. Meyer et al. (1947), from an analysis of retrograde degeneration in the dorsal medial nucleus of the thalamus, concluded that the central part of the pars parvicellularis—i.e., the main part of the dorsal medial nucleus—projects on to cortical areas 9 and 10 of Brodman. These are the areas which transorbital leucotomy is designed to isolate (Freeman 1948).

I report here some observations on the operation of transorbital leucotomy and the results obtained in eight women 9–10 months after operation. The technique used was, in the main, that described by Freeman (1948). Electroconvulsive shock as an anæsthetic was, however, abandoned after the first two cases, except in case 7, where it was used for demonstration purposes at a meeting of the south-western division of the Royal Medico-Psychological Association.

Early in the series it was found that the rounded shaft of the leucotome tended to become firmly fixed in the orbital plate, and for this reason a modified leucotome was used towards the end of the series. This consisted of a flattened oval blade 18 cm. long, tapering to a fine point with a slight bevel. It was marked at 4 cm. and 7 cm. from the tip. It was 4 mm. wide and 2 mm. thick at the 7 cm. mark. This leucotome pierced the orbital plate more easily, and there was very little resistance to its movement from side to side.

There were no postoperative complications of any importance and the only visible sign of operation was swelling and discoloration of the orbital tissues which disappeared in 7–10 days.

The patients were aged 33–72, and all were in a chronic stage of psychosis: schizophrenia 5, agitated

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melancholia 2, and chronic mania 1. No postoperative improvement can be recorded in any of the cases. Two patients died of intercurrent disease 6 and 8 months after operation, and their leucotomy lesions were examined.

LEUCOTOMY LESIONS

Case 1.—A woman, aged 62, with agitated melancholia, underwent operation under thiopentone anæsthesia on Sept. 12, 1948, and died of acute pneumonia on May 9, 1949. Dr. Turner McLardy reported as follows:

"The well-fixed brain showed no external abnormality beyond moderate anæmia. Examination of the orbital prefrontal regions revealed a leucotome entry slit 4 mm. broad in rostral parts of the middle orbital gyri in either hemisphere. The left one was centred 2·9 cm. from the midline; the right one 2·7 cm. from the midline. A transverse section of the left hemisphere perpendicular to gyrus rectus and 0·5 cm. posterior to the entry mark revealed a slit-like lesion of the same dimensions as the entry mark situated in the digital white matter of the inferior frontal gyrus, 1·8 cm. from the midline. A parallel section 7 mm. more posteriorly revealed a lesion of the same length, but now of 1 mm. cystic breadth, situated in the digital white matter of the middle frontal gyrus, 1·6 cm. from the midline. This lesion terminated some 3 mm. more posteriorly in the cortex of the superior frontal sulcus, at the level of the rostral tip of the genu corporis callosi, and 4 mm. rostral to the tip of the anterior horn of the lateral ventricle. The lesion on the right side was practically identical in position, extent, and dimensions, likewise remaining almost parallel to the midline and showing no macroscopical evidence of a sweep through the central white matter."

Case 2.—A woman, aged 34, with schizophrenia, underwent operation under thiopentone anæsthesia on Sept. 12, 1948. She was transferred to another hospital "not improved" 2 months later and died there of myocardial degeneration on March 20, 1949. Dr. R. M. Norman, of Stoke Park, Bristol, examined the leucotomy lesions and found much the same as did Dr. McLardy. There was a leucotome track extending 5 cm. in length towards the genu corporis callosi and parallel to the midline. On the right side there was no evidence of fanning out and the track showed a cystic breadth of 1–3 cm. On the left side there was a similar but broader track, reaching 8 mm. cystic breadth at 3 cm. depth. This was the nearest approach to fanning out.

As a result of his findings, Dr. Norman asked whether the frontal poles on being transfixed (at least on the right side) moved with the leucotome or if the fibres were compressed and not cut by the leucotome. The macroscopical appearances in both these cases suggest that something of this kind happened. Maxwell (1945) states that the elasticity of different brains varies. Operations on the cadaver may be misleading.

The evidence so far suggests that transorbital leucotomy does not sever the white fibres in the anterior prefrontal area as anticipated. In these circumstances it is difficult to understand the clinical improvements claimed as a result of this operation.

It seems that to cut the white matter of the prefrontal area by the transorbital route, a leucotome somewhat on the lines of the McGregor-Crumbie instrument will be necessary. This has the advantage of exerting pressure in the opposite direction while cutting and thereby prevents the brain moving with the leucotome.

CONCLUSION

In the present series of eight cases no definite clinical improvement followed transorbital leucotomy. The necropsies on the two patients who died of intercurrent disease showed that the operation had not achieved its purpose of cutting the white matter of the prefrontal areas. Though the transorbital approach to the prefrontal area is easy, the future of transorbital leucotomy depends on further modifications designed to ensure the greatest possible severance of white fibres in this area.

My thanks are due to Dr. K. C. Bailey, medical superintendent, for permission to undertake this work and for encouragement; Mr. H. E. Pearse, surgeon to the and Somerset Hospital, for surgical suggestions design of a modified leucotome; and Dr. S. R anæsthetics and help in various ways.

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PERFORATION OF INTESTINE FISH-BONE

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IT is remarkable, in view of the probable with which sharp indigestible foreign bodies are how seldom these appear to perforate the Macmanus[1] collected 95 cases from publishe and his own experience, nearly half of which to metallic objects; bones, mainly fish-bones, for the next largest group. He found that cæcal region was the site of perforation in thre of the cases and discussed the pathology and th fall in mortality in the present century.

Probably a considerable number of such cas reported, and it is partly with a view to the experience of other surgeons that I following case.

A man, aged 42, seen in consultation at his home, of a continuous pain of 24 hours' duration, with stabs, in the right iliac fossa. There had been abdominal pain, no true colic, no nausea, and no His appetite had been normal despite the pain. been no bowel or urinary abnormality.

He was very tender in the right iliac fossa, was well-marked muscle-guarding in that area. examination was completely negative. The te pulse-rate, and respiration-rate were all normal. was clean. It was clear that there was acute in within the peritoneal cavity, and acute appen provisionally diagnosed. The patient was admitted and operated on $1^1/_2$ hours later.

Operation.—The abdomen was approached thro iron incision carried into the rectus sheath. Whe toneum was incised, the peritoneal cavity in the fossa was found to be entirely obliterated by delicat adhesions. A finger was inserted and was pricked by something lying medial to the cæcum dissection showed this to be the point of a sle lying within the terminal ileum and projecting wall. After isolation of the area the point was grasp object pulled through the bowel wall, which was Appendicectomy was performed and the abdo without drainage. Convalescence was uneventf patient was discharged home on the twelfth po day.

The patient, closely questioned about the possil having swallowed anything such as a fish-bone, said ally that he could not remember ever having anything unusual at any time.

I am indebted to Prof. E. A. Spaul, of the d of zoology in the University of Leeds, for the report on the foreign body: "It appears to ray from a bony fish (cod, salmon, turbot, is very probably from the outer edge of one of possibly a dorsal fin—or from the tail, but n the former. These rays consist of proteins o keratin nature. It is possible that the fish wa preparation for the meal and the sharply po of the ray pierced the gut wall; otherwise t might have been more acute."

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Reviews of Books

ıl Malformations of the Heart

s B. Taussig, M.D., associate professor of pediatrics, Hopkins University. New York: Commonwealth London: Oxford University Press. 1947. 8. 55s.

Taussig is well recognised for her work on cya- t-disease. In this long and well-produced work. of congenital cardiac abnormalities are con- ı detail. Her detailed clinical observations and studies have greatly advanced the radiological ıion of these cases. Diagrams and radiograms the features of each condition. and helpful ıgrams demonstrate the circulatory alterations. little reference to kymography or cardioangio- though their recent development has been nspired by Dr. Taussig's work. But as she ıt, most of the diagnoses can be established on and radiological grounds. A short chapter surgical correction of some of the malformations. ıdes the principles and results of the operation the names of Blalock and Taussig. James classic little monograph on congenital cardiac ations does not seem to be mentioned in the s: but such minor criticisms apart there can ng but praise for the observation and knowledge d by the author of this book.

durch Hypnose

Lothar Fresacher, of Graz. Vienna: Maudrich.). Pp. 45. Sch. 6.

osis as a method of psychological treatment come associated almost exclusively with the ıal nervous disorders. Dr. Fresacher holds that y are the mentally healthy usually the best s for hypnosis but it can achieve its best results id to symptomatic treatment in chronic physical He also describes its use as the principal method oach to psychosomatic illnesses. The failure of is to substantiate the excessive claims made by f its exponents. as well as the discovery and ment of the psycho-analytic and related tech- has diverted medical men from this method, in f the striking results which are to be obtained in ases. Patience and continued practice are necessary the best results. and the case is put for the oment of medical hypnotism as a specialised not of psychotherapy but of medicine, and for reference to its use in the student curriculum. esacher's views on the indications for hypnosis ven in detail. and his description of its use in onditions as inoperable cancer, heart-disease. and c eczema, and as an analgesic in childbirth. are ılarly interesting. In conditions in which there ge psychogenic factor, such as impotence, nervous œa. and functional amenorrhœa. he advocates e of suggestion alone after full physical examination. echnique described is entirely orthodox and free theatricality, and in spite of his enthusiasm he s a sense of proportion towards his subject. His opathological views are open to criticism. but in he brings refreshing originality and common to this hackneyed subject.

s is a short readable book in which the arguments early expressed, and it will be of interest to the al physician seeking to take a wider view of his ct.

Mind in Action

ric Berne, M.D. London: John Lehmann. 1949. p. 348. 15s.

. Berne's book is rather more lively than the ntional exposition of psycho-analysis without ; but it is no more easy for the tough-minded ic to accept. Taking a leaf out of the allegorists' , he gives the characters in his case-histories signifi- names: Rex Bigfoot is in trouble with his Œdipus em; Wendell Meleager dreams frequently that he l his mother's brother: and others with names bscure as they are quaint—Ludwig Farbanti and Don Chusbac. Philly Porenza and Simon Seifuss—titillate the reader's curiosity as though he were reading a roman-à-clef. It is a pity that Dr. Berne has not been as explicit as his great forerunners: there was no doubt as to what Sir Epicure Mammon stood for, or Mr. Facing-Both-Ways. The book contains some practical advice. adapted for the English reader. on how to choose a doctor for nervous disorders; there is also a series of appendices on extrasensory perception, intuition (in which. from the example given. the author is evidently endowed much beyond the common run of mankind), and other such phenomena, as well as on "man as a political animal."

Le traitement des tumeurs malignes primitives du maxillaire supérieur

Marcel Dargent; Marcel Gignoux; Jean Gaillard. Paris: Masson. 1948. Pp. 216. Fr. 500.

The preface of this book is written by Prof. Leon Berard. who traces the history of the treatment of cancer of the maxilla. pointing out that it can be divided into two periods—before and after 1900. The first resection was performed by Gensoul at Lyons in 1827. Since 1900. operative technique, anæsthesia. irradiation, and antibiotics have altered the outlook for some of these patients. In the Anticancer Centre of Lyons the authors have treated a large series of cases. and they present a very complete study of this disease. They develop their theme logically. starting with the anatomy of the part and a detailed consideration of the malignant tumours of this region. The various methods of treatment are discussed. including all the types of surgical excision. electrocoagulation. irradiation, and combined surgical and irradiation treatments. The authors advise a block dissection of the regional lymph-nodes in the neck. as a prophylactic and therapeutic measure. Treatment in a series of 207 cases is reported, and they assess the results of palliative and radical treatments. relating them to the type of neoplasm present. Of 120 patients treated with a view to cure. using various methods. there were 24 survivors at five years (20%). Prostheses receive attention. and the good results obtained are shown in photographs. This is a complete and informative treatise on malignant tumours of the maxilla.

Obesity

Edward H. Rynearson, M.D., F.A.C.P., associate professor of medicine. Mayo Foundation; Clifford F. Gastineau, M.D., fellow in medicine at the foundation. Oxford: Blackwell Scientific Publications. 1949. Pp. 134. 17s. 6d.

This splendid little monograph on obesity contains some 422 references. and in addition advises the reader to read articles by four other authors—a kindly but unnecessary gesture. The book, as the preface explains, is more for the practising physician than for the investigator. A full chapter has been written on the ætiology of obesity. including its psychological and endocrine factors. Contra-indications to weight-reduction are discussed. A very full chapter on dieting is given, and this is rightly considered the most important therapy. though some drugs are mentioned. A method for predicting weight loss is described in detail. This excellent custom, commonly followed in America and rarely in this country, is a real factor in helping the patient to adhere to his dietary programme.

Die Angst des Kindes

Marguerite Loosli-Usteri. Berne: Huber. 1948. Pp. 164. Sw. fr. 15.

Dr. Loosli-Usteri. an educational psychologist on the staff of the Institut Jean Jacques Rousseau in Geneva, has here set herself to unravel the skein of anxiety which often torments the normal as well as the maladjusted child; she seeks also to examine the ways in which adults can help the child by means of education and psychotherapy in his struggle against anxiety. Further than this. she considers the positive function which fear fulfils. Dr. Loosli-Usteri believes that she is at variance with Freud in her view that anxiety is an irreducible datum of psychic life, but it seems doubtful whether she has grasped the development of psycho-analytic theory on this matter. She finds in Janet's observations on anxious adults a close correspondence to her findings in maladjusted children. She has used the children's spontaneous utterances, their play, drawings, fantasies, and remarks during an interview: she has also drawn on her exceptionally thorough experience with the Rorschach test, applied to children. Her book provides a valuable study of a fundamental problem in the psychology and psychotherapy of childhood, and has the merit of being free from complicated theoretical preconceptions.

La Fecondazione Artificiale nella Donna (Milano: Istituto La Casa. 1949. Pp. 100. L. 150).—In this booklet by Sebastiano di Francesco artificial insemination, whether A.I.H. or A.I.D., is utterly condemned on religious, ethical, psychological, and juristic grounds; and everything is said to be wicked that deviates in the slightest from the usual mode of coitus.

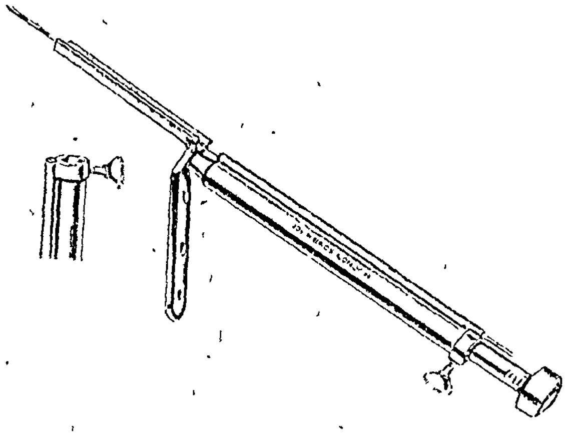
Medical Etymology (Philadelphia and London: W. B. Saunders. 1949. Pp. 263. 27*s.* 6*d.*).—Prof. O. H. Perry Pepper gives here the derivations of words used in medicine, under the separate headings of preclinical subjects (subdivided into anatomy, physiological chemistry, physiology, pathology, bacteriology, pharmacology and therapeutics, and parasitology), clinical subjects (subdivided into medicine, surgery, pædiatrics, neurology, gynæcology and obstetrics, ophthalmology, dermatology, otolaryngology, psychiatry, and radiology), and dentistry. It is difficult to see what is gained by this arrangement, which makes necessary the addition of an index of more than 25 pages. Eponyms, except for general remarks on them, are rightly disregarded in a work of this sort, which deals strictly with etymology and not with the present meanings of the words.

New Inventions

GUIDE IMPACTOR FOR USE WITH CAPENER-NEUFELD NAIL

INSERTING a nail plate (Capener-Neufeld pattern) for the treatment of a pertrochanteric fracture of the femur is not always easy, because the nail, not being cannulated cannot be inserted over a guide wire, as in an ordinary nailing operation. It is also difficult to make a nail plate so that the punch attached for insertion and the nail are in the same straight line. Usually the screw-hole for the attachment of the punch is about $^1/_4$ inch below the apex of the V of the nail.

The guide impactor here illustrated, which has been made by Messrs. Down Bros. and Mayer & Phelps Ltd., overcomes these difficulties and allows the nail plate to be inserted along a guide wire. The impactor consists of two tubes of different diameters welded together—a larger, corresponding to the diameter of the punch, and a smaller, the diameter of which is that of the guide wire. There is a fixation screw on the larger tube to attach the guide firmly to the punch.

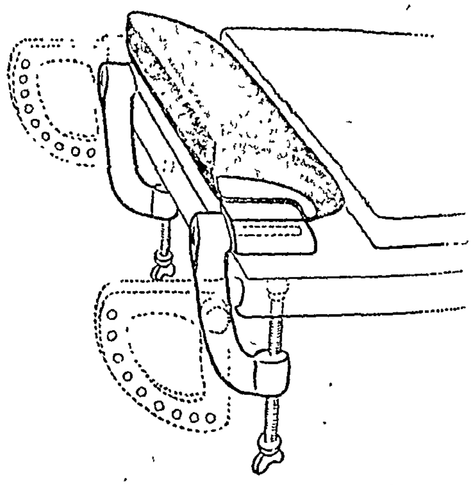


The guide wire is inserted in the usual way. The nail with punch attached and the guide in position is then slid on the guide wire. When the nail is being in, it is necessary to depress the punch towards to keep the point of the nail in contact with th wire.

Exeter. F. O. DURBIN,

SACRAL REST FOR USE IN SYNCHRO COMBINED EXCISION OF RECTUM

THE synchronous combined technique is method of choice in many centres for pe abdominoperineal excision of the rectum. An condition for the smooth conduct of this operation accurate fixation of the patient to the table lithotomy-Trendelenburg position by means of leg supports such as those devised by Lloyd which ensures for both abdominal and perineal o satisfactory access to their respective operation Particular importance attaches to the precise of the sacrum relative to the end of the table; it be so situated that the sacrococcygeal joint about an inch clear of the table—no more and no It is further customary to raise the sacrum on a m sized sandbag with the object of flattening the lumbar lordosis and tilting the pelvis upwards to the perineal dissection.



Several disadvantages, however, attach to the a sandbag for this purpose. First, it provides a sin hard support for the thinly covered sacral pro Secondly, unless special care is exercised it is lia be knocked off the table on to the floor as the pat pulled down into correct position before the start operation. And thirdly, even though the shoulde firmly supported it may slip slightly towards the end of the table when the patient is tipped into Trendelenburg position, which may confront the p operator with exceptional difficulties. Attempts the sandbag to the end of the table and counter latter two disadvantages have not been very succ and I believe that a better plan is to use a sp designed metal sacral rest such as that shown in accompanying figure.

This rest can be firmly fixed to the tail end of the by strong screw clamps so that it becomes insep from it for the duration of the operation and yet quickly detached when the operation is completed sloping convex surface is upholstered with 'S rubber and provides a comfortable bearing point f sacrum, while its distal edge is clear cut and sl overhanging, facilitating access to the perineal The rest has been used with satisfaction for over synchronous combined excisions at St. Mark's Ho where it is now regarded as part of the standard e ment for this operation. It was made to my specifi by Messrs. A. L. Hawkins & Co. Ltd., 15, New Cave Street, London, W.1.

J. C. GOLIGHER, CH.M. Edin., F.R.C.S.
Assistant Surgeon, St. Mary's Hospital and St. Hospital for Diseases of the Rectum, London

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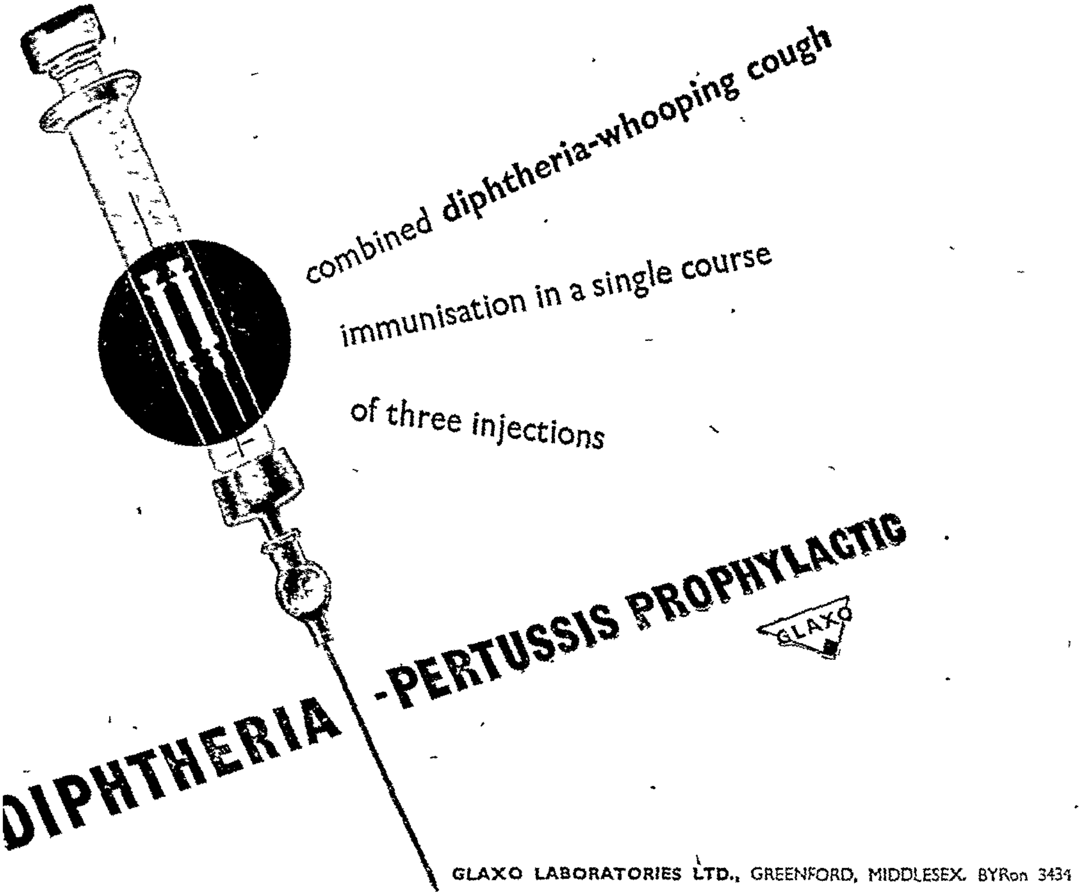
1. Lloyd-Davies, O. V. *Lancet*, 1939, ii, 74.



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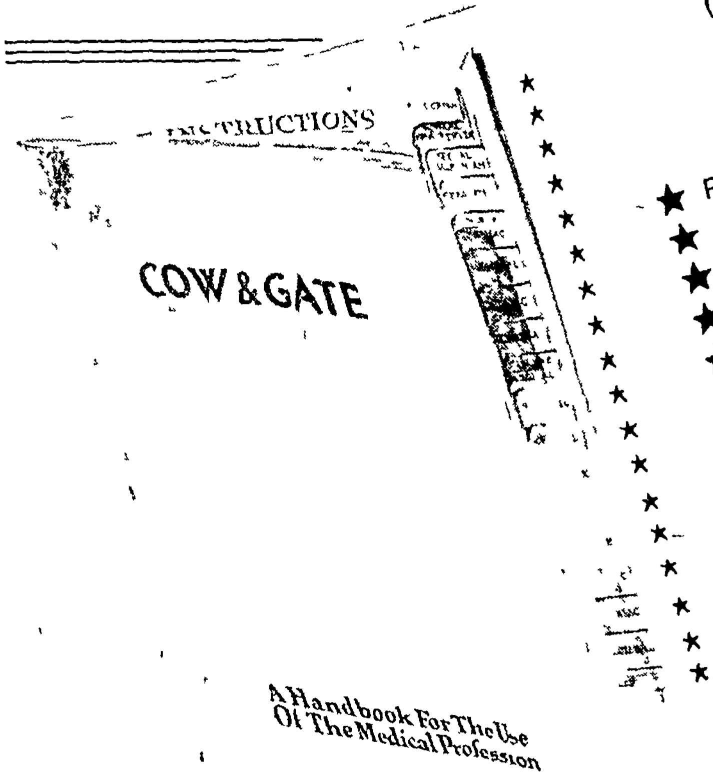

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THE LANCET

DON: SATURDAY, SEPT. 10, 1949

Employment of Elderly Persons

he signs of a civilised community is that it
me of its time and wealth to the proper
elderly members. This work has usually
unobtrusively by the elderly person's
d in general that holds true today, as
has shown in his survey of Wolverhampton.
has been a growing and understandable
t the State should intervene to an increasing
he housing shortage has made the accom-
of aged relations in their families' homes
cult than ever, while, with the shortage
ic help and the greater opportunities for
nt offered to those who would have cared
it has become harder for the elderly to lead
nt lives. In a reasonably stable world it
difficult to refuse more State help, but
esent economic stringency other questions
onsidered. To what extent can the State
give us all a comfortable retirement, and at
should this retirement begin? Under the
w men become eligible for pensions at 65
en at 60. The pension is small—26s. a week
made up of a 10s. old-age pension and a
ment pension. In cases of need the Assistance
n add another 11s. a week, making a total
n income on which only a somewhat austere
ssible. But, as Dr. Fagge points out on
page, if the elderly person decides to
h his work and earns more than £1 a week,
retirement pension is withheld until the age
hen the promise of an extra 1s. a week for each
y contributions paid a sufficient incentive?
Nuffield inquiry,[2] for instance, came the
n that he should receive a lump-sum pay-
ll the pension he has forgone. Many firms
workers retiring when they have reached
ble age, while other employers, including the
ire their employees at 60. The number of
aching pensionable age has risen from some
in 1900 to about 6,000.000 now, and since
every probability of this increase continuing
nated that by 1970 a fifth of the population
ntitled to a pension. The recent increase in
ol-leaving age has removed many potential
from among the younger age-groups, and
ced with the serious question of how long it
ossible for a diminishing number of workers
iddle period of life to support not only an
l number of their younger contemporaries
a steadily increasing number of their elders.
generally accepted, though difficult to prove,
increased expectation of life has been accom-
by an extended enjoyment of health and
vigour, and that among those of pensionable age and over there is a large reservoir of men and women who could still contribute substantially to the nation's wealth. But before discussing the economic implications of this presumption it is necessary to assess the health value of continued work. Those who have worked among elderly patients mostly agree that occupation, provided it is not in excess of their mental or physical powers, is good for the elderly. For example, at Basle it has been found that over 90% of elderly persons who are admitted to the cantonal hospital ask, after a few weeks, to be given work, and for these employment is found, up to their capacity, in the adjoining hospital, where they work as porters, lift-men, cleaners, menders, and so on. They are paid a small wage in addition to their pension, and improvement in their health and morale is the rule. The popularity of occupational therapy in institutions where aged persons are housed is evidence that some form of congenial activity is welcomed even by the very aged, while the medical results are striking. During the late war, when labour was scarce, a large number of elderly workers were retained in industry for several years after their usual retiring age, and reports showed that both the quality and quantity of their work were good, and that their health did not suffer. Since the war some firms have arranged to retain many of their elderly workers in employment, while an interesting experiment of this sort is about to start at Wolverhampton. In America similar experiments are being carried out in several industries, and evidence is accumulating to show that elderly people are often capable of being trained in new work. Useful research into such capacities of the aged is being done by Sir FREDERIC BARTLETT, F.R.S., at Cambridge. In the years between the wars, and before that, large-scale unemployment was endemic in this country, and the trade unions were anxious that the retirement of elderly workers should not be delayed, for they rightly argued that it was preferable for them to retire on pension than for younger workers to be supported by "doles."[2] But now, when the Government has announced its adherence to a policy of full employment, and so far has been successful in carrying out this policy, there is less need for the trade unions to adopt such restrictive practices. The detailed working of any scheme for employing the elderly is bound to be complicated, but with good will on both sides such questions as hours of work, payment, and the promotion of younger men and women should be solvable. Elderly workers will not all be fit to work a full 5 or $5^1/_2$ day week, and it need not be too difficult to arrange their conditions of employment satisfactorily. During the war a considerable amount of work (outwork) "was done by old people in their own homes, and at the beginning of 1944 no less than 30.000 outworkers, about half in the London area, were freeing full-time workers in factories for work which was best done in factories, or which could be better performed in factories."[3] The problem of work in homes, hostels, or hospitals has always been that of finding a market for the goods so made, but one or two successful experiments in marketing by a central body have been carried out, and this practice could well be extended.

J. H. The Social Medicine of Old Age. London, 1948.
ople. Report of a Nuffield survey committee under the
nanship of B. Seebohm Rowntree. London, 1947; p. 103.

[3] The Nation and the Aged: a Report of a Committee of Liberals to the Liberal Party Executive.

A recent survey by the Ministry of Labour shows that about 60% of all would-be pensioners continue to work after they have reached pensionable age, but this percentage includes agricultural and other country workers who are well known to go on working until an advanced age and does not state how long these workers continued at their employment, so the value of the survey is limited. It has been estimated that in a few years retirement pensions will cost the country about £500,000,000 a year in unproductive expenditure a sum which cannot be contemplated with equanimity in our present economic state. Nobody wants to reduce the pension rate, but are there the same objections to an increase in the length of working life? This latter alternative must be combined with the strict proviso that no-one of pensionable age shall be compelled to work if they do not wish to and that no employer shall be compelled to employ an elderly person whom he does not consider fit for work. The *Times* of Aug. 29 says: "there is no doubt that the movement towards earlier retirement ought not to be talked of for the time being and that all provisions affecting the employment of the elderly need to be reconsidered." When medical opinion is so closely paralleled by economic necessity, would it not best serve the interests of people of all ages to offer our younger pensioners stronger inducements to keep busy a little longer?

Whooping-cough: Prevention or Cure?

WITH the passing of the major pestilences—smallpox, typhus and plague, typhoid and cholera—from our country, more attention is rightly being given to control of the common childhood fevers. Of the four most important, scarlet fever is now a mild infection, diphtheria is being rapidly brought under control, and deaths from measles have declined sharply in the past quarter of a century. Whooping-cough has yielded least to ameliorating measures, and this protracted debilitating infection with its major incidence and mortality in early childhood is today the most challenging of the acute specific fevers. The evidence that whooping-cough is caused by *Hæmophilus pertussis*, of which all strains are apparently antigenically identical, and that a clinical attack confers considerable immunity, suggests that the disease could be prevented by a vaccine. However, though vaccines have been on the market for many years, there is still doubt and controversy about their prophylactic value. The first step forward was made in 1931, when LESLIE and GARDNER[1] showed that only smooth (phase 1) strains were protective experimentally; and a strong indication that a vaccine made from freshly isolated strains had some protective value was given by the experience in the Faroe Islands, where, in an epidemic year (1929), 25% of the inoculated escaped infection compared with 1·8% of the uninoculated, and infection was classified as moderate or severe in 46% of the uninoculated but in only 2% of the vaccinated group. American workers like SAUER and KENDRICK claimed greater success with larger doses (three or four weekly injections totalling 80,000–100,000 million organisms), but others reported failure.[2]

A difficulty in assessing the value of an
lactic or therapeutic agent is to provide a
untreated controls, identical, as far as is
possible, with the treated group. The first
of this kind in Britain, done on nursery c
a British vaccine, failed to show any protec
so, at the request of the Ministry of Health
Research Council committee organised
controlled trials in different areas of E
Wales, using both American and British
A preliminary statement on the progress of
is published on p. 476. It appears that in
groups of young children, totalling 4691
controls, in Oxford, Manchester, Leeds,
London area, the incidence and severity of
cough in the test groups were appreciably l
the control groups, and in the 7th trial
slightly more favourable in the test grou
was considerable variation in the prophylact
of the vaccines from different sources, t
for which are not clear, nor is there yet a
laboratory method by which the antigeni
of a vaccine can be effectively assayed.
however, that one particular type of v
decidedly better protection than the others
omen, since, if the method of preparati
vaccine is made known to other manufact
seems a good chance that effective vaccine
be generally obtainable. Straws in the win
of British vaccines are a report by MUMM
pertussis incidence of 32% (mostly mil
among 84 inoculated children intimately
the home to infection, compared with 90
similar group of uninoculated controls,
results obtained by HOLT[4] in Keighley whe
tion of 1000 preschool children apparently
a considerable degree of protection. Gre
also attaches to the possibility of combinin
vaccine with diphtheria toxoid. Two recent
BELL,[5] following up his admirably controll
gations in Norfolk, Virginia, indicated that
precipitated mixture of diphtheria toxoid
tussis vaccine, in two doses with 4 weeks
not only gave a better protection against
as measured by the Schick test, than did A
but also conferred substantial protectic
pertussis. The combined vaccine seemed
effective in infants aged 2–5 months a
children.

Meanwhile, the search goes on for a
whooping-cough, for which so many "cu
visits to the gas-works to aeroplane trips, ha
been advocated. The early hopes from sulp
and the antibiotics have not been fulfilled.
bronchopneumonia responds poorly to
amides or penicillin but better perhaps to str
Polymyxin (aerosporin), for which beneficia
aborting the infection has been claimed,
disappointing in an extensive trial by Ka
his colleagues.[6] There was no improvement
of 46 moderately or severely ill young chi
6 of the 12 who apparently responded were
their fourth week of illness. Half of a sma

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[1] Leslie, P. H., Gardner, A. D. *J. Hyg., Camb.* 1931, 31, 423.
[2] See Lewis, T. *Med. Offr*, 1946, 76, 5.
[3] Mummery, R. T. *Publ. Hlth, Lond.* 1948, 62, 28.
[4] Holt, H. M. *Med. Offr*, June 25, 1949, p. 265; July
[5] Bell, J. A. *J. Amer. med. Ass.* 1949, 137, 1009, 127
[6] Kaplan, S., Fischer, A. E., Kohn, J. L. *J. Pediat*

ive cultures continued to yield *H. pertussis* d after therapy. Toxic effects included ia in about half the cases and pyrexia with ion in most of those given the drug intra- r. The new antibiotics, chloromycetin and in, are both active in vitro against *H. pertussis.* w of their beneficial effect in such bacterial s enteric and undulant fever, it seemed test their therapeutic action in pertussis. others[7] found that aureomycin not only ut also prevented death in mice injected rally with many lethal doses of *H. pertussis,* e effective when given in small doses twice eight days than in larger doses for a shorter n a small group of 20 children with clinical treated at home with a total dosage of kg. body-weight, in divided doses over four ays, the results were distinctly encouraging. response was obtained in those treated in paroxysmal stage, which again emphasises e of early bacteriological diagnosis with or pernasal swabs.[8] Unpublished experi- ork suggests that chloromycetin, which is g manufactured synthetically in this country, ly effective against pertussis, and no doubt ities will be found for testing one, or both, drugs clinically during the coming winter. pects are bright, and perhaps within the ade whooping-cough will have ceased to rifying disease for the mothers of young

Diagnosis of Thyroid Disease

ACTIVE iodine is now being used for the of thyroid disease at several centres in this The tests are based on the facts that iodine ential part of the thyroxine molecule; that highly concentrated by the thyroid; and that id cannot distinguish between the common form (I^{127}) and its radioactive isotope (I^{131}). By ering a minute "tracer" dose of radio-iodine ortion taken up by the thyroid in unit time estimated. There are reasons for assuming proportion indicates the rate at which the is making thyroxine, and also that thyroxine e thyroid at the same rate as it is being made. rate of entry of radio-iodine into the thyroid s an index of the rate at which thyroxine is he thyroid.

ate at which radio-iodine is taken up by the can be measured in several different ways, ave already been reviewed in these columns.[9] the choice is between measuring the rate of of gamma rays by means of a Geiger counter ver the neck, and measuring the amount of ivity in the urine at intervals after adminis- of the radio-iodine. The first method gives ired information more directly; the second measuring the amount of radio-iodine which entered the thyroid and is therefore excreted rine. POCHIN and his colleagues[10] have refined the first method by simultaneously estimating the concentration of radio-iodine in a sample of plasma. By combining this estimate with the data obtained from the counter over the neck, they can calculate a "thyroid clearance-rate," which measures the rate at which the thyroid is removing radio-iodine from the plasma. This procedure is necessarily rather elaborate, but at a meeting of the Royal Society of Medicine in May MYANT and POCHIN suggested two possible variants which might be more suitable for routine work. One of these involves comparison of the counting-rates over neck and thigh an hour after a dose of radio-iodine; the other a single estimate of plasma radio-iodine two hours after administration by mouth. The urinary tests described in the present issue by two groups of workers are also technically simple but have the disadvantage of involving admission to hospital and the accurate collection of urine samples. Each of the existing techniques is capable of demonstrating large differences between normal subjects and typical cases of myxœdema on the one hand and of thyrotoxicosis on the other. To the clinician a really accurate and reliable estimate of the rate at which thyroxine is made would obviously be welcome. But this would not solve all diagnostic difficulties, and indeed it might create a new one: while some of the difficult "borderline" cases would be readily assigned to the normal or the abnormal group, a few would be likely to remain uncomfortably poised between the two. Statistically normal distributions do not have sharp upper and lower limits; at each end of the scale there are a few exceptional individuals who yet must be reckoned normal. On the other hand, there are very wide variations in the severity of thyrotoxicosis, and it seems a likely guess that the mildest cases will have no more active thyroids than a few exceptional normal persons; indeed such an overlap has already been demonstrated with radio-iodine, and its existence is probably no reflection on the technique adopted. There are other grounds for expecting a continuous gradation in thyroid activity, from the normal to the thyrotoxic, rather than a sharp separation into two distinct classes: for clinical experience suggests that patients can react very differently to comparable degrees of thyroid overactivity. The best example is the elderly woman with long-standing nodular goitre and auricular fibrillation; commonly no other sign of thyrotoxicosis is found and the basal metabolic-rate may be only slightly raised or even be wholly normal. In some cases of this type thyroid activity may turn out to be within normal limits. Yet if such patients are treated by subtotal thyroidectomy, regular heart-rhythm is usually restored. Thyroid activity may not have been excessive compared with that of normal people; but it was excessive for the particular patient.

Examples of this sort prove nothing, but they show that we should be wary of accepting the measurement of a single physiological function as an absolute criterion of disease. To have obtained a measure—even an indirect measure—of the rate of thyroxine production is a fine achievement, but until it becomes possible to measure also the subject's responsiveness to thyroxine there will still be a place for clinical judgment.

I. A., Pittman, M., Olson, B. J. *Publ. Hlth. Rep., Wash.* 9, 64, 589.

kshank, R. *Lancet*, 1949, i, 176. Cockburn, W. C., Holt, D. *Mon. Bull. Min. Hlth. P. H. L. S.* 1948, 7, 156.

ng article, *Lancet*, 1949, i, 528.

t, N. K., Pochin, E. E., Goldie, E. A. *Quart. J. Med.* 1948, 9.

Annotations

CHANGES IN GENERAL PRACTICE

IN a report to the Minister of Health the Medical Practices Committee for England and Wales has given an account of its stewardship during the first year of the National Health Service. From its favoured position the committee has been well placed to observe the change that is taking place in general practice, particularly as it affects the distribution of doctors. As the following extracts show, the committee is satisfied that a healthy change in distribution is already beginning and is likely to continue without any sanctions other than those imposed by the changed economic situation in districts which previously attracted more than their due share of practitioners.

> "The number of general practitioners in the service by July 5, 1948, was approximately, we understand, 20,000. There had in fact been about 2000 new entrants into general practice in the few months immediately prior to the appointed day. This increase was largely due to the impact of the Act and uncertainty in the minds of the profession. Some genuine concern at the possible activities of this committee was we believe a strong factor in the decision on the part of practitioners to attempt to settle a place of practice before the Act came into force. A natural reaction to this has been manifest during the past year. Some of these new entrants into practice have done well and have succeeded in establishing themselves. Not all were wise in their choice of location. Some of those who chose the more desirable residential regions have been obliged to contemplate and to seek transference to other areas or other employment. The same effect of economic circumstances though to a lesser degree has been noted with established practitioners. Since the appointed day in areas desirable from a residential point of view many retiring practitioners have not been replaced; the three-man practice may have become a two-man practice and the single practice dispersed."
>
> "What it is desired to emphasise is that the impact of the *Act itself and the economic circumstances of medical practice* which flow from it are already exercising an effect upon the distribution of general practitioners in England and Wales. This committee is in a favourable position to assess this movement which is in the direction desired and is being achieved without coercion by any statutory body."
>
> "Partnerships are multiplying and new practices are being started. Difficulty in obtaining suitable premises from which to conduct a practice alone prevents this process from being accelerated. Many assistants have become partners of or successors to their principals and the committee considers that preliminary apprenticeship as an assistant is still the best method of entry into general practice."
>
> "It became evident that in certain executive-council areas, or parts of them, it would be a waste of medical man-power to allow additions to the medical list of the executive council concerned for the purpose of practising in those parts and that such areas should be closed. In a few areas the position was less evident, and the committee felt a decision might well depend upon day to day circumstances and that these areas should be designated as 'doubtful.' The applicants to practise therein would be warned that the chance of establishing themselves in practice was likely to be difficult and that permission to make the attempt would not necessarily follow upon such application; the committee would act upon information before it at the time of the application and might then declare the area closed."
>
> "This committee has never opposed a desire that a replacement should be allowed for a doctor leaving any practice, whether the desire was expressed by an executive council, a practitioner himself, his partners, or occasionally on representations by outside bodies."
>
> "The committee has never refused admission to the list for the purpose of starting a practice against the advice of the executive council concerned or the local medical committee. The committee in carrying out its statutory duty has, however, been compelled to admit applicants to the medical list against the advice of some executive councils that they be refused."

The committee goes on to give some acc
way in which, in conjunction with executi
and local medical committees, it has devised
which vacancies in practices could be
committee re-emphasises that preliminary app
as an assistant is still the best method of ent
general practice. The death or retirement o
often necessitates the appointment of a suc
among those not previously practising in
When this has to be done it seems that:

> "In most cases now the executive council prepa
> list of the most suitable candidates and after
> those recommends the candidate for selection. Ev
> it might appear that the executive council has overl
> salient point in an application which might prove
> to be a decisive factor or has failed to give what the
> considers to be proper consideration, of the
> as a whole, the Medical Practices Committee
> recommended candidate."

In some cases the Medical Practices Committee
it expedient to interview candidates itself
doctors interviewed it says: "We have been
by the keenness of most of the applicants
noted that generally the competition is
practices in the southern part of the count
observation makes it a little more difficult
share the committee's own confidence that the
of distribution will in time all solve themselve

An appendix to the report gives the c
views on the classification of different pa
country into areas which should now be r
"closed," "doubtful," or "open." A fou
(a subdivision of this last section) might
classified as "wide-open," for in it are in
districts where the committee regards the p
more doctors as a matter of priority. The cl
of the various districts has already been
but the committee emphasises that its dec
not immutable.

An accompanying *circular from the* Ministry
upon executive councils the need for urgent
attract doctors to the "wide-open" areas. I
such steps as advertising for a specified r
doctors to set up practice, offering at the
an assurance of the fixed annual payment to
while they are establishing themselves. A gu
this payment will of course be a help to the
newcomer, but the executive councils may
that their best efforts to extend their se
frustrated by the difficulty of finding premise
for incoming doctors. It is in just such area
that the early provision of health centres w
been so useful.

MERCURY HAZARD TO THE POLI

FOR two thousand years cumulative poiso
mercury and lead have had a way of turning
guise of new hazards. In 1823, Purkinje, the
anatomist and physiologist, famous for his wo
cerebellar cortex and on vision, was the first
out that fingerprints could be accurately classi
suggestion that they should be used for perso
fication came much later. A fingerprint burea
up at New Scotland Yard in 1901, and now,
fingerprints are taken from the fingers of su
covering them with printer's ink and pressing
cards. Detection by fingerprints depends on
parison of such inked impressions with latent fi
found at the scene of the crime. Before the
photographed latent fingerprints are developed
dusted with a finely divided powder such as al
willow charcoal, acacia black, lamp black, or
graphite. White lead was at one time used,
tunately it has been discarded, for it has ca

in a policeman who worked with it. In Great
day perhaps 90% of all fingerprints developed
ed with our old friend "grey powder"—
rum cum creta *B.P.*—containing a third by
metallic mercury. It is not surprising that
spend their time, often in confined spaces,
attering such a powder about with a brush or
r should sooner or later show evidence of
nercurialism, and on p. 451 Dr. Agate and
kell report the finding of such evidence among
of the Lancashire Constabulary.

ive Chief Inspector C. Campbell, of that con-
, when looking for a more efficient fingerprint
consulted a scientist friend, who, on hearing
cury with chalk was being used, told him that
was dangerous and put him in touch with Dr.
Hunter's department for research in industrial
at the London Hospital. Agate and Buckell,
bers of the department, investigated matters on
and found that 7 out of a group of 32 Lancashire
n regularly using grey powder had symptoms
s of chronic mercury poisoning. Exposures of
s or more a year at this work appear to constitute
e risk. It is probable that exposures have not
ached this magnitude in other police forces, for
ire lays particular stress on the value of finger-
but other cases will almost certainly come to
Fortunately the poisoning in the cases reported
severe. Prevention should not be difficult, for
wder will now join white lead in the list of
too dangerous for this purpose, and substitutes
ng found. What thousands of years it takes to
me the fact that lead and mercury are cumulative
!

UNIVERSITY TRENDS

946 the Barlow Committee on Scientific Man-
called for doubling of the universities' output of
tes in science and technology. The country's
ic situation is such that the main hope of
g the present standard of living lies in the
ment by technical means of the limited resources
le on this island. Quite apart from national
rations, the medical profession has a vested
in advances in pure science, for each new tech-
r fresh conception of life or matter soon has its
ssions on medical practice. At the university
not disregard the leavening effect of students of
manities on the philosophy and ethics of our often
hnically minded profession.

esponse of the universities to this call for expan-
the post-war period can be gauged from the
account[1] by the University Grants Committee
academic year 1947–48. Since 1945 the student
tion of the British universities has risen by 57%
e pre-war figure—from 50,002 to 78,507. Quality
as quantity is of crucial importance, and the fact
f some 15,000 graduates last summer only 60%
n honours degree has excited some comment. It
en suggested that with the removal of economic
s to university education (80% of Oxford under-
tes are "assisted"), many have been admitted
her studies who are unable to profit from the
tion given. Beyond a certain point—say the
3% on the intelligence-test scale—saturation may
ckly reached and nothing further can be achieved
gets and exhortations.

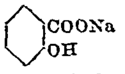
tever the truth of these qualitative surmises, the
itative pattern of post-war trends in university
ion is now clear. In 1947–48 the percentage distri-
of men and women full-time students over the various subject-groups was as follows: men, arts 39%, medicine 21·5%, pure science 19%, technology 16·7%, agriculture 3·8%; women, arts 62·7%, science 17%, medicine 16·4%, agriculture 2·4%, technology 1·5%. In recent years these proportions have been fairly stable. Compared with 1938–39, the arts faculties retain a remarkably constant proportion of the students (45%), but there seems to have been some shift from medicine and dentistry towards pure science which now engages 18·5% instead of 15·3% of the total. In absolute numbers the result of the drive towards scientific studies is even more striking: whereas students of medicine and dentistry have increased from 13,636 to 15,907, science students have increased from 7661 to 14,544.

Within medicine itself the distribution of these 15,907 students is interesting. While Scotland and Wales have 4157 and 326 students of medicine, London with 5844 accounts for more than half of England's total of 11,424. London differs too in its male/female ratio, which is 5 : 1 compared with 3 : 1 in other British universities.

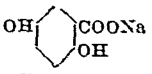
GENTISATE FOR SALICYLATE

The cause (or causes) of rheumatic fever is still undecided, though there is a vast mass of evidence relating it to infection with hæmolytic streptococci. The impressive success of Hench and his associates[1] in treating rheumatism with the cortical steroid, 'Cortisone,' suggests that in the future treatment will be directed to correcting associated metabolic disturbances. Meanwhile, we must make do with remedies that are to hand. Sodium salicylate usually controls the pain and swelling of rheumatic fever; but effective doses almost always produce the well-known toxic effects involving the gastro-intestinal tract and the special senses. It now seems that sodium gentisate is equally effective and produces few, if any, toxic effects.

In vitro, sodium salicylate inhibits the enzyme hyaluronidase, in very high concentrations, while the biological oxidation-product of salicylate, gentisic acid, does so[2 3] in a concentration of a few µg. per ml. In the belief that increased hyaluronidase activity might be responsible for the breakdown of interfibrillar cement in rheumatic disease, Meyer and Ragan[3] concluded that gentisic acid would be worthy of trial in rheumatic fever.



Sodium salicylate



Sodium gentisate

Their results were quite definite. In five patients with acute rheumatic fever sodium gentisate in doses similar to those of the salicylates led to disappearance of pain, swelling, and heat in the joints; a fall of temperature to normal; and a decrease in the blood-sedimentation rate. In one patient withdrawal of gentisate after 3 days' treatment was followed within 44 hours by a return of acute joint symptoms, which responded promptly to renewed administration of the drug. Four patients with persistently active rheumatic fever—so-called "chronic rheumatic fever"—responded equally well to salicylate and gentisate. The two drugs were also equally effective in seven patients with rheumatoid arthritis. In patients receiving as much as 10 grammes of the drug per day, Meyer and Ragan only once observed toxic manifestations—in a patient receiving 8 g. per day who developed some epigastric distress which subsided immediately on withdrawal of the gentisate. None of the patients complained even of tinnitus. One patient

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ersity Grants Committee: Returns from Universities and
iversity Colleges in Receipt of Treasury Grant for the
ademic Year 1947–48. H.M. Stationery Office. 1s. 6d.

1. Hench, P. S., Slocumb, C. H., Barnes, A. R., Smith, H. L., Polley, H. F., Kendall, E. C. *Proc. Mayo Clin.* 1949, 24, 277. See *Lancet*, July 23, p. 159.
2. Guerra, F. *J. Pharmacol.* 1946, 87, 193.
3. Meyer, K., Ragan, C., Weinshelbaum, H. *Fed. Proc.* 1948, 7, 173.

with a chronic duodenal ulcer could not tolerate salicylate, whereas gentisate caused no gastric irritation. Even more striking are the results of Camelin and his colleagues,[4] in France, who have administered up to 18 g. of sodium gentisate without producing toxic effects. They find that the drug does not lower the alkaline reserve and need not be given in combination with bicarbonate.

A SEARCH FOR FOSTER-HOMES

NEXT to adoption, the Curtis Committee[5] preferred boarding-out to any other method of providing a child with a substitute for its own home. They noted, however, some of the reasons why suitable foster-homes are scarce—among them, the dread parents have of becoming attached to a child who may afterwards be taken away, their dislike of interference from the child's own parents, their fear of inspection and criticism, and the small amount of the allowance. Miss Mary Maw, who has just published, under the auspices of the National Association for Mental Health, the results of an experimental search for foster-homes,[6] finds that most of these objections still stand. Her experience was gained in 1947 in a small municipal borough (population 90,000) and its surrounding villages in a rural and thinly populated county, and she compiled a central register of foster-homes. During the eighteen months spent on the experiment 30 children were placed through this register, which was used by voluntary bodies, the public-assistance committee, the health and education authorities, the child-guidance clinic, and the probation officers. At the end of the experiment the children's committee took over the register for the use of their newly appointed children's officer. The study added only 35 new foster-homes to those already in use; and this rather small bag is in itself significant of the unforeseen hazards of the chase.

Many people, it seems, would like to have a child—childless couples, parents who have lost an only child, those with an only child who needs a playmate, those whose children have grown up and left home, those who have had only boys and want a girl or vice versa, single women or widows (often living alone), and comfortable families who feel they could make another child welcome. But these prospective foster-parents much more commonly want to adopt a child than to accept one for boarding-out. Foster-children who have grown dear to their protectors may be removed. Sometimes their own mothers get posts in which they are able to keep them; sometimes a voluntary society responsible for the child may recall him at a given age to enter a training home or residential school. This practice, which has been the cause of much unhappiness, has recently been modified, she says. Only a few foster-parents can face a partial relationship with the child—those, she finds, who "by reason of their own stability and satisfactory adjustment, are able to regard the situation with detachment and refrain from a possessive attitude." Such good parents can give an "unaffected, uncritical, and ungrudging welcome" to visiting relatives; and are in fact more like wise grandparents who do not complicate the child's loyalties, but take him and his situation as they find them.

In most people, however, many unconscious anxieties prejudice the relationship. The foster-parents, romantically longing to pour love out on a child, may overwhelm him with their possessive affection. He rebels, and passes dramatically from the class of ewe lamb to that of serpent's tooth. Perhaps the child is illegitimate:
then every peccadillo may be hailed as the
a bad heredity. Perhaps there is guilt
natural mother deprived of her child: the
feels she has stolen the baby. Perhaps t
parents, unconsciously ashamed of their own
fertility, doubt their capacity for successfu
hood; then, if self-blame is displaced, the chil
the scapegoat. Perhaps the couple, anxious
their only child with a companion, hav
a child of the same age; then the
jealousy between the two children will lead t
fighting.

Nevertheless, when all these drawbacks are
owned, it remains true that many children
good foster-care, and a search for appropri
homes is never wasted labour. As Miss M
"it is not necessarily the most intelligent
happy, warm-hearted people, not afraid of
warm feelings, who make the best foster-
people, that is, who not only feel affection bu
gift of persevering in it.

STANDARDISATION OF CARDIAC OU

THE introduction of measurement in clinica
always leads to broad advances in the parti
Mathematicians and philosophers realise that
of measurement is ever completely accura
biological work we think ourselves fortunate i
has a standard error of less than 5%. Cr
they may be, blood-counting and sphygmo
led to enormous progress in medicine, but it
time before the demand for greater detail r
closer critical examination of the accuracy a
of the techniques and of the significance
standards. The introduction of methods for t
mate measurement of cardiac output in ma
led to a clearer understanding of what goes o
vascular disease, but these advances have
with only the most elementary attention
standards.

It is widely accepted, as a result of studi
cardiac catheter, that the cardiac output o
recumbent resting man is about 5–5½ litres pe
This figure, however, may be considerably
excitement causing acceleration of the heart-r
the patient is not in a strictly basal condition
to double this value may readily be e
Tanner[3] has tried to improve accuracy by
normal data obtained by three different te
(1) the ballistocardiogram,[4] which allows cal
the cardiac output by measurement of the
of blood ejected into the aorta with each
(2) cardiac catheterisation; and (3) the
method.[5] By the last technique cardiac
calculated from the rate of uptake of inhale
as blood passes through the lungs: this metho
has now been discarded because of inaccurac
it produced some interesting results and reve
trends before more accurate methods were
Tanner has shown that there is a reasonable
between the cardiac-output figures obtain
ballistocardiogram and by catheterisation. H
the validity of some methods of expressing r
America it is usual to express cardiac output i
square metre of body surface.[2] [5] Tanner poin
this ratio may lead to error, since the equati
these two measurements may not, in fact, give
line passing through the zero point of an ordin

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[4] Camelin, A., Accoyer, P., Pellerat, J. Lafuma, J., Coirault, R. *Bull. Soc. méd. Hôp. Paris*, 1949, 65, 826.

[5] Report of the Care of Children Committee. H.M. Stationery Office, 1946.

[6] Finding Foster Homes, Obtainable from the association 39, Queen Anne Street, London, W.1. Pp. 31. 1s.

[1] McMichael, J., Sharpey-Schafer, E. P. *Brit. Heart J*

[2] Cournand, A., Riley, R. L., Breed, E. S., Bald Richards, D. S. *J. clin. Invest.* 1945, 24, 106.

[3] Tanner, J. M. *Ibid*, 1949, 28, 567.

[4] Starr, I., Schroeder, H. A. *Ibid*, 1940, 19, 437.

[5] Grollman, A. The Cardiac Output in Man in Health Springfield, Ill., 1932.

be necessary to construct a very complicated equations relating cardiac output or stroke ot only to measurements of body size but to -rate, and other important factors. Tanner nay be important to establish standards, since cardiac output may be early indications is *something the matter with the heart.* It at Starr[6] has demonstrated abnormalities in ocardiogram in patients who later developed rt-disease, but other methods of estimating tput do not yield any such early diagnostic or indications.[7]

fficult to imagine that standard conditions for the cardiac output will be easily achieved in linary clinical diagnostic investigation or in

It is impossible, for example, to achieve basal in cardiac dyspnœa or indeed in conscious ıman subjects who are undergoing complicated investigations. For this reason there is some- be said for the usual method adopted in this of simply expressing cardiac output in the ure obtained under the conditions in which the ons were made.[1] An approach along the lines by Tanner will no doubt be of great importance uture date. Now, however, as Tanner admits, available from the various techniques are rather for the establishment of satisfactory standards. too little of the way in which various factors ge, heart-rate, venous filling pressure, and so uence the output of the heart. Clearly these nfluences will have to be taken into account time comes for the creation of standards and e" values.

HE MEDICAL COLLEGE AT BAGDAD

great days of Arabian medicine, Rhazes and taught and practised in Bagdad, and Bach- s paid a salary of some £300 a year for bleeding ing the immortal Haroun-al-Raschid. But, as an says in a report to the committee of manage- the Examining Board in England, the lights when the Mongols sacked Bagdad in 1258, and lighted again until after the 1914–18 war, q ceased to be a backward province of Turkey me an independent country. Lord Moran has iting Iraq on behalf of the board to advise on our Royal Colleges should recognise the Royal of Medicine, Bagdad. His report shows a school full of promise but hampered by the lack ersity, and by the difficulty of attracting good o teaching. Most of the doctors qualifying practise in Bagdad, where rewards are highest, not anxious to work either in the country or in the basic sciences. The cure for this ism (which, Lord Moran reminds us, is by no onfined to Iraq) is to be found, he believes, in y standards and the university spirit.

g 1948–49 there were 296 men and 39 women at the Medical College of Bagdad. About nts now enter yearly, but the wastage is very f 605 students admitted to the school between d 1942, only 212 (35%) graduated; and at only about 40 qualify yearly. The population is 4,500,000, and the number of doctors now on ister 528. If a standard of 1 doctor to 3000 is to be achieved, another 1000 doctors are

One cause of the heavy wastage is the low d of education in the secondary schools, and ese become more efficient the best hope lies in selection of students. At present the medical accepts the Iraq secondary school certificate; but it would be better, Lord Moran thinks, to require prospective medical students to pass a matriculation test conducted by the college itself.

Many of the medical school buildings are modern and well adapted to their purpose, but some need improving. According to law, every newly qualified doctor must serve as a resident for two years: but in practice there are only 15 vacancies for some 40 graduates, and those who fail to get one either join the Army or go into private practice. Some 5 or 6 of the successful 15 are chosen to specialise at the end of their term of office, and to these a ladder of training is open. They become second grade tutors for three years, while working for their M.D. or M.S. If they fail to get one of these higher qualifications they leave and go into practice. Those who succeed become first-grade tutors for three years and must take a specialist examination; on passing this they become assistant-professors, and after eight years' teaching in this rank, if their contributions to medical journals are worthy, they become associate professors. In this office they await a vacancy to be elected professor.

Looking at the work of the college all round, and taking account of the difficulties of the situation in Iraq, Lord Moran recommended the committee of management to advise the Royal Colleges to recognise the medical school at Bagdad for a year; and this the committee has done.

PHYSIOTHERAPY SERVICE

A CIRCULAR issued by the Ministry of Health to hospital authorities indicates the lines on which the provision of physiotherapy should be organised. The circular states:

> "The Minister is advised that the maximum benefit of modern physiotherapy is to be obtained under specialist supervision in fully staffed and equipped hospital departments. Furthermore, the shortage of adequately trained personnel, which will continue for an indefinite period, makes it imperative to concentrate them in hospital departments where their services can be employed to most advantage. Accordingly, physiotherapy in the National Health Service should be provided only under specialist prescription as part of the hospital and specialist service, and responsibility should be accepted by regional boards only for treatment prescribed by hospital specialists and carried out under their supervision. General practitioners who consider that their patients require physiotherapy will normally refer them to a hospital. . . ."

The system formerly in use in some rural areas of contracting with public organisations or with private physiotherapists is to be discontinued and replaced by full-time or part-time clinics in suitable towns or villages, conducted by physiotherapists based on the nearest hospital with an adequate physiotherapy department. These clinics will make use of existing halls or other suitable buildings. Physiotherapists now in private practice may be offered full-time or part-time contracts in the hospital service. Hospitals are asked to give careful consideration to the possibility of appointing blind physiotherapists to vacancies on the staff of hospital departments and associated clinics, particularly any situated near the blind physiotherapist's home.

Evening clinics are to be organised to save loss of time to patients who need treatment though still at work (said to number some 10–15% of the total). Domiciliary treatment will be provided only exceptionally; and hospitals will accept responsibility for such treatment only when it has been prescribed by a specialist.

DR. F. T. REES has been appointed director-general of medical services of the Ministry of Pensions in succession to Sir Francis Prideaux who retires on Sept. 20.

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1. *Amer. J. med. Sci.* 1947, 214, 233.

, E. A. jun., Warren, J. V., Brannon, E. S. *Amer. Heart J.* , 35, 529.

Special Articles

WHOOPING-COUGH PROPHYLAXIS

PRELIMINARY STATEMENT BY THE WHOOPING-COUGH IMMUNISATION COMMITTEE, MEDICAL RESEARCH COUNCIL

In view of the conflicting reports on the efficacy of pertussis vaccine in whooping-cough prophylaxis, the Medical Research Council was asked by the Ministry of Health to investigate the problem and report on the value of prophylactic immunisation against whooping-cough of children in England and Wales.

As part of the investigation, the Whooping-Cough Immunisation Committee organised a series of controlled field trials in which the experience of children inoculated with pertussis vaccine could be compared with that of control children. The results of some of the early trials have already been published.[1] The evidence obtained suggested that the pertussis vaccine used in these trials was of no value in whooping-cough prophylaxis.

Further large-scale trials have now been carried out in collaboration with the medical officers of health of Oxford, Manchester, Tottenham, Wembley, Edmonton, Leeds, and West Ham, using a number of different vaccines of both British and American origin.

METHOD

Each trial was planned in a similar manner. Children, mostly between the ages of 6 and 18 months, whose parents agreed that they should take part, were divided by the method of random sampling into two groups. The children in one group—the test group—were inoculated with the pertussis vaccine under trial, while those in the other group—the control group—were inoculated with an "anti-catarrhal" vaccine containing no *Hæmophilus pertussis*. After inoculation the children in both groups were kept under close observation for at least two years, by monthly home visits made by specially appointed nurse-visitors. Those children who came into known contact with whooping-cough or who developed symptoms which might be those of early whooping-cough received special visits in order that a bacteriological diagnosis might be made. Since it was essential that observers should not be influenced in their clinical assessment of the disease, efforts were made to ensure that neither the doctor, the nurse-visitor, nor the parents should know whether the child under observation was in the test or the control group.

RESULTS

Seven of the early trials, comprising a total of 4691 test and control children, have now been in progress for over two years, and from a preliminary analysis of the results the following general conclusions may be drawn:

1. In each trial the random allocation to test and control produced two equivalent groups of children, comparable in age, sex, duration of breast-feeding, size of family, and incidence of infections other than whooping-cough.

2. In six of the trials the incidence and severity of whooping-cough in the test groups were appreciably less than in the control groups. In the seventh trial the results in the test group were only slightly more favourable.

3. There was considerable variation in the prophylactic potency of vaccines from different sources, and there was probably also some variation in the potency of different batches of vaccine from the same source.

4. One particular type of vaccine, not at present readily available, was found to give decidedly better protection against the disease than any of the others tested.

FURTHER INVESTIGATIONS

The reason for variations in the prophyla
of these vaccines is not clear, nor is there
a conclusive laboratory method of assay b
property of a vaccine can be accurately asse
investigation is in progress in which the
value in children of a number of different vac
compared with their immunising properties
laboratory tests. With this aim in view,
already been begun in Manchester, Oxf
Poole, Walthamstow, and Leyton.

No investigation has so far been made of
combined pertussis-diphtheria prophylactic
considered desirable to avoid the inclusion
that might complicate the issue and to do
might possibly harm the diphtheria imm
paign at a stage when the true value of
immunisation was unknown.

This preliminary statement has been
account of the interest shown by health auth
outcome of these investigations. A detaile
now being made and should be ready fo
early in 1950.

Members of the committee and the medical of
concerned wish to record their gratitude to the m
of parents who have collaborated and are still c
the investigation, and who, when control grou
essential, have volunteered to take part in the
that their children would not necessarily rec
vaccine.

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1. McFarlan, A. M., Topley, E., Fisher, M. *Brit. med. J.* 1945, ii, 205.

"PURIFICATION" OF VACCINE

Douglas McClean
M.B. Lond.
BACTERIOLOGIST I/C VACCINE LYMPH DEP
LISTER INSTITUTE OF PREVENTIVE ME
ELSTREE, HERTS

Reports from European and American
indicate that the action of phenol in
bacterial contamination of crude vaccine
the preparation of vaccine lymph is not gen
Some of these papers describe the treat
vaccinifer, or the vaccinial material, wi
tyrothrycin, or formalin (Gernez et al. 194
Nélis and Lafontaine 1948, Sevin et al. 1
advocate spraying the vaccinated surface o
harvested pulp with a detergent antiseptic
The writers imply that the only altern
methods of "purification" they desc
slow "maturation" of the lymph in
of glycerol with or without the additi
cloves.

None of the methods described gives
satisfactory results. In our experience a
'Roccal' (a quarternary ammonium dete
same composition as 'Zephiran') is adde
pulp it acts as a bacteriostatic rather than
agent; subsequent cultures made in a m
neutralises the residual roccal in the lym
high concentration of viable organisms.
used to spray the vaccinated area during t
period it reduces the yield of virus.

USE OF PHENOL

Phenol has been used since 1941 as a routi
at Elstree to obtain the rapid "purification
lymph, and it was also used by the Govern
Establishment from about the same dat
ceased production. At no time has the
indication that vaccine lymph issued with
centration of about 0·4% phenol deteri
rapidly than similar material *without this*

re any evidence that treatment of the crude lp with 1% phenol causes material destruction s.

1941, I believe, the Government Lymph nent had relied on the slow destruction of ting organisms by storage with glycerol and es. At Elstree we had for many years treated s of crude pulp with a stream of warm sterilised ed with chloroform vapour. This method was out involved two or three exposures of an to the vapour on successive days and caused reduction of viral potency; further, the m solution had to be "blown off" by a sterile air until a negative isocyanide test ned before the lymph could be glycerinated, and issued. The whole process, including nimals for potency, took about three weeks date of trituration of the crude pulp. During nge of information on methods with the nt Lymph Establishment in 1939, Lieut.- . D. H. Stevenson, then director, informed me had obtained encouraging preliminary results nol; we confirmed their results and by 1941 ed the method described below as a routine .

METHOD

uitable grinding machine x grammes of crude ulp is triturated with $2x$ ml. of 1% phenol in tilled water. The resulting mixture is incubated for 48 hours, and the bacterial examinations by the Therapeutic Substances Regulations are de. During this examination the vaccinial is stored at ± 4°C; it should not be stored C before the glycerol is added, since freezing occulation of the suspended matter. If the terial-count is higher than is desirable, or if gnisable non-sporing pathogens are still present, erial is returned to the 22°C incubator for a 24 hours, which is almost invariably sufficient ce a satisfactory result.

l at a concentration of 1% does not destroy poring organisms or anaerobes such as *Cl. tetani.* ious colonies or organisms of this type are seen re they must be individually examined, and ence of *B. anthracis* and *Cl. tetani* excluded by l tests. On the other hand, phenol destroys olytic streptococci and *Bact. coli*; staphylo- e destroyed more slowly. The Therapeutic ces Regulations now in force permit the issue ine lymph containing not more than 20,000 as per ml. after the exclusion of recognisable ns; at Elstree no lymph is passed that contains an 5000 organisms per ml., and indeed, most contain considerably less than 1000. Moreover, storage before issue there is always a further tial destruction of organisms.

the bacteriological examination is satisfactory, of glycerol is added to the pulp-phenol mixture; e final concentration of phenol is about 0·4%. the lymph is passed through a sterilised wire-mesh gauge 32) with aseptic precautions before it is in bulk below −10°C.

cy tests are carried out by scarification on the back of a white-skinned rabbit; twofold dilutions : 1000 to 1 : 16,000 are tested, and it is usual in confluent or semiconfluent lesions up to and g the higher dilution. Two dilutions of a labora- andard lymph of known potency are included very batch of tests. These potency tests are d at least once after the lymph is dispensed pillary tubes or other containers for issue. The ication" and bacteriological and potency tests necessary, be done in fourteen days.

SUMMARY

The routine use of phenol to obtain the rapid reduction of the bacterial contamination of vaccine lymph is described.

The procedure is extremely simple, and lymph so treated can be issued for vaccination a fortnight from the date of trituration of the crude vaccine pulp.

The quarternary ammonium detergent roccal, used either as a spray on the vaccinated area or in the treatment of the ground vaccine pulp, acts as a bacteriostatic rather than a bactericidal agent. It is therefore less suitable than phenol.

Note.—Since submitting this note for publication I have learnt that Gins (1924) and Lehmann (1937) recommended the use of phenol in the purification of vaccine lymph, and that Stevenson and Butler (1939) stated that 0·5% phenol could be used to prevent accidental contamination of vaccinia cultivated in the embryonated egg. It is nevertheless still true that the use of phenol in the routine preparation of vaccine lymph is not generally known.

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A STATE PRACTICE IN SWEDISH LAPLAND

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D.M. Oxfd, M.R.C.P.

MEDICAL practice in Swedish Lapland has many features which contrast strongly with practice in most parts of England. Yet the general similarity of plan makes the contrasting details worth studying.

Sweden is divided into 500 medical districts, under the supervision of 24 regional doctors. Each of these districts, most of which have a population of about 5000, is in the charge of a State doctor. In most areas there are also private practitioners, but in remote places where the population is widely scattered and difficult of access, few private doctors are to be found; in Vilhelmina, the village in Swedish Lapland where I spent a fascinating week, there are none.

The organisation of a State practice is as follows. Doctors receive their salaries from the State. Their houses are provided by the community, the building costs being paid partly by government grant and partly from local rates. A small rent is charged for the part of the house used solely for personal purposes. The house in which I stayed, built in 1946–47, has, for professional purposes, a separate entrance leading to a small waiting lobby, off which is the nurse's room, where patients' names and particulars are taken. Beyond is the doctor's room with a small darkroom leading out of it, and a good-sized examination room excellently equipped for minor surgery. The writing-table, chairs, and other furniture are provided by the community; but couch, instruments, and all medical equipment are the doctor's property. The private accommodation consists of 2 living-rooms, a sizeable hall and landing leading on to a big balcony, and 4 bedrooms with labour-saving devices.

Two State doctors have charge of the district of Vilhelmina; each is responsible for an area of about

3800 sq. km. A woman doctor has charge of the wild, scattered, northern part, while a man takes care of the southern which includes the village of Vilhelmina; since his area is the more compact he is more accessible and so has charge of the hospital. When one of these two is away, the other cares for everyone in both districts and in the hospital. Patients from both areas can consult either doctor, and they do so freely; but owing to the immense distances neither doctor visits outside his or her area.

PAYMENTS

Doctors are paid a fixed annual salary, which varies inversely with the population of the district, because each patient pays a fee every time he visits either the outpatient department or the doctor's surgery; there are no booked accounts. The State fixes an upper and lower limit of fees, and the doctor is left to decide the amount which shall be paid within these limits. When patients are unable to afford a fee the doctor is paid by the community, or by the sick club if the patient is insured.

Patients pay for all drugs, which are obtained on prescription from the surgery or from the outpatient department; doctors do no dispensing. To patients in poor circumstances insulin and liver extract are issued free. Liquid paraffin, aspirin, and so on need no prescription and can be bought as desired. Prescriptions for iron, and those containing less than 15 mg. of barbiturate per dose can be used repeatedly by patients at their own discretion for six months after issue; thereafter a fresh prescription must be obtained. All other prescriptions can be marked "to be repeated once, twice, or thrice." The government exerts some control over the price of drugs and the composition of proprietary preparations. Inpatients receive all drugs and treatment free, but normally pay a small fee for board and lodging; when this is beyond the patient's means it is paid by the community. In the small district hospitals there are no private rooms. Anyone needing penicillin is almost invariably admitted since in this widely scattered district daily visits by nurse or doctor are out of the question.

The hospital at Vilhelmina is a well-equipped modern building planned for 18 general and 6 maternity cases, with some extra rooms reserved for emergencies or infectious cases. During the winter these extra rooms are brought into general use, and extra beds are put up in the wards, the number of patients often rising to as many as 30. An X-ray plant is operated by the district doctors, but cases needing elaborate technique—for example, gastro-intestinal investigations—have to be sent to Umea, 250 km. away. This can be reached by train; but some patients are sent by car, the cost being borne by the sick club or by the community if the patient is badly off and not covered by insurance. A simple outpatient department is equipped for general work and for such specialties as ear, nose and throat, and eye work, all of which are undertaken by the district doctors. Both doctors do all the operations for the district; anæsthetics are given by the nurses. Only cases needing specialised team-work are sent to Umea; serious emergencies are transported free by military plane.

A certain amount of emergency dental work is done by both doctors, but a new dental clinic is shortly to be opened and a resident dental surgeon has already been appointed. In this clinic there will also be accommodation for maternity and child-welfare work, which is now done at the doctors' surgeries. A tuberculosis dispensary serving several districts is under the care of a tuberculosis officer, who is responsible for organising sanatorium treatment when necessary. When he is on holiday artificial pneumothoraces are done by the State doctors at the district hospital.

NURSING

Visits are not paid to anything like the sa
as in England; after the first visit, much adv
by telephone. Visits may involve very
journeys, culminating as often as not in
through the forests or over lonely mountai
a map and compass are the doctor's vade
supply of emergency drugs is carried, but o
are usually posted from Vilhelmina. Very full
are given at the time of the visit, and supe
be left to the nurse, who often accompanies
on these long journeys.

Nursing is done by five trained nurses and
wives. Two midwives and one nurse live and w
village of Vilhelmina, using hired cars when
two other nurses, who live in the village, have
cars and attend to patients in the surrounding
while a further two nurses and two midwiv
mountain villages in the north and south dist
their work on foot and with the help of local
work of the nurses in the village is much the sa
of our district nurses, but the others have dutie
preventive type, infant welfare and general
forming a great part of their work. They a
stitches, open boils, and treat other minor tro
saving the doctors many a long journey. A g
can act as an invaluable "sorting office," deci
a call by the doctor is necessary.

In a district such as Vilhelmina a State doct
a person of many parts; great self-reliance
capabilities are indispensable. On paper ap
these posts must have done 8 months' p
work, but actually doctors are seldom appoin
they have had 5–6 years' practical experience
special departments of hospital. Some exp
district work, such as can be obtained fro
duties, is also necessary. Private practice is no
as *giving suitable experience.*

Employees who are injured while at work, w
the government or for a private employer, a
to a weekly benefit. To secure this, a certific
be obtained from the doctor only at the be
end of incapacity, no intermediate forms being
Hitherto insurance against illness has been ob
voluntary contributions to sick clubs, apart fro
ment employees who are compulsorily insure
State scheme. After 1950, however, everyo
obliged to join a sick club. In towns doctors are
to give fortnightly certificates, but in the cou
the interval is left to the discretion of the do
usually issues two only, as in the case of acci

THE DOCTOR'S STATUS

When the amount of paper work done by
Sweden is compared with that done by an Engl
with his weekly certificates and his endless re
scriptions, it is clear that our Swedish colle
spared an *enormous amount of clerking,* whi
their hands free for genuine medical work. Thu
use is made of their expensive training, of their
experience, and of their initiative and personal
relationship between doctor and patient is one
consideration and respect; doctors are held
esteem, and the idea of going to a doctor to
prescription "as of a right" never comes into th

Dare it be whispered that the Swedish a
appear to have greater trust in the common
integrity of both patient and doctor than has
evinced in England since 1911 when the S
concerned itself with general practice? The
attitude has produced a State scheme agreeable
and doctor alike. The doctor is free to make
his knowledge and craft for their proper pu
prevention, detection, and treatment of disease

BRITISH ASSOCIATION

ADOLESCENT NUTRITION

opening session of the physiology section of
h Association for the Advancement of Science,
stle-on-Tyne last week, Prof. R. A. PETERS,
sident of the section, observed that much had
ten and said about adult nutrition, but very
ut adolescent nutrition.

. C. SPENCE said that while physiologists had
much, the practical application of their work
ed smaller than they had hoped. Nevertheless
he physiological advances had been assimilated,
result the nation had been fed infinitely better
te war than in that of 1914–18. Perhaps this
e evident in a large industrial city like New-
an in other places which had not suffered so
etween the wars.

s and infant-mortality were good indicators
ss. In Newcastle the infant-mortality, which was
00 in 1927, had fallen to 38 per 1000 in 1948.
rickets—a still more delicate indicator—was
a severe form in 5% and in a slight form in 16%,
it had virtually disappeared and the student
alk the wards without seeing a single case.
urrounding villages there was no difficulty in
he 40-year-old bow-legged miner; but his son
ight-legged, tall, and healthy.

our groups most liable to suffer from poor
. were the young infant, the rapidly growing
it, the sacrificing mother, and the solitary old
he rapidly growing adolescent was in a transi-
eriod during which he was under neither the
of a mother nor the supervision of a wife. He
n nomadic, knowing little about values and less
utrition, anxious to learn the technique of his
t caring little what milk was and still less what
d pasture.

sor Spence decried "the tyranny of the norm,"
ved that the onset of adolescence or pubescence
cur at any age between $10^{1}/_{2}$ and $16^{1}/_{2}$, and that
reflected in the enormous variations in the diet
tage. At 16 a boy or girl might still be a child,
maturity-age was preferable to the chronological
orking out dietetic needs. Children in this age-
ere, judged by mortality-rates, peculiarly liable
culosis—girls at first more than boys, though
death-rate among boys overtook that of girls.
adolescents attacked by xerophthalmia, though
had been deficient for more than a year, the
deficiency was brought out only after extra
—usually 4–6 weeks in a coalmine.

vey of 1000 Newcastle families representing a
tion of the local community had shown that the
ies of preparing food in houses which were
as bad as any in England, was overcome by
estic good sense of the mother.

DIET AT SCHOOL AND UNIVERSITY

. L. SCOTT, medical officer of Christ's Hospital,
d the diets and the nutritional state of his
y dressed schoolboys in the two post-war periods.
ved that his 800 boys were a good cross-section
lower and middle classes, particularly as there
upper income-limit beyond which entry was
These boys of 9–19 years were placed in junior
until 11 years and thereafter in houses of fifty.
ding, which had always been central, had greatly
ed. Boys were weighed at the beginning, middle,
l of term. Quite often it was found that those in
ular house were not up to the average; and this
be traced to an unjudicious captain's putting his
undue physical strain. Yet the over-all picture was that of greatly increased height and weight. This increase must be due to some factor in the school régime, and he believed that this was dietetics. At one time the consumption of bread was 19 oz. per day and now it was down to 10 oz. Dr. G. E. Friend had been responsible for increasing the milk allocation from 7–10 oz. a day before the 1914–18 war to about 1 pint a day between the wars and during the late war. The boys had not suffered through the loss of fresh meat, which had to some extent been made good by corned beef, tinned meat, and fish.

During a month's survey of one house of fifty boys, he had found that they supplemented their diet, on average, to the extent of 250–300 calories—mostly in the form of carbohydrates. Like Professor Spence, he emphasised that a hungry boy would not necessarily eat anything put before him: potatoes especially were often refused, and the refusal of a particular dish often spread more quickly than an epidemic. The schoolboy must be understood if his needs were to be satisfied.

Dr. R. PASSMORE, speaking of his experience among undergraduates at Edinburgh, said that some of the senior members of the university were complacent, using the argument that what had been good enough for them was good enough today. The mid-term holiday was still called "meal Monday," and some undergraduates still celebrated it by returning to the croft to bring back their sack of oatmeal. Probably they needed it, for their only extra allowance was $^{1}/_{3}$ oz. of national milk cocoa a day. Yet a considerable proportion of undergraduates were still growing.

A dietary survey had shown that some undergraduates were eating little more than 2000 calories, whereas others were eating up to 4500; and there was a good deal of bartering of rations, particularly cheese. He wondered whether the apparently greedy eaters needed this extra compared with the small eaters, or, as he put it, whether some individuals could do more miles to the gallon than others.

Statistics showed that undergraduates ran an increased risk of tuberculosis. The primary cause of bad feeding was ignorance, supported by national tradition; and medical students were often no more enlightened than others. Of the students, 10% had less than 3 oz. of fruit and fresh vegetables daily. The landlady, he had found, was often more efficient than the mother; and this was almost invariably so when the student came from a broken home.

Dr. Passmore ended by speaking in support of a resolution by university medical officers, that every university should provide an adequate midday meal for non-residents.

HEALTH HAZARDS

Dr. R. E. SMITH, medical officer of Rugby School, discussed the stresses and strains of life, believing that they could be withstood more easily by the well-nourished child. The boys at his school were better nourished than the average in the community. Early-morning school, which put an unnecessary strain on the adolescent boy, was abolished in 1935. He quoted the incidence of fractures at Christ's Hospital and at Rugby and showed that in the years before the war fractures were slightly more common than during the war.

Certain diseases, particularly measles and whooping-cough, had a completely different symptomology in the well-nourished child. The principal difference was the almost complete absence of catarrhal symptoms; yet in measles the temperature chart was often identical with that for the child with catarrh, who might later contract complications such as otitis media, bronchitis, and bronchopneumonia. He also quoted figures showing that the bowel which had not been insulted regularly with aperients, laxatives, or purgatives threw off infection, particularly Sonne dysentery, in a surprisingly rapid way. The skin, if healthily sunburnt and kept in good condition, was able to tackle chickenpox and even measles more satisfactorily; and the eyes of a well-nourished child did not readily develop squints or an increase of refractive error. Moderation in eating was necessary lest acidosis and acne should appear. While acknowledging the experimental work indicating that the healthy monkey was more prone to infantile paralysis than one fed with insufficient vitamin B, he believed that the real factor involved was the amount of exertion.

FIRST INTERNATIONAL CONGRESS OF BIOCHEMISTRY

The first International Congress of Biochemistry, held in Cambridge from Aug. 19 to 25, was attended by over 1700 members from 42 different countries. In his opening address, Prof. A. C. Chibnall, F.R.S., the president, while looking to the future, laid an emphasis on the past most salutary for workers in a young science surging forward under the drive of new conceptions and techniques. The members of the congress were welcomed on behalf of the Government by Viscount Addison, Lord Privy Seal, and on behalf of the university by the Vice-Chancellor.

The congress, which was initiated by the Biochemical Society, met a need which had been felt for some while. Indeed, eight congresses had previously been organised by the Société de Chimie biologique, and to this body the president expressed the appreciation of all biochemists. The occasion was singularly appropriate for paying tribute to the memory of Gowland Hopkins. This beloved and revered man founded the Cambridge school of biochemists, and through his own work and that of his collaborators and pupils strongly influenced the development of biochemistry throughout the world. All three speakers in the opening session spoke of his work and personality, and a copy of a commemoration volume[1] containing his autobiography, selections of his writings, and appreciations of his character and influence, was given to each member of the congress.

On Aug. 20, the university marked the occasion by conferring the honorary degree of doctor of science on Lord Addison, Sir Charles Harington, Prof. C. F. Cori (U.S.A.), Prof. K. Linderstrøm-Lang (Denmark), Prof. A. W. K. Tiselius (Sweden), and Prof. J. Tréfouël (France). During the week, congress lectures were given by Professor Cori on Influence of Hormones on Enzymatic Reactions, by Prof. M. Florkin (Belgium) on Biochemical Aspects of Some Biological Concepts and by Sir Robert Robinson, F.R.S., on Tryptophan and its Structural Relatives.

THE SECTIONS

The communications were given *in twelve sections*, and their names show the wide range of subjects covered: I, animal nutrition and general metabolism; II, microbiological chemistry; III, enzymes and tissue metabolism; IV, proteins; V, clinical biochemistry; VI, structure and synthesis of biologically important substances; VII, cytochemistry; VIII, biological pigments—oxygen carriers and oxidising catalysts; IX, hormones and steroids; X, chemotherapy and immunochemistry; XI, plant biochemistry; and XII, industrial fermentations. In all, over 500 communications were presented to the congress, of which the following had special medical interest.

Section I

G. R. Cameron, describing histological and morphological changes in human liver damage, opened a session
on diet and liver injury. L. E. Glynn su
work with H. P. Himsworth on liver dama
dietary deficiencies in laboratory animals, str
difference between necrotic and cirrhotic ty
studies may ultimately throw light on human liv
In another meeting E. M. Widdowson repo
unexpectedly, German orphan children di
well on bread from flours of high and low
and equally well with and without milk, if
provided abundant calories. J. Dawson a
Holdsworth have found that with high
dosage a part of the increased serum-calciu
diffusible non-ionised form, probably due to the
of an ether-soluble substance, which they c
A crowded meeting heard from British and
workers, including K. Folkers, E. Les
M. S. Shorb, and W. F. Cuthbertson,
isolation, properties, and assay of the anti-
anæmia factor, vitamin B_{12}, and the possib
production from bacterial sources for clinical

Section II

P. C. Lichstein (U.S.A.) reported that a c
be obtained from yeast which contains biotin
of the B group) and which activates the bacter
deaminating aspartic acid. This complex i
identical with the prosthetic group of th
L. D. Wright and his fellow workers (U.S.A.
a crystalline biotin complex from yeast w
properties. In a session on enzyme form
adaptation, F. Bernheim (U.S.A.) state
avirulent, but not in virulent, tubercle organis
in presence of benzoic acid, enzymes oxi
substance appear—a process inhibited by str
M. R. P. Pollock and S. D. Wainwright s
the pencillinase of *B. cereus* is an adapti
but can be produced if the organism is tr
penicillin, washed, and grown for 7–8 gen
penicillin-free media. This may accord with
of P. D. Cooper and D. Rowley that radi
is fixed by bacteria. The character of th
differs in sensitive and non-sensitive orga
Mitchell and J. M. Moyle find that in *Sta*
disorganisation of purine nucleotide metabo
from the moment of addition of penicillin.

Section III

D. Richter and R. M. C. Dawson descr
changes in lactate, phosphate ester, and ac
levels in rat brain accompanying emotional
and sleep. M. P. Hele has studied phospho
sugars in vitro by the enzyme hexokinase in
mucosa. Her results are consistent with
that hexokinase is involved in sugar absorptio
gut. C. Lutwak-Mann reported that suble
of mustard-gas and X rays cause similar char
constitution and metabolism of the bon
H. Borsook (U.S.A.) has used the isotope
to study incorporation of amino-acids into th
of cell fragments. During a session on ac
metabolism, D. Nachmansohn (U.S.A.) dis
enzymic synthesis of a substance with the
logical properties of acetylcholine but chemic
different. R. A. McCance, A. O. Hutchinson
Dean, and P. E. H. Jones showed that in pu
not in infants, there is a phenomenal rise
cholinesterase level 3 days after birth, apparen
absorption of the enzyme from the colostrum.

Section IV

Great interest was aroused by the claim of A
(U.S.A.) that antibody-antigen and enzyme
interactions can occur when the antibody (or
is separated from the antigen (or substrate) by a
chloride "screen," so that long-range force
work. C. Weibull (Sweden) gave evidence

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[1] Hopkins and Biochemistry. Editors: Joseph Needham, F.R.S., and Ernest Baldwin, PH.D. Cambridge, 1949.

bacteria consist of single proteins. F. SANGER ·lly determining the sequence of the amino- ·the peptide chains of insulin ; one day this may be synthesised. S. MOORE and W. H. .S.A.), using starch chromatograms, can do a quantitative amino-acid analysis on 5 mg. of

)ENT and G. A. ROSE stated that in cystinuria ı low renal threshold for cystine and certain ino-acids, rather than a failure of the tissues se cystine. D. ADLERSBERG and colleagues consider that hereditary hypercholesterol- ı error of metabolism, is an important factor nesis of coronary atherosclerosis in xanthoma and also in coronary artery disease in relatively tients. A. C. FRAZER and others have observed achlorhydria or hypochlorhydria, and bacterial extending up the small intestine into the S. VAN CREVELD (Netherlands) described of hypersensitivity to vitamin D in a child. eriments of R. A. MCCANCE on water excretion nourished Germans provoked keen discussion.

VI

HEMS described a new synthesis of natural ine and J. LEGGETT BAILEY a new simple s of peptides. O. KAMM (U.S.A.) gave an account tructure and synthesis of the antibiotic chloro- , and of the purification and properties of the etic hormone of the posterior pituitary.

VII

were spirited sessions on mitotic poisons, tion of cell constituents, nucleic acids and roteins, enzymes and nucleic acid, lipids, and mical methods. J. S. MITCHELL reported clini- ls of large doses of tetra-sodium 2-methyl-1 : hohydroquinone diphosphate, mainly in con- ı with palliative X-ray therapy. The drug a small but useful improvement in the results atter in some cases of advanced cancer, a small in survival-time in inoperable carcinoma of the ıs, and retrogession of tumour cells in certain f adenocarcinoma. P. MANDEL and colleagues) stated that during protein starvation there was loss of ribonucleic acid in liver and muscle whereas oxyribonucleic acid was unaffected. Others ed the constancy of the latter in the cell. NTRENNE (Belgium) considered that cytoplasmic s are not divisible into large granules and micro- but form a continuous gradation in size. The t contain most ribonucleic acid, the largest the enzyme activities.

-VIII

e were valuable discussions on the structure of lobin, hæm-containing enzymes, cytochromes, and tabolism of porphyrins and bile pigments. C. G. ERG and C. B. LAURELL (Sweden) have isolated copper-containing protein, " caeruloplasmin," lood-serum. G. WALD (U.S.A.) described new ments in the biochemistry of rod vision ; sin is bleached by light to give retinene$_1$ (vitamin hyde) ; the latter is then reduced to vitamin A$_1$ enzyme retinene reductase, with reduced cozymase ızyme.

IX

. SOMERVILLE and G. F. MARRIAN described what parently a priming effect of progesterone on nediol production in postmenopausal women. TTSTEIN and C. MEYSTRE (Switzerland) reported 11-dehydro-progesterone has three times the tational activity of progesterone. P. M. COTES, ID, and F. G. YOUNG have found that pure growth hormone is diabetogenic in adult cats; they emphasised species and strain differences. S. BERGSTROM (Sweden) has isolated *l*-noradrenaline from adrenals. R. PITT-RIVERS gave a masterly review of antithyroid substances. C. H. LI (U.S.A.) has found that peptide fragments, containing on the average 7 amino-acid residues, obtained by hydrolysis of adrenocorticotrophic hormone, are more active than the hormone itself.

Section X

In a session on drugs and enzymes in chemotherapy B. A. FRY stated that the bactericidal triphenylmethane dyes inhibit glutamine synthesis in extracts of staphylococci, and E. D. WILLS that suramin inhibits several enzymes. E. CRUZ-COKE and M. PLAZA DE LOS REYES (Chile) found that tricresyl phosphate, which has anti-vitamin-E action, retards or arrests the growth of sarcoma implants in rats. In another session the question of the relative importance of the carbohydrate and nitrogenous parts of antigens was discussed and the need for new techniques of purification became clear. In a meeting on drug-resistance P. D'ARCY HART stressed the danger of development of streptomycin-resistant human tubercle organisms, and suggested the administration with streptomycin of a drug such as *p*-aminosalicylic acid which does not readily give rise to resistant bacteria. It was mentioned that M. MACHEBOEUF (France) has made organisms resistant by contact with extracts of a resistant strain. P. SCHAEFFER (France) described a type of resistance to streptomycin in which the latter becomes a growth factor for the resistant strain. A. BISHOP has produced resistant malaria parasites by subcurative doses of proguanil or sulphadiazine in infected birds. In a meeting on immunology P. GRABAR (France) urged that antibody production should not be regarded as a specific protective mechanism against infection but as an example of a physiological process in which globulins act as carriers for metabolic products. M. HEIDELBERGER (U.S.A.) suggested that carbohydrate antigens, unlike protein antigens, persist in the body for a long time. No theory of the antibody-antigen reaction received the support of all present.

CONCLUSIONS

All agreed that the congress was a success. The glorious weather, the lovely setting of university, college, and town will leave a lasting impression on those who took part. The value of a congress does not lie solely in its scientific sessions ; and in little informal gatherings and parties, as well as at the receptions and dinners, biochemists from many lands met to exchange ideas, to resolve differences of opinion, and to strengthen old friendships and initiate new. Speaker after speaker at the closing session emphasised in happy phrase the easy coöperation and agreement between members from different countries ; and one feels it was not only the common aim, but also appreciation of a deeper significance, which drew all together in amity.

This readiness to agree is exemplified by the working of an ad hoc international committee which met during the congress under the chairmanship of Sir CHARLES HARINGTON, F.R.S. This committee put forward the following resolutions :

1. That the invitation of the Société de Chimie biologique for the holding of the next international congress of biochemistry in Paris in 1952 be accepted with gratitude.

2. That an international committee for biochemistry be now set up and that it have the following composition (here followed the names of Sir Charles Harington, chairman, and of 20 representatives from all parts of the world) and that this committee be empowered to coöpt additional members from other countries as may be desirable.

3. That this committee be instructed to approach the International Council of Scientific Unions with a request for recognition as the international body representative o

biochemistry, with a view to the formal constitution of an International Union of Biochemistry, as soon as possible.

These resolutions were unanimously adopted by the congress at the closing session. So the congress ended on a note of international collaboration achieved, with a promise of even greater coöperation in the future. Professor Chibnall is retiring from the chair of biochemistry at Cambridge, and it must give him great pleasure that his tenure should have ended with his presidency of this happy and successful gathering. The congress has emphasised the dignity and independence of biochemistry as a discipline. Once merely on the borderlines between older sciences, it now forms a focus at which biochemists and workers in other sciences, old and new, meet for the solution of problems of common interest and the promotion of the health and happiness of mankind.

Public Health

REORGANISATION OF THE HEALTH SERVICES IN THE BRITISH ZONE OF GERMANY

WILFRID G. HARDING
M.R.C.S., D.P.H.
HON. LIEUT.-COLONEL, R.A.M.C.; LATE PUBLIC-HEALTH OFFICER, RUHR DISTRICT, BRITISH ZONE

AMONG the many tasks in Germany which faced the public-health branch of Military Government, and later of the Control Commission, reorganisation of the health services was probably the most urgent, and the most difficult. The condition of country and people made an efficient health administration more essential than ever, and direct administration by the Allied staff—a small group of public-health officers most of whom did not speak German—was impossible for any length of time.

UNDER THE NAZIS

When the National Socialist government came into power in 1933, they decided to retain most of the civil servants. The civil service had enjoyed for many generations a unique reputation in the country, and the new government realised that the large conservative element within the service could be relied on to support the nationalistic tendencies of the new régime, while its efficiency would suffer severely if there were many changes of staff. However, all active supporters of other political parties, as well as all Jews and most non-Aryans, were dismissed, and those suspected to be not wholly in favour of National Socialism were transferred to posts of little responsibility, and their promotion blocked. To replace those dismissed, loyal Nazis were appointed, often regardless of the fact that they did not possess the necessary qualifications. The service was to be recruited in future only from pro-Nazis, and arrangements were made for the intimidation, indoctrination, supervision, and control of non-Nazis retained in it.

For about a hundred years the public-health services had been run directly by the central government. Rumsey (1856) describes their organisation very much as we found it existing in 1945.

The authority deciding on policy and appointments was the ministry of home affairs of the Land concerned. In Prussia the Land ministries were amalgamated with those of the Reich in 1933, and the public-health service was thenceforward the responsibility of the Reichministerium des Innern. It was administered through provincial (Provinz) and regional district (Regierungsbezirk) headquarters by medical officers who were responsible for the local public-health organisation, for the inspection of hospital, sanitary, and pharmaceutical services, and for the professional nursing examinations.

The local administrative unit was and
the Kreis, of which there are two types—the
(county borough with population from 50,000
and the Landkreis (county or rural district wi
tion varying from 20,000 to 250,000). The
medical officer of health at these levels is the
who is the head of the local public-health
(Gesundheitsamt). From 1933 these appoin
made by the minister of home affairs, and the
was responsible to him through the interm
described above.

The Nazi party also ran its own health se
function it was to ensure that the people's
safeguarded and promoted according to part
and the best interests of the State. This o
was entirely separate from the State public-heal
and at Kreis and higher levels there were s
health offices with a hierarchy of "health
(Gesundheitsführer).

Thus the local public-health service was
under strict central control; there was also
check on its doctrinaire reliability at all leve
Amtsarzt was a trusted Nazi, and especially
been newly appointed in 1933 because of his pa
he might also hold the post of Gesundheitsführ
on the other hand, his qualifications for the
merely professional, where he was only a M
("March violet" was the nickname given to
joined the party in March, 1933, just after
accession to power), or possibly not even a par
at all (a rare occurrence, possible only in a f
districts, and nowhere after 1937), he was c
all times that he was being watched not o
Gestapo for his general political reliability, b
the party health organisation for the loyal e
his public-health tasks in accordance with Na
In October, 1937, public servants who had
members before were given a last chance
the party, and this was seized by alm
them.

Thus the majority of German public-healt
trators were willing tools of the party, with a f
of ardent Nazis among them, and only very fe
to maintain some independence in their outlo
in any case, they were never able to translate i

AFTER THE OCCUPATION

The technical instructions issued by SHAE
the public-health officers of Military Gover
down simply that

> "as permitted by the military organisatio
> scribed policy, the maximum degree to which
> of established health organisation and servic
> affected will measure the success of operations.
> furnishing of medical services should be by
> personnel. . . ."

When the Allied troops occupied an area t
always found that the public-health staff,
most other public servants, had abandoned t
and that there was no "established health o
to be utilised." Some local doctor might be
as an emergency public-health executive and to
the local medical services. But the reorgan
a proper public-health organisation had g
start from scratch. Meanwhile the local co
often unable even to consult an Allied hygienis
weeks, carried a heavy responsibility. Tha
early days no great health disaster occurred i
devastation such as the Ruhr is due in larg
to the efforts of these men who had to be m
constable, and city engineer, as well as medi
of health and sanitary inspector.

The central authority on which the se
depended had disappeared altogether, and for

he Provinz was to be the highest administra-
There were four provinces: Nordrhein (the
lf of the former Rheinprovinz, the southern
been split off and taken into the French zone)
ldorf as its capital, Westfalen (Münster),
Hannover), and Schleswig-Holstein (Kiel).
with a tradition of independence going back
le Ages, of which it had been deprived by the
also given provincial status. In September,
hein and Westfalen were amalgamated, and
1947, all provinces were given governmental
Länder with their own parliaments and

ritish side there was a parallel organisation,
m July, 1946, by a civilian regional com-
The German services came under the control
l public-health officer, with a staff consisting
ore hygienists, a nursing officer, and welfare,
l sanitary officers. Under the regional officer
e British public-health officers administered
rungsbezirk assisted by similar staffs. But
nts were never filled, and the British super-
nisation suffered all along from a persistent
of staffs.

German side we required a competent and
r directing staff for each province, with
l regional medical officers at the Regierungs-
l a good Amtsarzt in each Kreis. Enough
sperienced and qualified men could easily
drawn from the residents in the British zone
ny refugees from the East; but selection on
competence alone was not possible owing to
ication rules which had been agreed upon by
ccupying Powers.

PROBLEMS OF DENAZIFICATION

arate requirements had to be met: (1) the
the occupation troops had to be safeguarded
ention of politically dangerous elements; and
d militaristic influences were to be eliminated
c life.

requirement was to be met by the detention
ent camps of men and women who might be
s dangerous fanatics. They were, as a rule,
for detention on the grounds of having held
ks in the party organisation or in the civil
heir cases were to be investigated individually
date, and many relatively harmless unfortu-
to wait for a year or even longer before they
ed.

the second requirement all those holding a
t or wishing to be considered for employment
"vetted." Each had to fill in a questionary,
some 175 questions, which was later scrutin-
ublic-safety officers of Military Government.
tely these officers had, as a rule, little back-
owledge of German affairs, and the original
eding out convinced Nazis by the criteria of
nembership and party rank was soon found to

In some areas and departments much greater
ad been exerted on public servants to join the
y and to take part in its activities than in
o sort out these trends in one's own district
lt enough, but how was one to deal with the
ials who had been transferred at some stage
reer from elsewhere, or with newcomers now
for employment, among them many refugees
East about whom no inquiries could be made
former location? German denazification
rmed initially to advise the public-safety
d charged later to make their own decisions,
n accused of personal bias and even of
.

A special complication, moreover, affected the medical profession. In the same way in which the British doctor is given a commission as soon as he joins the Forces, many a German doctor had been given relatively high rank in the party organisation by virtue of his appointment as medical officer to one of its formations. This was rarely taken into consideration by the Allied security authorities who had been given definite instructions on the valuation of membership and rank, and whose discretionary powers were strictly limited. Thus one could find in the internment camps as large a proportion as 1 doctor to 50 other inmates—a rate about fifteen times higher than that of doctors in the general population. Similarly a large proportion of the medical profession had held party rank which now put them into the compulsory removal category. No one seriously believed that there had been more fanatic Nazis among the doctors than in any other profession, but no official recognition was given to their special position. It was ruled, it is true, that the general practitioner was not to be considered to hold public office and was therefore not to be subject to denazification procedure, but hospital staffs. and of course medical administrators, were to be denazified under the general regulations.

A further complication was the fact that almost all public-health officials had, in the course of their duties, been concerned in eugenic sterilisation, according to Nazi legislation. Public Health Branch ruled after consultation with British legal experts that if such activities had been strictly within the laws then in force they were not to be considered as disqualifying Nazi activities, but often indignation of the local population caused difficulty, and it was almost impossible to judge in retrospect the merits of any particular case.

Finally, difficulty arose out of the antimilitaristic clauses of the denazification regulations, which denied public office to all who had held regular commissions in the Fighting Services, as well as to temporary officers of field and higher rank. This paradoxically affected many—among them a number of hygienists—who in order to avoid membership of the party had elected as the only possible alternative to join the Wehrmacht, which, especially in the earlier years of the new rule, was considered relatively isolated from Nazi influence.

The British public-health officer charged with the re-establishment of an efficient service was thus faced with an insoluble problem. Most of the senior members of the old service had been removed to camps, and practically all other members of public-health staffs were ineligible according to the denazification rules. Our only chance was to invoke the risks which the prolonged disruption of the health services would cause—risks which would affect occupiers no less than occupied. On those grounds it was often possible by local compromise to retain and re-employ medical officers who to us appeared relatively harmless politically. But this solution was not generally recognised and depended entirely on the good will of the responsible public-safety officer. Moreover it was invariably agreed to as provisional only, and thus perpetuated a feeling of insecurity in the holder of the post, who was often subjected to open attack by fellow Germans, and even more often to whispering campaigns and denunciation.

If competent men were disqualified on their party records, so equally had some incompetent men been put into office on the grounds of their past record of persecution by the Nazis. Such men usually had considerable political backing and it would have been almost impossible for the Occupying Power to cause the removal of a proved anti-Nazi, however incompetent. It also became regrettably obvious that religious and political factions were trying to sponsor appointments in the public services, and, despite the object lesson they had been given during the preceding twelve years, they professed not to understand the Occupying Power's rejection of a staffing policy conducted according to religious and political allegiances.

STAFFING THE POST-WAR SERVICE

Nazi policy and our denazification procedure resulted in a shortage of staff, and in a regrettably mediocre standard of those who were left to hold office. Of those who had stood out in pre-Nazi days, the younger men had often been liquidated or had gone abroad, and only a few old men remained, hardly fit to adapt themselves, after many years in retirement, to the tremendous post-war tasks. Most of the efficient men of the Nazi era were now unemployable. Thus, at a time when initiative and drive were essential, the administration was largely in the hands of men who were too old, or who were second-raters, most of them constantly worried that their conditional employment might yet be terminated. At a time when decisions were required on fresh problems arising out of the post-war situation, these officials appeared tied down by obsolete regulations and laws. Discretionary power when given to them was rarely used; our direct orders were welcomed. Typical of this attitude was a remark made by the German chief medical officer of my own regional district, quoted by Count Bernadotte (1949). He had had 30 years' service in the German public-health administration; yet, when I told him that we were abandoning direct control and that he would now be responsible for his own department, he replied quite shocked: "But Herr Major, it is you who must command."

The same attitude prevented the recognition and out-of-turn promotion of young men of outstanding ability. In one instance I insisted on the transfer of a brilliant 36-year-old Amtsarzt from an unimportant rural district to a much more difficult district in the Ruhr. His political record was exceptionally clean; in fact he must have schemed with considerable ingenuity how to avoid joining the party. His record of service was excellent. Yet his superiors, including the head of the German regional administration did everything to dissuade me from my project, for one reason only—namely that every previous holder of his new post had been over 55 years old when appointed to it.

The German chief medical officers of each province, and later of each Land, constituted an advisory committee which met once a month at zonal public-health headquarters. The preparation of legislation to replace the German public-health law of 1935 was one of their most important tasks, for after the formation of the autonomous Länder health legislation was to be delegated to each Land, and it was therefore essential to agree on uniformity in all essentials before these laws were enacted. Similar committees dealt with nursing and pharmaceutical questions.

One of the early results of their discussions was the resumption of postgraduate public-health teaching. The two hygiene academies in Hamburg and Düsseldorf began 12-month courses in 1946, each for 35 students, and in view of the shortage of hygienists selected candidates with practical experience were also admitted to intensive 3-month courses.

RETURN OF RESPONSIBILITY TO THE GERMAN AUTHORITIES

In January, 1947, the new Länder were constituted, and direct control of public health reverted to the Germans, though a small British staff remained for liaison and guidance and the regional commissioner retained rarely exercised powers of veto. We were, however, never able to induce the German officials to regard us as advisers, and they still expected, and clearly preferred, to receive direct orders.

In each of the Länder a ministry of social we established which took over the public-health welfare services. Under the minister a permanent secretary is responsible for both and the public-health division is headed by chief medical officer, assisted by departmental officers and the regional district medical officer act as district inspectors for the new ministry.

Simultaneously the local public-health services part of a new local government set-up fashioned on the English pattern. The med of health (Amtsarzt) ceased to be responsible the central government health organisation. the local council, he was responsible to it all new appointments required confirmation ministry.

It might be expected that M.O.H.s would their release from central control and would greater freedom of action, but exactly the occurred. Military Government was inunda protests, and in the end a formal request wa the society of German public-health officials to public-health services under central control. Th they gave was fear that M.O.H.s would from now be under the direction of their town clerks dragged into party politics. Reminders that arrangement was operating satisfactorily in were commonly answered with a shrug of the and the argument that England had a few h start in the running of a democratic system.

CONCLUSIONS

It is, I think, important to all who are int the post-war development of German public recognise the difficulties under which the new laboured during the first years of its existence have therefore dealt with them in some detail. also be stated, in all fairness, that the German who were in office after the war almost worked with extreme conscientiousness in the many practical difficulties, such as the loss of their equipment, and records, the lack of transport, of stationery. Apart from the feeling of tenure almost all of them had their own serious problems—the loss of their living accommodat the constant worry of how to feed their families.

The new central and local health organisat been in existence for about eighteen months the zone, too soon to express a final judgment it was obvious that it would require a long time itself to the change. Here this country can give able help, not so much by direct interference and —that would be against our policy of intro democracy into the zone—as by an extensive pro of exchange visits. A promising start was year under the auspices of the Foreign Office Ministry of Health, and it was most satisfa observe the reaction of university hygienists, medical officers, and medical officers of health their visits to this country. It is to be hoped scheme will be continued and extended, and wil full support on this side of the Channel.

My thanks are due to Brigadier W. Strelley Mar public-health adviser to the Control Commission for (British Element), for permission to publish this also wish to record my profound gratitude to Maj J. G. Gill, C.B.E., D.S.O., for his patient guidance the two years in which I served under him.

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Q Fever in London

11. 12, and 13 three members of the pathological one nurse at a London hospital fell ill with ared to be atypical pneumonia. All recovered, uent investigation has shown that all now have ly high agglutinations against *Rickettsia* this rickettsia has also been recovered from le of blood. The usual incubation-period r (10–24 days) has now expired and there is r spread of the disease in the hospital. The infection is being investigated.

believed to be the first occasion on which has been recovered in this country. Stoker[1] ggestively high titres in atypical-pneumonia ut there has been no unequivocal serological evi- source of infection here. Q fever was first dis- l as a human disease in Queensland, Australia. and was thought to be tick-borne. Later out- slaughter-house workers in Chicago and in re attributed to inhalation of tick fæces or ner rickettsia-contaminated material. In he disease was recognised in Greece and the pennines; it has also been reported from d and Algeria.[2] In the U.S.A. endemic foci n identified in California. but the eastern was not involved until 1948. In some outbreaks e not been involved and the mechanism of mains uncertain.

nall outbreak in England. where there is no of endemicity. may be no more than an isolated on. but it calls for special vigilance. Early n of the disease and the correction of any ental factor likely to encourage spread may the establishment of endemicity. Thus it is that outbreaks of atypical pneumonia should ht to the notice of medical officers of health. for routine laboratory diagnosis are not avail- ospital laboratories. Serological studies will be en through the Virus Reference Laboratory at , London. in selected instances when special ents are made.

l Features.—Q fever is an acute febrile osely simulating virus pneumonia. It may re- fluenza. primary atypical pneumonia, psittacosis. r obscure fevers. The disease is characterised en onset. which can be dated; headaches ly retro-orbital): weakness; sweating; and l body aches. Often there is pleuritic pain and ometimes with bloodstained sputum, though ation is as a rule scanty. As in virus pneumonia. signs of pulmonary involvement are relatively mpared with the radiological findings. which rally speaking indistinguishable from primary pneumonia. The white-cell count is normal or h relative lymphocytosis. Fever is usually l persists from one to ten days or more: in ses it continues for three to six days. may be pronounced at the onset, and the fever very debilitating. Q fever is distinct from the kettsial diseases (epidemic typhus, scrub-typhus. Mountain spotted fever, rickettsial pox) by the cutaneous lesions. A fine vesicular eruption duration is seen in less than 10% of cases. The ix reaction is negative.

Poliomyelitis

week ended Aug. 27 notifications in England les numbered: poliomyelitis 258 (273), polio- itis 22 (22). Figures for the previous week are n parentheses.

ollowing counties reported multiple cases (polio- and polioencephalitis together): London 34 (35). e 3 (11), Cheshire 8 (6), Cornwall 5 (8), Derby evon 4 (9), Dorset 2 (1). Durham 3 (2), Essex Gloucester 15 (5). Hertford 6 (3). Kent 9 (6), er 33 (29). Lincs Lindsey 3 (3), Middlesex 17 (13), apton 4 (6), Northumberland 6 (7). Nottingham Somerset 7 (5), Southampton 16 (11). Stafford uffolk East 2 (0). Suffolk West 2 (3), Surrey 5 (7). East 4 (2). Sussex West 2 (3), Warwick 7 (4), e 3 (4), Yorks, East Riding 3 (1), Yorks. North (1), Yorks, West Riding 33 (50). Monmouth 2 (2). Of the 15 cases reported from Gloucestershire, 14 were in Bristol C.B.

For the first time in five weeks there has been a small fall in notifications. Thus the curve of incidence so far this year has been very similar to that in 1947, though at a much lower level. The figures of notifications for the corresponding week (week 34) of 1947 were: poliomyelitis 626. polioencephalitis 50.

Epidemic in India.—It is announced from W.H.O. headquarters at Geneva that a poliomyelitis emergency is developing in Bombay and other parts of India. Poliomyelitis is said never before to have reached epidemic proportions in India.

Canicola Fever in Bristol

At Shirehampton, Bristol. a husband and wife attended the Eye Hospital with cyclitis. Inquiry showed that each had had a febrile illness a few weeks previously. Canicola fever. in which eye symptoms often arise during convalescence. was suspected and has been confirmed by serological tests; and the community in which these patients live is being investigated. Clinical evidence suggests that there may have been some unrecognised cases in conjunction with infection in dogs: and it is understood that positive agglutination tests have been obtained in the sera of 5 of the dogs examined.

Dogs are very commonly infected with *Leptospira canicola*, and infection in man is being brought to light increasingly often. The disease normally runs a benign course. though one fatal case has been recorded.[1] In the early acute stages it sometimes gives rise to symptoms of meningitis, which may lead to confusion in diagnosis.

Infectious Diseases in England and Wales

Disease	Week ended Aug.			
	6	13	20	27*
Cerebrospinal fever	19	26	22	18
Diphtheria	89	78	59	52
Dysentery	45	62	35	90
Encephalitis lethargica	..	..	3	2
Food-poisoning	356	424	327	171
Measles, excluding rubella	3694	3226	2121	1778
Ophthalmia neonatorum	26	53	47	38
Paratyphoid fever	37	26	30	25
Pneumonia, primary or influenzal ..	221	228	245	222
Polioencephalitis	23	18	22	22
Poliomyelitis	164	236	274	258
Puerperal pyrexia	78	98	80	91
Scarlet fever	857	689	678	718
Smallpox	..	..	..	..
Typhoid fever..	5	11	6	10
Whooping-cough	1571	1738	1637	1671

* Unrevised figures.

Medicine and the Law

A Chef's Cure for Tuberculosis

An ex-Viennese chef, living in Kensington, was fined £10 at West London police-court on Sept. 1 for having unlawfully advertised by circular and letter a substance known as 'T.35' for the treatment of tuberculosis. There was a further charge of selling T.35 in a package which did not bear a label showing its composition. There was evidence that the substance was found to be ground laurel berries, costing about 2s. per lb.

The prosecution stated that an inspector of the Pharmaceutical Society of Great Britain wrote to the man for particulars of his treatment. The accused, in reply, stated that T.35 had been used for the cure of tuberculosis in Germany for 27 years and that the cost of a quantity sufficient for the treatment of a case was £5. There was a stipulation that the treatment must be superintended by a doctor.

It would be interesting to know if any medical practitioners have been invited to superintend the treatment with the defendant's laurel berries. He told the inspector that he was only an agent for T.35 in Britain. He thought that he was not committing any offence, inasmuch as he had not inserted any advertisement in a newspaper.

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[1] Stoker, M. G. P. *Lancet*, 1949, i. 178.
[2] See leading article, *Ibid*, 1946, ii, 644.

[1] Weetch, R. S., Colquhoun, J., Broom, J. C. *Lancet*, 1949, i, 906.

In England Now

A Running Commentary by Peripatetic Correspondents

ON this, the fortieth anniversary of my first driving licence, I think I am entitled to look back with gentle satisfaction. My immunity from accident may be ascribed to Goddës grace, but I can at least claim to be a long-suffering driver.

Skill in driving varies from hour to hour. My two great enemies are fatigue and preoccupation, the latter including both the distracting influence of passengers and simple wool-gathering. In my experience a little alcohol tends to improve skill, as judged by the objective tests of more accurate parking and nicer judgment of distance ; but it is a very short step from this point to dangerous over-confidence. Alcohol in considerable quantities increases my sense of cleverness, but I fail dismally in the practical tests.

The autossytic diseases are mainly psychogenic. One of the commonest—cornucopia, or much-sounding-of-the-horn—is far more conspicuous abroad than in Britain. In Lisbon, for example, all drivers blare night and day as a matter of routine. They even bay the traffic lights on the Avenida. In the London area the disease is confined to speed obsessionists on the by-pass avenues, and to a few timid creatures at crossroads in the city. Unfortunately our police, despite the *Highway Code*, still keep up the fiction that sounding the horn is evidence of good driving.

A similar ailment—much-grinding-of-the-brakes—is one of the sequelæ of the speed mania. As a symptom it is prominent in drivers who do not own the vehicle they drive. I used to believe that the trouble was confined to mild little men who were repressed at home, but it has deeper roots and is usually evidence of selfish disregard of the elements of courtesy. It is much more difficult to present the symptoms and clinical features of the form of exhibitionism associated with the use of full headlights, even in the soft light of dusk. This disorder is more common on the Continent and in U.S.A., where it is encountered in an aggravated form. Unhappily the disease is beginning to assume epidemic proportions in the outer London area. I regard this sign of discourtesy as yet another mark of the general feeling of insecurity that pervades the world of today.

*

Subjective impressions are notoriously deceptive, and it is hard to describe the signs of good driving. I have been obliged to devise a few practical clinical tests of good and bad conduct on the road. The simplest method (and the safest on the highway) is to keep records of positive acts of courtesy or discourtesy by drivers of various types of vehicle. I have done this over many years, and the time has now come for me to present my results diffidently to my colleagues. Diffidently, I say, because I am acutely aware of the pitfalls in the method. In the first place, the records relate mostly to the outer circle of cities, especially Edinburgh, Glasgow, and London. Secondly, they bear no relation to the order of frequency of the vehicles on the road: acts, easily recognisable as courteous or discourteous, often spring up without warning in a particular situation, and then opportunities may spread like a minor epidemic. One act leads to another. Often days pass without matter for note, and suddenly, perhaps in a crowded period, a whole volume of incidents takes place.

One obvious difficulty in the scheme is to decide what acts ought to be counted with the angels or against them. After several false starts I accepted the following categories and stuck to them, trying to limit personal bias as far as possible. Among the courteous deeds listed were :

1. Going out of one's way, so to speak, to help the infirm by giving them abundant room to cross the road. But what a death-trap these marked crossings can be, when one driver tries to be considerate only to find that the fellow behind him ignores his signal and crashes into (or mercifully past) the trustful pedestrian! I have seen so many narrow escapes at marked crossings in outer London that I am positively terrified to signal on the woman with the pram, and pull up to let her cross.

2. Giving clear, unequivocal signals to pass when the way is clear, and correspondingly good warnings of traffic obstruction—in other words, trying to be helpfu who are behind.

3. Being kind to those who make a mistake, down, for example, to make a transgressor's Self-righteousness is one of the gravest psycholog of the road, and is often a cause of accidents easily have been prevented.

4. Making an effort to help a fellow-driver in situation. At some time or another we become a narrow street, and the exit seems for ever beyond We perspire. Suddenly a little courteous fellow-driver makes a gap wide enough for us to into the great highway. Some months ago I was Western Avenue in the great fog. By a mis entered the wrong track of a two-way road and st thin curses of the driver who had followed me my temper a huge truck came at me from the stopped a few inches from my nose. The driver down. "Son," he said, "You are offside; can I across ?"

*

It is not for me to linger over clinical des the disorders of motoring. This has already admirably, in the *Highway Code*. Neverthel pause for a moment to examine some of the feed these distorted growths. In the early motoring sheer aggressiveness was a ruling sometimes ponder sadly on the fact that man most amiable of my fellow creatures, on possession of a vehicle capable of dealing destruction, at once reveal instincts most violent. My uncle Malcolm, a sober Clapham, used to pilot his two-cylinder Renault the quiet lanes of Surrey, at peace with the the sound of a horn behind him instantly whole being : the car shot forward and dust from its heels, smothering the passers-by. He in fact, like a runaway horse, but his sole to keep ahead of the enemy.

One interesting feature of my observations important change has taken place since I be at the end of the first world war : my 10,000 the same answer as the original 1000. How word it ? I can't express acts of good or ill in the number of vehicles on the road, for such ac concertingly irregular. But I might be allowe ment as a percentage for each type of vehicle. In every 100 acts recorded so many were so many discourteous, for each kind of dri sum works out as follows :

Vehicle	*Courteous*	*D*
Heavy truck or lorry	90	
Ordinary private car	70	
Light van (including, alas, newspaper deliveries)	50	
Sports car	40	
Chauffeur-driven private car (vicarious speeding, &c.) ..	30	

I have excluded buses and taxis from the accoun because they are not common visitors to the out

Can we assess some of the reasons for these in behaviour ? Chauffeurs are not unkindly I believe they are often images of the men be who have a lower sense of responsibility than th driver. The driver of the sports model is usuall and he wants to show off to his girl. He is noisy and aggressive, and he persistently ignores Fundamentally, he thinks that driving is a form and treats the open road as if it were a track de his benefit. The driver of the light van is oppressed by a commercial desire for haste. Fo transport vehicle is a means to an end. He craftsman's interest in it, and I suspect that despises the little brute, especially when his (with a sad lack of taste) blazon its sides wit or—worse still—decorations. How would you drive an imitation pineapple ?

The driver of the heavy truck (bless his craftsman and a gentleman of the road. He take in the open highway for its own sake, for it is hi Furthermore, he has learned the great rule of take, of consideration for the weaker vessels th so easily be crushed beneath his weight.

* * *

LINES HEARD IN A DREAM

stening to the author of the Four Quartets)

cene. My words droop over us,
repeat from patient to patient,
deaf, whisper to the worried,
ns answered.
nuscles move only in time
ich is only living can only die.
uscles reach inward
e on somatic wires
seborrhœic ooze
m its primordium ;
og-wheel turns
sa, paining the cap ;
a. slung on Eve's throat,
love not in itself desirable.
lf is unmoving. not toxic.
in and out ;
, mystics, astrologers ;
ticks, hypomanic emotions,
ophied osteophytes
ed together, yet differently
have asked before,
ling drive the cells on ?)
, muscles break under the burden.
nsion spirits slip,
tten and die.
imprecision.
l to heart and curse the doom
lpitate with hate ;
ings.

f the pattern is movement
mbol of Æsculapius.
es not comfort.
raps the staff
is caught.
the hidden laughter of children in the foliage.)
t always to the spot,
art, joint and head,
on a sad man's bed,
nude, no Psyche by a pool.
the feud
vith what is not.
d the torment,
Such is the scene.
re to turn it upside down !
, and have
gloom time,
a sentimental tune.
onised atom,
nood with the purification
y fire.
u a slice of interstellar space
e of half-burnt toast !
aching the timeless corner ?
ll round the bend ?

und apologies to T. S. Eliot, O.M.)

* * *

ger," said Mrs. Brown, "is rather a vague en he didn't come down one morning I looked and he said he felt ill, so I called the doctor sed tonsillitis, put him on the usual tablets, fluid diet, and asked for a specimen. The he'd like a cup of weak milky tea, so I took im and also a bottle for the specimen. Next t up the tea was gone but he hadn't done bout the specimen, so I took one from the ent it up to the doctor. Half an hour later the telephone to say that he was sending an to take my lodger into hospital because he tis and what was the name and address of his ? Well, we sent the lodger off in the ambu- two days later he walked in quite well again. , I thought, for nephritis from what I'd heard ll, of course, what happened was that he had nst the tea after the first mouthful and poured to the jerry, so the specimen I sent up was men, don't you call it ?"

e take sugar in his tea ?" I asked. "No." Brown. "A good thing," I said. "He e had diabetes as well."

* * *

No sooner had the three doctors reached the deserted wayside station than they heard the incongruously loud horn of the "Empire Builder." Soon this massive transcontinental streamliner rounded the bend and its powerful searchlight, sweeping up the track, illuminated the silver birches and swamps which bordered the great Mississipi river. Two minutes later the orange-snouted diesel engine hurried beyond the bend of the station platform and brought its immaculate steel cars to rest. The grinning negro attendants, with shiny white teeth and spotless blue uniforms, immediately appeared in the foyers, directing the Australian to his sleeping-car, while the air-conditioned passengers looked down approvingly at the newcomer. Hastily he bade his friends farewell, climbed aboard, and smiled down at them. The long fleet of coaches gathered speed and rapidly faded out of sight, with the observation car gleaming to the last in the rays of the setting sun. At the Twin Cities it would turn due west, traversing a thousand miles of prairie and the mountain ranges of Glacier National Park; speedily it would take the visitor to Portland, Oregon, and so on to San Francisco, where a plane would take him home via Honolulu.

Silently the two doctors returned in the Oldsmobile towards the sleepy town of Winona, over the high single-span bridge which leads back to Minnesota. Beneath them lay forest-studded islands and white pleasure craft sparkling in the tranquil waters of the broad upper reaches. Behind them rose the colourful hills of Wisconsin. "He is a swell fellah," said the doctor from the Mayo Clinic to his companion. "You know, a visit from a guy like that does more for good international relations than an embassy full of diplomats."

* * *

I have just been browsing through my *List of Abbreviations used in Prescriptions*. It is, I am afraid, a sad reflection on the effete old days before the Act and we are doubtless due for a committee to effect a drastic revision. Before it is too late, may I plead for "*Deaur. pil.*—let the pills be gilded?" The shop steward, of course, will be certain that *deaur. pil.* was a prescription exclusively for the squire and his relations and will prefer our democratic medicine with plain pills for everyone. I like to think, though, that the real use of *deaur. pil.* was on Christmas Eve, when the successful practitioner could celebrate the occasion with a round of gilded pills for all his patients. Perhaps the committee might let it go into respectable retirement as a red silk motto over some Ministerial mantlepiece.

No such pleading must save "*Ne tr. s. num.*—do not deliver unless paid." What a ghastly indictment the cartoonists would make of this! Under the heading "Medicine in the Bourgeois State" one can see the doctor's apprentice, top-hatted and with blood-stained coat, leaning insolently against the door-post while he holds aloof the bottle of life-giving fluid and repeats relentlessly, "*Ne tr. s. num.*" to the expiring pauper. The committee will have to expunge it, but perhaps they might recommend the use of "*q.p.*—as much as you please" in its stead.

* * *

After a busy day spent in doing differential blood and bone-marrow counts, one finds it difficult to stop counting when working hours are over. Thus, though one has come to America to do hæmatological research, one tends to stray into other fields. For example, as one sits in the hospital cafeteria, the 'Nylon' uniforms worn by many American nurses make one's attention wander from the foodstuffs. The difference between the words translucent and transparent was carefully explained to us at school. These uniforms are transparent. So the differential counting can continue during the meal hours. Somehow the nylon uniforms to date have all ceased to be transparent at the waist level, but in the upper reaches there appear to be three possible types of garment visible beneath. The uppermost has two sets of straps; all differential counts so far have included one example of this piece of apparatus. On most days there is also worn what is technically known as a "slip," but on hot days this is replaced by a "half-slip," the intervening area being pink. It is possible to do white counts, pink counts, and, on one occasion, even a blue count on these garments. During really hot weather the true gentleman of course avoids the cafeteria.

Letters to the Editor

CLINICAL PATHOLOGY

Sir,—A recent leading article,[1] discussing the hæmatological diseases of infancy, called for more coöperation between the physician who specialises in hæmatology and the pædiatrician.

At the time it occurred to me that the phrase "physician who specialises in hæmatology" was either a needless circumlocution for clinical pathologist, or an attempt to provoke a reaction from the increasing number of pathologists who favour the development of a concept of clinical pathology as an approach to medicine distinct from that of the clinician on the one hand and the academic pathologist on the other. This article resulted in only one cheer—from Dr. A. Piney,[2] who applauded the inference that hæmatology was the province of the specialist physician.

Clearly you were not merely indulging in circumlocution, for you repeated your contention in unmistakable terms in a further leading article on Aug. 6 (p. 243): "The hæmatologist, on whom these surgeons rely, is not a clinical pathologist: he is a physician, a clinician who is capable of making his own assessment and if necessary a personal interpretation of the hæmatological data and material . . . in the light of the clinical picture as a whole."

This challenge was taken up by one of our foremost clinical pathologists, Dr. S. C. Dyke (Aug. 13, p. 303). Unfortunately Dr. Dyke took these words from the article—"a clinician who is capable of making his own assessment and if necessary a personal interpretation of the hæmatological data and material"—and suggested that this was a perfect definition of a clinical pathologist. No clinical pathologist will mistake Dr. Dyke's meaning, but as it stands does it not concede the argument? Is a definition of clinical pathologist to begin "a clinician who . . ." or "a pathologist who . . ."? For this is the whole substance of the debate.

So far no attempt has been made to formulate a succinct definition of clinical pathology. Those specialists who make a point of calling themselves clinical pathologists have a fairly clear idea of its content, its method, and its value. "Bringing the laboratory to the bedside" is a picturesque description, but not very enlightening or convincing to the sceptic or uninitiated.

The war and post-war years have seen great expansion in pathological services, exceeding that in any other branch of medicine. This expansion took place even though the number of trained pathologists was quite inadequate. It was impossible to provide each new laboratory centre with expert morbid anatomist, bacteriologist, hæmatologist, and biochemist, who formed the principal staff of the pathology departments in the teaching and larger municipal-hospital laboratories. At the same time, the demands on laboratory workers developed a new emphasis: chemotherapy, antibiotics, blood-transfusion, and epidemiological investigations called the laboratory-worker more often away from the laboratory bench to the ward.

Perhaps without being aware of it, the majority of pathologists in the Emergency Medical Service and the associated Emergency Public Health Laboratory Service found themselves practising clinical pathology, acting as consultants in those diseases where diagnosis and therapy depend largely on laboratory findings, and developing a new technique of coöperation between clinician and laboratory-worker. One manifestation of this new emphasis was the rapid increase in the membership of the Association of Clinical Pathologists.

At present the inadequacy in the supply of pathologists is being made good. The pattern lishments now being designed for pathology in the health service is once again a consultant of the special departments. This is undoubt good. But it would be a great loss if these were to abandon entirely the new approach to pathology which has received such impetus in years.

There is perhaps a real danger that one cerebrospinal fluid, for example, may be inv three separate departments, each unaware of the findings and all sublimely unaware of the pa for this reason that a clear definition of clinical is needed—to crystallise an outlook and pra has done as much as, and perhaps more than to raise the general level of medical practice country in recent years.

I put forward as a tentative definition: " pathology is the laboratory analysis of sym signs," and for the sake of completeness "and the laboratory control of therapy." definition brings the clinical pathologist straight wards and faces him with the needs of the p makes clear that his method is laboratory m leaves no room for misconception of him as an physician. Yet his work demands considerable training. An important point is the em laboratory method. It is difficult for the to appreciate fully that the interpretation of results is intimately associated with the t used to obtain them. And it is the acquisition techniques as his primary tools which distin pathologist from the physician. Herein lies the of the remarks in your leading articles.

If a specialist chooses to practise clinical pat yet call himself a physician, he of course ma there is no more ground for calling hæma province of the physician than there is for calling histology the province of the surgeon or bacte province of the medical officer of health.

The question is one of orientation. The p only gain when the clinical pathologist thinks of in terms of plasma-proteins; he can only lo physician fails to think in terms of malnutrit both think of œdema.

Does this ban laboratory methods to the ph By no means. The physician must have some in clinical pathology. But the physician who h looks down the microscope is in grave danger of sight of his patient.

J. Fr

Paddington Hospital, London, W.9.

PREVENTION OF BURNS AND SC

Sir,—May I let you know how the problems Dr. and Mrs. Colebrook in their article of July 30 to the textile chemist?

It is appalling to read of the loss of life and suffered by young children as a result of their catching fire. That little or nothing has been d prevent accidents of this type is dismaying, be very largely due to widespread ignorance of frequency. In this respect the article will do g

There is no easy solution to the problem of cotton, wool-cotton mixtures, or viscose rayon non-inflammable; if there had been, it would d have been adopted. The application of the large quantities of metallic salts necessary to cellulose fabrics non-inflammable is always acco by serious disadvantages; the most obvious of that the "handle" of the fabric is badly affected roughened and no longer has the kindly "feel" is one of the most widely appreciated charact textile materials.

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[1] *Lancet*, 1949, i, 919.

[2] Piney, A. *Ibid*, p. 1023.

ỵ, the fire-proofing of textiles usually depends plication to the fabric of some chemical which, ted, will chemically "destroy" the fabric ignition temperature. Phosphates are among fire-proofing agents, but when ammonium is heated ammonia is evolved and phosphoric ated; this is a very strong acid and chars the l below its ignition temperature. A hot iron only slightly scorch an untreated fabric will ken the same fabric if it has been fireproofed.

, and perhaps most important of all, I believe nown fire-proofing process is fast to washing. plication the fire-proofing agent gradually ut, and the dangers attending the use of a ofed" material which after repeated washing its proof, are evident. The false sense of nay well make matters worse.

re some fire-retardants on the market; one of popular in America, is a mixture essentially of mmonium sulphamate and 15 parts ammonium e. But I believe that no known agent will on or winceyette fabric fire-proof after repeated and all adversely affect the desirable attributes ile material. Usually the textile manufacturer luctant to adopt a "functional finish" which iseful purpose; the almost universal application ase-resistant finish to spun rayon is an example Manufacturers and finishers have not adopted of finish for cotton and winceyette fabrics for reason that no satisfactory process is known.

is, however, another line along which the of providing children with flame-proof clothing attacked, and that is by the manufacture of rom fibres other than cotton or viscose rayon. acetate has for many years been used for d enormous quantities of cellulose-acetate rayon e. The raw material is cellulose, usually from nters or wood-pulp; but the substance has been d during manufacture. The acetylation is a mical combination, so there is no possibility acetyl content being reduced during washing leaning. The chance of a cellulose-acetate being considerably consumed by accidental with an electric fire is extremely small; fabrics om mixtures of wool and cellulose acetate e even less dangerous. Cellulose acetate is made rm of continuous-filament "artificial silk," and the form of cut staple—i.e., filaments cut into of one or two inches and then spun into a yarn same way as cotton. Garments made from -acetate rayon, or from mixtures of it with wool, e normal attributes of a good textile material, less inflammable than most. If such fabrics are into a hot fire, they will burn away: but if only locally the flame will sometimes extinguish It appears, in fact, that the use of cellulose- staple-fibre rayon, instead of cotton, would the danger of injury through clothes catching

possibilities present themselves, but are hardly for immediate adoption. Thus, many of the res, particularly those made from chlorinated ompounds, are fireproof. 'Pe Ce,' a heavily ted vinyl-chloride polymer, was used by the s for fire-resistant clothing for their flying el. 'Saran' and 'Velon,' which are essentially ylidene chloride, are fire-proof; but these fibres sture-resistant, they will not absorb perspiration, y cannot be ironed normally; they are usually red unsuitable for indoor wear, and particularly erwear; at present they are quite unsuitable for 's wear; and it is doubtful if they are obtainable, in the United Kingdom, in large quantities. In future it may well be that wool will be diluted (for cheapness) not with cotton but with regenerated protein fibres, which will be much less inflammable than cotton. Already 'Vicara' (made from maize protein) is obtainable in America, and 'Ardil' (made from ground-nuts) is being made on a pilot-plant scale in Scotland. But these are for the future—they offer no immediate solution to the problem of providing large quantities of non-inflammable material.

'Nylon,' as your contributors note, is useful; and, when large quantities become available in staple form at a low price, will undoubtedly be used for wool mixtures. For the present, the substitution of cellulose acetate for cotton and viscose rayon appears to offer a reduction of the fire risk.

Harrogate. R. W. MONCRIEFF.

NATIONAL COAL BOARD

SIR,—I read with interest the article on the Mines Medical Service in your Students' Number (Aug. 27).

The last paragraph, which purports to describe the responsibilities and achievements of the National Coal Board in the field of health, does less than justice to the considerable developments which the board has made since Jan. 1, 1947. As the article says, the board has a statutory duty "to secure the health" of the people it employs. To this end the Board decided, in 1947, to establish a medical service for the industry along the lines of the best practice in other industries. It was to provide pre-entry and other medical examinations first, and on occasion further treatment of accidents, the first treatment of illness arising at work, consultation in certain cases, advice on environmental conditions, supervision of hygiene and working conditions generally on the surface and underground, and so on.

The first seeds of a service had been sown by the Ministry of Fuel and Power in their medical treatment centre scheme, but when the National Coal Board took over the industry no medical treatment centres had yet been completed, and the industry employed only three full-time doctors, a number of part-time doctors, and 22 State-registered nurses. The National Coal Board by now employs 25 full-time medical officers, 66 State-registered nurses, and a considerable number of part-time doctors. Fifteen medical centres have been completed, and at fifty-one collieries existing buildings have been adapted to provide accommodation for this service. But for the request of the Prime Minister in June, 1949, when he set up the Dale Committee, that industries should withhold any major developments of their medical services, much greater developments would by now have taken place.

The scientific department of the National Coal Board is contributing to research on medical and other human problems in the industry. The rehabilitation centres and other health activities of the Miners' Welfare Commission are now coördinated with the National Coal Board.

Whilst acknowledging the very valuable work the Mines Medical Service of the Ministry of Fuel and Power has carried out in the past and continues to carry out, your article hardly makes clear the fundamental difference in responsibility between this service and that of the National Coal Board.

The Ministry of Fuel and Power medical officers are primarily concerned with the supervision of the industry with respect to the various statutory requirements on health and advising the Minister on various professional matters. The responsibility for executive action in securing the health of persons employed is that of the National Coal Board, and this responsibility the Board has fully accepted.

National Coal Board,
London, S.W.1.

ERNEST H. CAPEL
Chief Medical Officer.

STUDENT HOUSE-APPOINTMENTS

SIR,—In your issue of Aug. 27, a peripatetic correspondent bemoans the fact that medical students are sometimes allowed to deputise for qualified residents. As a student who has done such work during the summer vacation, may I suggest three excellent reasons for the continuance of this practice:

1. It adds a few more bricks to the edifice of experience. Your correspondent thinks that there is ample time, after qualifying, for perfecting the technique of giving a transfusion and performing a lumbar puncture. But surely a little more attention to practical work during student days with less anxiety over theory and the more rare diseases would make for greater competence.

2. Many students find it necessary to replenish their depleted coffers during the summer vacation. If they must work, it is surely best for them to work in their future profession.

3. For eight months of the year students grind away at theory, with very little practical work; and the [illegible] cquiring a little practical experience [illegible] energy.

True, our teachers aim at producing the best doctors. but "technical competence" is every bit as necessary as "basic understanding." In one we use our hands, in the other our heads; the master craftsman uses both.

MEDICAL STUDENT.

THE MEMBERSHIP

SIR,—I should like to express general agreement with the views given by Professor McMichael in your issue of Aug. 27.

I have for many years tried in the overseas Commonwealth to impress on universities and doctors the dictum that "higher qualifications" should be obtained—if at all—two or three years after initial graduation *in the same university,* and that expensive visits to Europe and America should be used for real postgraduate work with no examination in view.

In the overseas Commonwealth the standards of higher-diploma examinations in England are grossly exaggerated and the kudos accorded to the successful "Europe returned" candidate is wholly absurd.

So far as the M.R.C.P. London is concerned, the lowest age of entry was reduced from 25 to 23 years in recognition of the fact that young men capable of passing the examination were being kept back by the then existing regulations. When I appeared for the membership, a fellow-candidate, who had just reached his twenty-fifth birthday, had for some time been conducting a successful M.R.C.P. coach-class, and he passed along with some of his middle-aged pupils! The Royal College of Physicians has performed a real service in revealing the fact that the membership is not the recondite and mysterious qualification which many had supposed. The London College is to review its decisions in two years, and the regulations of the sister college in Edinburgh might be examined with advantage. Many of my former medical colleagues in India were M.R.C.P. Lond. and Ed. I think they derived more benefit from the Ed.!

Professor McMichael says with truth that study for examinations cramps and harasses excellent young men from the Dominions. Unfortunately some of them are only too willing to be so harassed.

Some years ago an appeal[1] which I made in India for the provision of higher degrees and diplomas in all Indian universities—"Indian degrees for Indian graduates"—met with enthusiastic and almost unanimous approval in both the medical and lay press—English and vernacular. The final paragraph was in close accord with Professor McMichael's thesis:

> "Let us get rid of the prevailing tendency to insist on overseas diplomas rather than on overseas experience, on contact with coaches instead of creators, and wi instead of inspiring leaders. Let those who sail do so in order to reap a rich harvest of the world of advanced knowledge rather than to scratch over which they have already ploughed."

I noted with pleasure in the *Times* of Aug. Nuffield Foundation travelling fellowships for A were "not available to persons who wish to the M.R.C.P. or F.R.C.S." I have hopes that one day impose a similar ban on her many travelling postgraduates.

Ewell, Surrey. GEORGE R. Mc

PROS AND CONS

SIR,—In his comment on my article of Ex-Examiner (Sept. 3) confuses the act of with the pleasure derived from the amenities are so generously provided for the visiting e My delight in this hospitality, punctuated often with conviviality, is not less than your corr but this does not affect my appraisal of exam

It is not difficult to imagine more congenial stances than those offered by an examination for his "sense of isolation as a provincial teacher", least as much might be said of the "s experience." But perhaps Ex-Examiner prefers his pleasures sadly.

The University, Glasgow. STANLEY AL

MALLEOLAR FRACTURES

SIR,—I should be grateful if you would allow reply to some points raised in your annotation of

It is true that the os calcis and astragalus form a rigid lever until the limit of mobility subastragaloid joint has been reached; but ab I believe they do. As one pictures this occ becomes clear that the centre of rotation lies bel ankle-joint, and it is in this that my explanation mechanism differs from the conventional one.

The annotation says: "External rotation of is responsible for the commonest of the fractures." But is this so? I cannot say that experienced or observed this form of strain at quently, and cannot think of many occasions in life or in sport where one's foot undergoes this rotation. Here again, I believe, a theoretical m has been thought of first and the clinical facts ha fitted into the picture. This, incidentally, would my answer to Mr. Bonnin (Aug. 20). I cannot that it is right so persistently to ignore statements.

Rotherham Hospital. E. G. H

OVERDOSE OF AMPHETAMINE

SIR,—Dr. Worsley's note last week (p. 445) me to report an unusual experience with a pati took an overdose of this drug.

Six years ago a young man, aged 26, was found to right-sided pulmonary tuberculosis. He was trea artificial pneumothorax and has had periodic refill months ago the left lung was found to be affected. was admitted to a hospital where he was given a tw course of streptomycin injections. While in ho appeared depressed and was given amphetamine tab

On the morning after he arrived home he swallowed a hundred tablets of amphetamine, each contain of the drug, which he had brought home from the Several hours later his relatives found him perspiring His eyes were staring, and he was very restless, conf delirious but not unconscious. His private doctor wa and attempted stomach lavage, but not much suggesting the presence of dissolved amphetamine ta obtained. His clinical condition did not give rise t anxiety, so he was kept under observation at home. Ad to hospital became necessary later in the day, suddenly jumped out of a first-floor window and in spine; he did not lose consciousness.

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[1] *Ind. med. Gaz.* 1944, 79, 171.

ssion he was very confused and unable to account ions. He was pale and was perspiring profusely. s looked normal and reacted to light and accom- nystagmus was present; the tendon reflexes and equal, and the plantar responses were flexor. erature was normal. The pulse-rate was 160 per e blood-pressure 110/85 mm. Hg. This tachycardia or 3 days and the rate only gradually returned to An electrocardiogram showed sinus tachycardia; nterval was short, but no other abnormality was od-count: Hb 98%; red cells 4,500,000 per c.mm.; s 19,300 per c.mm. (neutrophils 84%, lymphocytes ocytes 7%). Urine examination revealed no ty apart from a slight trace of albumin. X-ray on showed fractures of the 3rd and 4th dorsal right artificial pneumothorax with satisfactory f the lung, and some tuberculous infiltration in the

ient made a good recovery.

conservative estimate this patient probably about 400 mg. of amphetamine in a single dose. ne may conclude that amphetamine is not a very s drug, even when taken in large amounts.

E.11. **Eric Frankel.**

PRICKLY HEAT

I was very interested in the article by Dr. d Dr. Mole in your issue of Aug. 13.

medical officer in Massawa during the late war, d that my wife and I and my batman, who did the daily salt tablets, were the only Europeans not suffer from prickly heat. I advised some of onal friends privately to stop taking the tablets, r skin cleared up quickly. I have never had more patients! **P. Robinson.**

WHY NOT GENERAL PRACTICE?

–I am sure that all thinking men and women gratulate you on the able leading article of ', which throws into bold relief the points I have in *State Medicine or What* and *Your Doctor of ure.*

so many years ago, at an annual meeting of men in London, I suggested that in the clinical g of students much more attention should be to the treatment of such subjects as bronchitis aged, infantile diarrhœa, and the infectious and that less heed should be paid to the rarer s often seen in the wards of a teaching hospital. reak with tradition was greeted with cries of wn." Times have changed.

the institution of the National Health Service as been a scramble for higher diplomas and st appointments. How much better it would be terms of service for general practice were made attractive with those for specialist appointments, the best brains might be attracted to that branch icine. After all, general practitioners are the shock of medicine, on whom depends the success of the . As the Spens report observed: "It would be ous to the profession and to the public if general e were recruited from the less able young s." And did not you yourself say[1]: "To be -class G.P. is harder than to be a competent ist."

ould like to readvance my argument, in *State ne or What*, that the usual road to specialist tments should be through general practice in the stance. Not only would the future specialist a practical knowledge of the difficulties of the ut the G.P. would also appreciate the trials of the ist; and thus a new and profitable harmony be created. All would subsequently follow their nd with the creation of chairs in general practice ay would be open for the most able, if they so desired, to become specialists in general practice without any financial loss compared with colleagues in other branches.

Worthing. **Harold Leeson.**

HYPERSENSITIVITY TO NORADRENALINE

Sir,—During a series of experiments on the effects of intravenous administration of mixtures of *l*-adrenaline and *l*-noradrenaline, one subject (R. F. W.) was found to be remarkably sensitive to *l*-noradrenaline but normally sensitive to *l*-adrenaline.

Infusion of 8 µg. of *l*-noradrenaline and 1 µg. of *l*-adrenaline per min. for $4^1/_2$ min. raised the blood-pressure from a resting value of 130/95 mm. Hg to a peak value of 230/150 mm. Hg, and slowed the pulse-rate from 74 to 54 per min. The subjective sensations were extremely violent pulsating occipital headache with some photophobia and stabbing retrosternal and pharyngeal pain, all of which were accentuated with each heart-beat. The infusion was stopped when the subject complained of the unbearable headache, but the hypertension declined slowly and sixteen hours later the diastolic pressure was still 110 mm. Hg (normally 90–95). As an intracranial hæmorrhage was feared, a clinical examination (R. S. A.) was made 50 minutes after the onset of symptoms. There was pallor, profuse sweating, and vomiting, but no clouding of consciousness or signs of meningeal irritation. There was no evidence of any lesion, and severe cerebral congestion was diagnosed. Eighteen hours later an electrocardiogram and electroencephalogram were both normal, and the subject was left with a slight occipital headache.

Equivalent amounts of noradrenaline administered to all our previous subjects (six subjects in 11 experiments) caused no subjective symptoms and the rise of systolic or diastolic pressure was less than 20 mm. Hg. Barcroft and Konzett[1] have also found that doses of *l*-noradrenaline of 10–20 µg. per min. caused negligible symptoms.

This preliminary communication is made to warn other workers using noradrenaline of the possibility of individual hypersensitivity to the drug.

R. S. Allison
C. deLargy
A. D. M. Greenfield
R. L. McCorry
R. F. Whelan.

Department of Physiology,
Queen's University, Belfast.

"FOOLPROOF" BLOOD-TRANSFUSIONS

Sir,—I disagree with the statement made by Dr. Wiener in his letter of June 18 that "there is no longer any excuse for using the dangerous techniques necessary for transfusing unmodified blood."

During the past ten years I have given more than three thousand direct blood-transfusions, and I consider that there are occasions when not only is there a good excuse for giving unmodified blood but a direct transfusion is life-saving. I refer to cases in which there is recurrent hæmorrhage, and in particular to hæmatemesis[2] whether due to peptic ulcer or blood dyscrasia.

I first became interested in the transfusion of unmodified blood when a patient with hæmophilia continued to bleed despite repeated transfusion of fresh citrated blood, but stopped bleeding immediately when a direct blood-transfusion was given. Since then I have found on numerous occasions that as a hæmostatic unmodified blood is preferable to citrated blood, whether fresh or from the bank.

The main objection which Dr. Wiener raises to direct blood-transfusion is that there will be a dangerous rise in venous pressure. In cases of hæmorrhage I have never observed clinical evidence of an abnormal rise in venous pressure. In chronic anæmia there is such a possibility, but it occurs with both direct and indirect transfusion. In indirect transfusion the rise in venous pressure was found by Loutit, Mollison, and van der Walt [3] to be approximately proportional to the amount of fluid given, and they state that the rate of transfusion played a less important part although pressure rose more often at the faster rates.

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[1] Leading article, *Lancet*, 1947, i, 25.

[1] Barcroft, H., Konzett, H. *Lancet*, 1949, i, 147.
[2] McLean, J. A. *R. Melb. Hosp. clin. Rep.* 1947, 18, 14.

On two occasions, when direct transfusion was given to patients suffering from chronic anæmia there has been increased venous pressure with symptoms of cardiac embarrassment; these symptoms were immediately relieved by venesection. The incidence of this complication in my series was less than 1%. In giving a direct transfusion, the operator is at hand if such symptoms should arise; and the condition is readily relieved by inserting a transfusion needle into a distended vein and withdrawing a few ounces of blood.

The technique of direct transfusion is difficult, but with practice in the use of a Julian Smith rotary pump and transfusion needles which are highly polished on the inner surface, the operation becomes simple, smooth, and effective.

With regard to the risk to donors, I have never seen or heard of a case in which there was transmission of infection. With the rotary-pump method infection would be due to negligence. On the other hand I have observed the accidental introduction of air into a donor's vein while blood for indirect transfusion has been collected into a bottle by gravity flow [4]—not into a vacuum flask, which Dr. Wiener mentions as an explanation for such a mishap.

Melbourne. John A. McLean.

EXPERIMENTS ON ANIMALS

Sir,—We are not out of sympathy with the views expressed by your correspondents of Aug. 6 or with your editorial comment in the same issue. We wish, however, to draw attention to a recent experiment on human beings.

In The Lancet of Jan. 22, there appeared a report under the title "Effects of Agenised Flour on Man." This described work designed to test what is a normal constituent of our diet in this country for toxic or other effects. The work involved the elimination of agenised flour from the diet of an experimental series of human subjects and their comparison with controls. To this there can be no objection. The investigators went further, however; for, finding that their control series were eating flour agenised at a level well below the maximum for commercial flour, they performed the additional experiment of *increasing* the dose of the potential poison until it reached this maximum.

Now the experimental subjects were boys aged 10–15 years from a residential school almost all of whose pupils came from homes that were social failures. They cannot therefore be regarded as being above "the age of consent" for the purposes of experimentation, nor is there any suggestion that their consent was asked or obtained. In our view the conduct of this experiment is, in consequence, open to grave objections, and the precedent it provides should be generally renounced.

The fact that the increased dosage was given at all shows that the investigators recognised that it might have some effect. What that effect might be can only be guessed from the original work on dogs and ferrets. In the light of what the authors call "the lack of knowledge of the reversibility of any changes which might occur" (in dogs) the second part of their experiment was in fact a risk to the health of helpless children. We fully realise that the maximum dosage given could be found in a commercial flour. The report makes it plain, however, that "Considerable difficulty was experienced in obtaining sufficient quantities of the flour agenised at 12 g. to the sack"; and it must be presumed that such high levels are very rare in normal diets.

May we hope that in future only volunteer be used in experiments designed to estimate the of treatments suspected of being dangerous to

Dunca

Bickley, Kent. D. R. N

*** This letter has been shown to the author paper referred to, who replies as follows:

"No exception can be taken to the ethical expressed by Dr. Leys and Mr. Newth. These fact scrupulously observed both in the original of the experiment and in subsequent mo Although this is not expressly stated in our American workers had shown before we change to the flour of higher agene content tha higher levels of agenisation are harmless to We ourselves had confirmed this in adult v —Ed. L.

POLIOMYELITIS AND TONSILLECTO

Sir,—The death of two brothers from polioen following tonsillectomy, to which you ref week, recalls an equally tragic case reported and Toomey.[1] Of a family of 6 children, 5 who went tonsillectomy on the same day all developed poliomyelitis; 3 of them died while the parents sixth child remained well. There was at the a low incidence of poliomyelitis in the district they lived.

There are, of course, other risks associated operation, and it would seem justifiable to ad apart from poliomyelitis or other epidemics, that of the same family should not undergo tonsillec other non-urgent operation at the same time.

Keith

London, W.10.

KEEPING BUSY

Sir,—There are two things wrong with the Act as it stands which any doctor can readily see for

1. Before July 5, no sickness benefit was paid injured. As soon as the case was settled in court common for the plaintiff to return to work. Now, benefit is not affected by damages recovered at co with the result that it will be virtually impossible to to work any man who is suffering from that common compensation neurosis. He will be paid for being n

2. Between the ages of 65 and 70 a man loses his full if he earns more than 20*s*. per week. It is a common see a man between those ages do no work, but at 70 he on a new lease of life and takes on jobs within his ca

What a tragedy in these days of insufficient lab waste the energy of these men who, but for social would keep themselves busy—aye and happier the pensioner keep his pension regardless of his and good luck to him.

C. H. F

Braintree, Essex.

*** Dr. Fagge raises two interesting points is some confusion, however, in the presentation first point. Presumably he is referring to injury under the National Insurance (Industrial In Act, and not to ordinary sickness benefit un National Insurance Act. In injury benefit, as in s benefit, the doctor through his certificate is of the arbiter as to incapacity. At the end of the benefit period—which in any case is limited to 26 w residual disablement, if any, is assessed by a board and a percentage award made in suitable In substantial injury cases the award takes the f a disablement pension. The latter is payable r of earnings and thus work is encouraged. The m common law claims, in occasional cases wher injured worker is alleging negligence on the part employer, is of course unconnected with the in scheme. Dr. Fagge's second point is discussed leading article on p. 469.—Ed. L.

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3. Loutit, J. F., Mollison, M. D., van der Walt, E. D. *Brit. med. J.* 1942, ii, 658.
4. McLean, J. A. *Med. J. Aust.* 1943, i, 162.

1. Krill, C. E., Toomey, J. A. *J. Amer. med. Ass.* 1941, 1

Obituary

THEODORE STACEY WILSON

M.D., B.SC. EDIN., F.R.C.P.

Stacey Wilson, who died at his home in n on July 30, had outlived most of his con- s, and his long life reflects many of the facets ng medicine in an age before two great wars advances in knowledge.

Edgbaston in 1861, he was educated at Grove ool, Tottenham, and Edinburgh University, graduated M.B. with honours in 1883. Two after study in the clinics of Vienna, he returned ve Midlands as resident medical officer of the m General Hospital. He became assistant in 1889 and honorary physician in 1892. In year he was awarded a gold medal for his . To those who only knew him in later years nge to think that he had retired to the post of physician' in 1919 after extra years during He continued, however, to practise privately etically until just before his death.

gue writes: "Stacey Wilson learnt his medicine sed it before the ancillary methods of investi- d treatment, which are now commonplace, vn. He always remained an exponent of the reful history-taking and thorough physical on. His enthusiasm for clinical investigation ted, and his studies on what he called tonic of the colon and on a number of disorders of and blood-pressure were carried on pains- That their acceptance by his colleagues did in no way abashed him. He produced many ns to expound his theories, and at the time of was completing a further book on heart

ng his own colleagues he did not have many or the intensity of his devotion to his own and his failure to adjust his views to those of d to the changing concepts of modern medicine n seem secluded and peculiar. But despite his ervous manner and gaunt appearance he was h warmth and kindness to his fellow men. His were grateful and devoted for his painstaking tle care, and his large circle of friends and —he was a Quaker and member of a large inter- amily in Birmingham—will remember him for ce he continuously gave to the community over n half a century."

. D. adds: "Stacey Wilson belonged to a on of medical men who had to depend more on e of hand and ear and eye in the observation of One was always impressed by his skill in the is own methods; he possessed qualities which necessary for true success. He had confidence owers of observation, and he was able to inspire ce in his patients. How to help his patients was t consideration. and he gave himself entirely to

ALEXANDER SCOTT

M.A., M.B., B.SC. ST. AND.

lexander Scott, senior tuberculosis officer for r, died on Aug. 16 at the age of 50.

duate in arts, medicine, and science of St. Andrews ity, he qualified in 1928. After holding the ment of clinical officer to the Staffs, Wolver- n, and Dudley joint board for tuberculosis, he deputy superintendent at Baguley Sanatorium. s also assistant tuberculosis officer at Sheffield he was appointed to his present post at Leicester. t's work there E. K. M. writes: "Following, as , a man who had given the last 30 years of his ional life to the work of the local tuberculosis as not particularly easy, but Scott soon endeared to the staff and even more especially to his s. A man of great courage, he had a zest for and everything—his profession, his garden, his ping—was intensely interesting to him."

eaves a widow and four young children.

Notes and News

FLIES

The average doctor knows very little about flies beyond the need to exterminate those which contaminate food; and then probably he does not know how they contaminate it, unless he has attended R.A.M.C. lectures. If he is middle-aged he has probably read his Shipley,[1] and if he has served in tropical or subtropical areas he is probably acquainted, through a War Office manual, with the vectors of such fly-borne diseases as malaria and phlebotomus fever. If he has a penchant for entomology as a hobby he has probably studied Imms[2] and may carry Sanders[3] in his pocket. But, if he has wanted to study flies in this country seriously, he has met with great difficulty in identifying them, because no key to all the known British diptera (of which there are more than 5000) has yet been published. This defect is now being remedied by the Royal Entomological Society of London, which is publishing ten volumes of *Handbooks for the Identification of British Insects*. The volumes are issued in separate parts at 7s. 6d. each, and vol. IX, part 1, an introduction and key to the families of diptera by H. Oldroyd, is one of those which can now be obtained from the rooms of the Society at 41, Queen's Gate, S.W.7.

University of Cambridge

On July 30 the following degrees were conferred:

M.D.—*A. P. Bentnall, Richard Fletcher, *Arthur Leese, J. M. Lipscomb, *A. P. Norman, *T. P. Pattinson, *J. R. Squire.

M.B., B.Chir.—*Joseph Armstrong, *G. K. Barker, *Arthur Bates, D. A. A. Beardsmore, *P. E. Bodkin, *E. C. A. Bott, *J. F. Boyle, Billie I. Brown, *David Bulmer, *Janet F. C. Callow, E. A. Cooper, Patricia B. Corston, *G. A. Court, *P. J. Crosland-Taylor, R. D. Eagland, *M. A. Epstein, R. W. Fairhead, *E. H. R. Ford, *Donald Gough, *G. A. Gresham, Brenda M. Grimmett, *E. C. B. Hall-Craggs, *R. N. T. Higgins, *B. J. Hockey, *L. B. Hunt, *D. S. Kerr, L. C. Hurst, I. P. James, E. W. P. Jones, M. J. Kehoe, *H. P. Lambert, *A. J. Lane, *D. G. A. Leggett, *D. W. L. Leslie, *Colin McCance, I. R. McWhinney, *T. C. K. Marr, *J. D. Marsh, *W. P. L. Morrison, *J. H. Neame, H. R. Odlum, *B. W. Peckett, *P. T. Perkins, *Adolf Polak, *M. T. Pym, *J. H. Rack, *J. M. Roberts, *C. A. Rogerson, *J. B. Self, *L. R. Spencer, *T. E. Stockley, *R. A. Struthers, *T. J. Sullivan, M. K. Sykes, *D. G. Thompson, *P. W. Thompson, *Ellen Veldhuyzen, *Dorothea P. Wagstaff, *C. B. Walker, *I. S. Waller, *S. A. Wartski, *J. F. Watkins, *R. G. Watkinson, E. J. Watson-Williams, *Dinah D. Webb, *J. L. Whitby, *B. F. Whitehead, *Matthew Wilkinson, *H. B. L. Williams.

* By proxy.

University of London

Dr. A. C. Cunliffe has been appointed to the readership in bacteriology at King's College Hospital medical school. Dr. J. L. Malcolm has been appointed to the readership in experimental physiology at St. Mary's Hospital medical school. Mr. Joseph Rotblat, who is a doctor of physics and a master of philosophy of the University of Warsaw, has been appointed to the chair of physics at St. Bartholomew's Hospital medical college.

University of Liverpool

If there are sufficient applications a part-time postgraduate course will be held during the coming session in the department of obstetrics and gynæcology and in the hospitals associated with the clinical school. Applications should be sent to the Dean of the Faculty of Medicine, The University, Liverpool, 3, by Sept. 10. For details see our issue of Sept. 3 (advt. p. 21); in some copies this course was inadvertently advertised under the University of London.

University of Glasgow

On July 19 the diploma in public health was awarded to the following:

Muriel S. Alexander, J. R. H. Berrie, G. S. Carrick, Flora C. Cowan, N. R. Cowan, Agnes C. Davidson, Katharin I. Kerr, Ruth A. Keymer, Duncan Livingstone, Margaret J. Macarthur, Duncan MacInnes, Ann K. MacLennan, James Maxton, Agnes W. O'Gorman, Martha G. Robson, Betsy D. Scott, Mendel Silver, J. M. Wallace, Elizabeth M. Whiteside, Jessie E. Wilson, T. S. Wilson.

Middlesex County Medical Society

The annual general meeting of this society will be held on Friday, Sept. 23, at 4 P.M., at the Edgware General Hospital, Edgware, Middlesex, when Dr. J. L. Hamilton-Paterson will speak on Focal Hypersensitivity as a Pathological Syndrome.

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1. Shipley, A. E. The Minor Horrors of War. London, 1915. More Minor Horrors. London, 1916.
2. Imms, A. D. Insect Natural History. London, 1947.
3. Sanders, E. An Insect Book for the Pocket. London, 1946.

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Sept. 13, at 4.30 P.M., in the anatomy theatre of the University of Edinburgh, Dr. D. P. Cuthbertson will speak on Metabolic Responses to Injury.

Abortion Law Reform Association

The annual general meeting of the association is to be held on Wednesday, Sept. 28, at 6 P.M. in the Conway Hall, Red Lion Square, London, W.C.1. At 7 P.M. Dr. Eustace Chesser will speak on Society and Abortion.

Remuneration of General Practitioners

A deputation from the General Medical Services Committee is to meet Ministry of Health officials on Sept. 23, to discuss the Ministry's report on the remuneration of general practitioners. The contents of the report have not yet been announced.

British Council for the Welfare of Spastics

Dr. Earl R. Carlson, medical director of the School of Corrective Motor Education, Long Island, New York, and Pompano Beach, Florida, will speak at 5 P.M. on Wednesday, Sept. 21, at 1, Wimpole Street, London, W.1. At the end of his address, the American film *A Day in the Life of a Cerebral Palsied Child* will be shown.

Medical Photography at Manchester

The exhibition of medical photography, organised by the medical group of the Royal Photographic Society of Great Britain (see *Lancet*, July 9, p. 65), is to be shown in the museum of Manchester Royal Infirmary (enter by the front lodge, Oxford Road) from Oct. 3 to 8. The exhibition will be open from 9 A.M. to 6 P.M. daily, and on Saturday until 1 P.M.

Institute of Psychiatry, London

On Wednesday, Sept. 14, at 5 P.M., Dr. Warren S. McCulloch, professor of psychiatry in the University of Illinois, Chicago, will speak on Neurological Organisation for Motion. On Thursday, Sept. 15, at 2.15 P.M., Dr. E. Gellhorn, professor of neurophysiology in the University of Minnesota, will speak on Emotion from the Physiological Viewpoint. Both lectures will be held at the Maudsley Hospital, Denmark Hill, S.E.5.

British Medical Association

The association will award the following prizes during 1950:

Sir Charles Hastings clinical prize (50 guineas) is offered for the best essay on observations and experiences collected by the candidate in general practice.

Nathaniel Bishop Harman prize for research in consulting practice (£100) is offered for the best essay submitted by a consultant member of the staff or senior hospital medical officer of a hospital in Great Britain or Northern Ireland who is not attached to a recognised medical school.

Further information may be had from the Secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1.

CORRIGENDA: *Royal Naval Medical Service.*—The note on this Service in the Students' Guide (Aug. 27, p. 392) erroneously stated that "medical and dental candidates must have had at least six months' experience in a house-appointment." This condition applies only to medical candidates.

Register of Speech Therapists.—In our issue of Aug. 27 (p. 400) this register, of which the 1949 edition has now appeared, was inadvertently referred to as the Register of Special Therapists.

Staph. aureus in the Nares of Children.—In Dr. Cunliffe's paper of Sept. 3 (p. 412), table IV should read as follows:

Age of child (days)	Maternal nasal carriage				λ^2
	Positive		Negative		
	No. of children	% carrying *Staph. aureus*	No. of children	% carrying *Staph. aureus*	
0– ..	12	*25·0*	8	*Nil*	0·8119
1– ..	22	*22·7*	17	*17·6*	0·0001
2– ..	26	*57·6*	12	*50·0*	0·0017
3–4 ..	18	*88·3*	11	*72·7*	1·1910

Appointments

ALMOND.—H. G. A., M.B., M.CH.ORTH. Lpool, F orthopædic surgeon, Liverpool eastern group and Hospital.

BRUNDRET, J. C., M.B. Manc., D.P.H.: senior pathol down Road Hospital, Liverpool.

CORBETT, H. V., M.D., M.SC. Lpool, M.R.C.O.G.: and gynæcologist, S and Child Welfare

CORDINER, ROBERT, M.B. Glasg., D.P.H., D.P.A.: phys tendent, County Infectious Diseases Hospital, In

*COOK, E. H. L., M.B. Lpool, D.O.M.S.: ophthalmic Albert Edward Infirmary, Wigan.

*CULLEN, C. H., M.CH. Belf., F.R.C.S., F.R.C.S.I.: orth Royal Albert Edward Infirmary, Wigan.

EASON, G. A., M.A., M.B. Camb., M.R.C.P., D.A.: a more Port Hospital.

ELLIS, G. R., M.A., M.D. Camb., M.R.C.P.: visiting senior St. Catherine's Hospital, Liverpool.

*GRACIE, A. P., M.B. Edin., F.R.C.S.E.: orthopædic Rochdale and District Hospital Centre.

GUNDERSON, R. W., B.SC. Lond., F.R.C.S., D.M.R.T.: to radiotherapy service of South-West Metrop Hospital Board's western area committee.

HUGHES, GOUGH, M.B. Lpool, D.A.: anæsthetist, Hospital.

JOHNSTON, E. A., M.A., M.B. Aberd., D.P.H.: ph tendent, Culduthel Infectious Diseases Hospital,

*LEDINGHAM, L. A., M.B. Aberd., M.R.C.O.G.: asst. o gynæcologist, Blackburn Hospital Centre.

LEES, ROBERT, M.D. Edin., F.R.C.P.E.: director, v centre, St. Luke's Hospital, Manchester, and venereal-diseases treatment clinic, Manchester Royal

LEVESON, IVAN, M.D. Lpool, D.P.M.: non-resident Smithdown Road Hospital, Liverpool.

LEVI, H. T., M.B. Leeds: pathologist, Bootle General and and District Hospitals.

LUCAS, H. K., M.B.E., M.B., M.CH.ORTH. Lpool, F.R.C orthopædic surgeon, Walton Hospital, Liverpool.

McCONNACHIE, J. S., M.B., B.SC. Aberd., F.R.C.S.: Rhymney and Sirhowy Valley group of hospitals

MACKINNON, N. A. M., M.B. Edin., D.P.H.: ve dermatologist to Northern Regional Hospital Board

MORLE, K. D. F., M.B. St. And., D.M.R.D.: junior Southport and Ormskirk areas.

OSBORNE, G. V., M.B., M.CH.ORTH. Lpool, F.R.C.S.E.: pædic surgeon, South Liverpool group of hospitals down Road Hospital.

PAUL, F. A., L.R.C.P.E., D.P.H.: physician-superinte Sanatorium and Infectious Diseases Hospital, St

PRYSOR-JONES, DAVID, M.B. Lpool, M.R.C.O.G.: junior and gynæcologist, Smithdown Road, Mill Road, and Hospitals, Liverpool.

VICKERS, H. E., M.B. Lond.: pathologist, Belmont Road Liverpool.

WAKELY, J. H., L.R.C.P.E., D.A.: anæsthetist, Clatterbridge Liverpool.

*WILSON, W. W., M.B. Manc., F.R.C.S.: asst. surgeon, Edward Infirmary, Wigan.

* Amended notice.

Births, Marriages, and Deaths

BIRTHS

CARNEGIE.—On Aug. 29, in London, the wife of Dr Carnegie—a daughter.

DODGSON.—On Aug. 30, in London, the wife of Dr. Michael —a son.

EDWARDS.—On Aug. 29, at Newbury, the wife of Dr. A. G —a son.

FRANCIS.—On Aug. 27, at Beckenham, the wife of Dr Francis—a daughter.

GOSS.—On Sept. 1, in London, the wife of Dr. David daughter.

KINDER.—On Aug. 30, in London, the wife of Dr. C. H. a son.

LUDLAM.—On Aug. 27, the wife of Dr. Martin Ludlam—a

PAGET.—On Aug. 27, in London, the wife of Dr. C. J. H a daughter.

PRIDIE.—On Aug. 24, the wife of Mr. Kenneth Pridie, f a son.

SAVEGE.—On Sept. 4, the wife of Mr. Ronald Savege, o F.R.C.S.E.—a son.

SUTHERLAND.—On Aug. 25, in London, the wife of Dr. Sutherland—a daughter.

MARRIAGES

C ug. 27, at Winchcombe, John Beckingham.

F Aug. 27, in London, Dennis Samoilys.

ug. 27, at Croydon, Robert John Lewin, M.B.

DEATHS

FULLER.—On Aug. 31, in London, Charles Arthur Fuller M.B. Lond., aged 80.

FULTON.—On Aug. 30, at Chadderton, Frederick Fulton.

HERNAMAN-JOHNSON.—On Sept. 3, at Carshalton, Fran man-Johnson, M.D. Aberd., F.F.R., aged 70.

WELLS.—On Sept. 2, at Sanderstead, Surrey, Harry Vernon M.B. Lond., F.R.C.S., aged 49.

WELPLY.—On Aug. 24, at Thurgarton, Notts, George Welply, M.B. R.U.I.

EEING THE PATIENT THROUGH

FAILURE OF MEDICAL COÖRDINATION

J. M. LIPSCOMBE
M.A., M.D. Camb., M.R.C.P.
STANT, CARDIOLOGICAL DEPARTMENT, ST. GEORGE'S
HOSPITAL, LONDON

into hospital and we will see you through."
ie wording of an unwritten contract between
nt and the world of medicine to which he
s himself.

ces himself unreservedly in "our" hands and
ed for investigation. The wheels turn, and the
y of diagnosis is geared to his needs. After
treatment.

ie is discharged from hospital; he comes down
back to life as it is really lived. What has been
After appendicectomy or tonsillitis the brief
f ill health is closed and may be forgotten. But
seldom as simple as that; too often the patient
self at home again unchanged, bewildered, and
disillusioned because the medical magic has
gnorant of what the investigations have shown,
doctors think, what the treatment has been or
what the outlook is in terms of life and health.
ause no-one has taken the trouble to explain the
l results of hospital investigation, to answer the
questions, or to put anxiety at rest. It is a
f medical coördination; time, money, and skill
en wasted.

THE HASH

ory, in greater detail, is a familiar one, capable
e variation:

, aged 44, consults her doctor because of abdominal
he symptoms are not quite straightforward; but,
Mrs. A is not obviously ill, Dr. B, as is his wont,
es with a palliative for three weeks. Mrs. A does not
and returns to the doctor. "Dr. B was on holiday,
to see his assistant, a foreign gentleman; of course
not know my case." There is a further period of
ing until the return of Dr. B, who then sends Mrs. A
pital appointment.

hospital a fortnight later—all except urgent cases
wait a fortnight for an interview—Mrs. A is handed
earing the name of Dr. X; she is seen by his clinical
, Dr. Y, whom she naturally supposes to be Dr. X.
year she nursed her sister, who was dying of cancer.
lost weight? Yes, a little. "Well, Mrs. A, I am not
ppy about this pain of yours; we ought to find out
out it. Come into hospital and we will see you
." By this time Mrs. A is not quite happy about her
er; a busy housewife with a husband to look after
boys living at home, she has not had time to bother
out her pain until now.

the waiting-list allows, she is admitted. In vain she
r familiar faces; there is no sign of Dr. Y, who was
oung man. (He is a clinical assistant and does no
t work.) She is questioned and examined by Dr. Z,
se-physician. The important gentleman who visits
Wednesday with great ceremony and a numerous
is Dr. X, the patients say; she now sees him for the
l last time. The mysteries are inaugurated—X rays,
als, blood-counts. After ten days she is told by Sister
for her clothes; Sister is always kind but unforth-
With warm farewells she leaves the ward on the arm
ix-foot son.

ome she is bombarded with questions that she cannot
She sits down to think, and realises that she is none
ser about her pain—her pain which she suddenly
ers is still there. Worried and disappointed she goes
Dr. B—*her* doctor. No, Dr. B has heard nothing.

Dr. B to the Registrar, Blank Hospital:

ar Sir,—My patient, Mrs. A, was discharged from your
ital three weeks ago. I should be very glad to have a
t of your findings. Yours &c.

Registrar, Blank Hospital, to Dr. B:

Dear Sir,—I enclose a copy of the summary of the case-notes of Mrs. A, as requested. Yours &c.:

"Mrs. A, aged 44. Admitted under Dr. X for investigation of atypical abdominal pain. No abnormal physical signs. Barium meal, cholecystogram, fractional test-meal within normal limits. Conclusion: No organic disease."

Dr. B conveys to Mrs. A the sense of this uninformative document by saying that nothing serious has been found, but the seeds of doubt have been sown and have begun to germinate.

Meanwhile Dr. Z, the house-physician, a careful and conscientious young man, is reviewing his cases and comes across the notes of Mrs. A; her problem unsolved, no conclusion recorded about her, no instructions about her treatment. To be on the safe side she had better be sent for to come to outpatients, just once, to make sure that nothing has been missed. Mrs. A and her pain return to the hospital and are ushered into Dr. Y's room. But Dr. Y has just got his Membership and passed on to higher things. There is a new doctor in his place. "Of course he does not know my case," thought Mrs. A, but was too polite to say so. The new doctor had to start again from the beginning because—the case-notes were lost . . . .

Do not smile at this sad history. In whole or in part it is enacted and re-enacted daily. Can anyone be blamed for such a dismal outcome? None is beyond criticism, yet none specially deserves it, because they are all worthy doctors.

It is a case of the failure of medical coördination. The doctors are individually beyond reproach; the facilities for meeting all the patient's needs are well conceived and well provided; the mechanism of investigation and diagnosis is smooth and rapid. Yet after ten days Mrs. A left hospital worse off than she was on admission.

THE INGREDIENTS

Let us consider individual responsibility in this miscarriage of medicine.

First Dr. B, the general practitioner. Doctors of the hospital world should be the last to cast a stone at the practitioner who shoulders so many burdens from which they themselves are exempt. If the callow houseman has sometimes been scathing over the telephone to an experienced practitioner, let it be a thorn in his conscience for ever. To Mrs. A's problem Dr. B applied the routine which pressure of time and experience had proved safe and economical. It might be objected that five minutes' conversation would have unearthed the phobia that was causing Mrs. A's pain to persist; perhaps it would. Yet, on average, Dr. B's routine is found to be safer—and certainly more economical in time—than exploratory talks with each patient.

The conduct of Dr. Y was beyond reproach. If he could not make a diagnosis on the evidence available in the outpatient department, his duty was to admit the patient to hospital for further investigation. This he did, with the magic formula, "we will see you through."

Dr. Z is an entirely admirable house-physician; but his very conscientiousness led him to sow another seed of doubt in the fertile mind of Mrs. A. He was thus an unwitting party to the miscarriage of medicine.

The stature of Dr. X places him beyond criticism. As a member of the senior staff, his medical commitments have steadily increased with the demands made on his time by advisory and consultative bodies. At his teaching hospital his function is to teach. He lectures and demonstrates to undergraduates; his postgraduate assistants he deliberately leaves to their own devices. They have the backing of his full confidence: it is his method and has stood the test of time. But by thus standing aside from intervention in the affairs of the patients nominally admitted under his care he may make a subtle contribution to the failure of medical coördination.

These are the characters in order of appearance. But surely somebody is missing from the list of dramatis personæ? Where is the first assistant? Why has he played no part in the affairs of Mrs. A? We have been deceived. The first assistant has seen Mrs. A, discussed her history with the house-physician, examined her on three separate occasions, scrutinised her X-ray films and summarised her case-notes—with perhaps rather a vague notion of whose notes he was summarising. Meanwhile he has been so busy teaching students, working in the outpatient department, supervising the follow-up clinic, and dictating letters to doctors that we have hardly noticed his existence.

THE RECIPE

This is a sorry hash to have made of such excellent ingredients. We need a good recipe for putting them to better use.

Coördination is the answer. But coördination is not a magic formula to be breathed over the successive stages of medical effort; it is a highly practical matter demanding the thought, work, and constant attention of all concerned. Let us consider the opportunities for coördination that offer themselves while the patient is in circuit from her doctor, through the hospital services, and back to her doctor again.

The Appointment.—Dr. B decides that Mrs. A must go to hospital for an opinion. He rings up for an appointment. A triangular relationship is thus established between doctor, patient, and hospital through the medium of its appointments-clerk. This official immediately becomes a person of consequence instead of a mere clerical automaton. Efficient appointments systems are becoming commoner, and the wheels turn more smoothly. It is desirable that patients should be seen within a week of their doctor's request—sooner if their condition warrants it. So long as practice falls short of this ideal, a system of priorities is needed, the smooth working of which hinges on good relationships between practitioners and hospitals; the appointments office is here the point of contact.

When Mrs. A keeps her appointment, the hospital should demonstrate that virtue with which it is too seldom associated—hospitality. This is now a fashionable topic, and we need only emphasise that a little hospitality at this point goes a long way to ensure a good relationship between patient and hospital and encourage coöperation rather than antagonism.

The Interview.—To Dr. Y, the clinical assistant, Dr. X, according to the teaching tradition of which he is a part, has delegated special powers, in the certainty that, having been through the hospital mill, he will not make many grave mistakes in handling his patients. He may yet commit two pardonable sins—over-caution and lack of frankness. Dr. Y cannot make a diagnosis; that very fact is his strongest weapon for persuading Mrs. A to come into hospital. Prestige is seldom lost by a confession of pardonable ignorance, and a frank statement of his position by Dr. Y will contribute generously to Mrs. A's smooth passage through her hospital admission. A letter to Mrs. A's doctor is the last, but not the least, important of Dr. Y's duties.

The Waiting-list.—This is a necessary evil. While it exists it is essential that it should be administered scrupulously and not haphazardly. For the waiting patient it means everything, and many good relations have been soured by clerical, even medical, indifference and maladministration. However the waiting-list is managed, its supervision must be a doctor's responsibility; the old days of control by ward sisters and lay clerks must, in fairness to those valuable people, never return. If admission is delayed, the patient should not be left high and dry in anxious speculation; a friendly phone call or a postcard will not strain the nation's finances. The difficulties of domestic rearrangement should always be remembered.

Admission.—The point of view of the patient to hospital has been vividly presented by a contributor to THE LANCET,[1] and we can add to that excellent description. But some relevant of the doctor-patient relationship in hospital are here in more detail. The patient is bewildered number of doctors who profess an interest in her each have their special functions, and there is no why the patient should not be admitted to the She will be more coöperative if she is kept inf the trend of events, of the reason for her adm the nature of the investigations or treatment planned; for her mind is uneasy in this strange ment, and she is deeply anxious about the outcome of her illness. Reassurance is th constant necessity. It is often years before the qualified doctor realises the value of reassurance even feels that it is an intellectually dishonest in the absence of a complete and negative inve but experience will teach him otherwise.

The patient will be particularly impressed by weekly round, with all its circumstance and retinue. Without any desire to teach "the chi job we venture to emphasise the immense pot for good or ill of this outstanding event. It is the students who hang on his words. Behind the "the chief" as teacher must find common gro "the chief" as medical director by combining lated laisser-faire with a shrewd instruction a patient's future. Thereafter his first assistant indeed be his *first* assistant, and not merely his by interpreting his wishes and making the con the patient's treatment and disposal his personal sibility. There is nobody else to do it. It is bey capacity of all but the most experienced hou and must therefore fall fairly and squarely on assistant's shoulders.

This continuity of approach and unanimity of should be fortified by ward conferences that contributions of ward sisters, almoners, and toward the object of building up a comprehensive of the patient in her environment. The more her discussed in common, the less divergence of op there be. Neither indecision nor lack of unanimity communicate themselves to the patient.

Discharge.—This is the crucial event for the yet it is seldom recognised as such. Instead, she given her ration book and a kindly *good-bye* and to drift out of hospital uninstructed and uninf A properly conducted discharge is potent for go should be formalised into a routine, almost a cer Each patient should be privately interviewed, no layman or a ward-sister, but by the first assistant, equivalent, who has had the supervision of the Only thus will continuity be maintained and the distilled from the hospital admission.

The farewell interview should be the occasion recapitulation of what has been achieved; the tion of results should be as full as possible and language adjusted to the patient's grasp. Inst about the future should be clear and decisive; if attendance is necessary, an appointment sho arranged; if not, this is the moment to break patient's dependence on hospital. There should be for questions and complaints, and all doubts sho removed from the patient's mind. The teaching ho where the patient's discharge is often haphazard unorganised, have much to learn from the more cratic rule of the medical superintendent, who formalise the occasion into a time for focusing events and tying up loose ends. There is an analog

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1. Two Hospitals, by a patient. *Lancet*, 1948, ii, 7
2. See Armstrong, T. G. *Ibid*, 1946, ii, 480.

y discharge parade, which, for all its inadequacy
e, carries the germ of an invaluable system.
low-up.—This is the joint concern of hospital
tioner. Both are interested in the patient's future,
lifferent points of view. Continuity of treatment
n their deliberate acts of collaboration.
ctitioner depends on the hospital for an account
ent's admission. The framework of an adequate
information is usually in being, but its practical
entirely dependent on the imagination and
n of those who work it. A summary of the
is sent; too often this communication is
eless, uninspired; the wording is impersonal,
tive; it carries a flavour of dead routine, and
of genuine interest in the particular personal
to be found in it; no effort is made to establish
elationship between hospital and practitioner.
value the document may have it loses by
eeks after the patient's discharge from hospital.
a wide field for fruitful reform, not so much
sting machinery as of the attitude of mind of
work it. Again the burden, in the teaching
at any rate, falls on the shoulders of the first
; he alone can provide the bridge between hos-
tment and aftercare. As his chief's representa-
entitled to support and encouragement from
houldering this additional burden in a busy life.
uct of the follow-up clinic will be his respon-
nd a nice balance must be struck between the
nd physical well-being of the patient and the
nts of clinical research.

actitioner's Part.—The practitioner must play
n "seeing the patient through" after discharge
pital. This may consist, perhaps, of further
tion of the hospital's findings, with guidance
urance, of social adjustment and practical advice
s or domestic problems, or of the provision of
eatment. These take time, and the practitioner's
rce; yet time spent on cases that have got so
ly to be time well spent and may even be an
against the wastage of future return visits that
avoided if the value of the hospital admission
italised to the full. Hospital receives patient
tor and returns him to doctor, but the circle is
te unless the doctor plays an active part in
it off. The best of hospital efforts can be
too many conscientious reports are consigned
the filing-cabinet or even the waste-paper basket.

THE "BIRD-OF-PASSAGE" SYNDROME

eresting syndrome may be recognised in out-
lepartments, especially those of postgraduate
hospitals. Many will find the details familiar
see in the unexceptionable Dr. Y an innocent
nt in another medical miscarriage.

r of Dr. B's patients keeps her appointment at
linic. "The chief," with a class of students on his
ances briefly at the doctors' letters of introduction
gns the less promising patients to his clinical assis-
r. Y does his conscientious best, fails to elucidate
toms, judges quite rightly that admission to hospital
ssary, and initiates certain investigations. While
in progress, Dr. Y is admitted M.R.C.P. and elevated
heres of activity. His successor, Dr. Q, is as puzzled
uivocal results of Dr. Y's investigations as by the
symptoms; some vague central-nervous signs and
certainty about the fundi suggest the wisdom of a
logical examination to solve the problem of headache
the sphygmomanometer and electrocardiogram have
ttle light. The patient's growing anxiety is quelled
e with phenobarbitone. By a happy intervention of
e—happy for the patient—Dr. Q is laid low with
on the occasion of her next visit, and the chief,
fed, intervenes, not a moment too soon, with a
mopping-up operation, and rescues the patient from the slippery slope that leads to the department of psychiatry.

Autocracy is the only direct remedy for this state of affairs, but an undesirable one. A threefold alternative is suggested; first, the birds-of-passage themselves should be encouraged to cultivate an awareness of the dangers inherent in their office which may lead in all innocence to such unhappy results; secondly, "continuity of doctor" should be recognised as an essential rule of outpatient organisation and striven after whenever possible; thirdly, the traffic of difficult cases between clinical assistants and their chief should be facilitated by personal contact and after-the-clinic conferences.

CONCLUSION

This is not an account of every possible cause of breakdown in medical organisation, nor are all possible remedies suggested; but the picture drawn, if a little exaggerated in parts, may stimulate others to contribute from their own experience.

It is submitted that the full value of applied medicine is being lost through a failure of coördination. Medical technique and organisation are constantly improving, but the cement required to bind them into an effective whole is often lacking. If medicine is not to fail in its application, there must be better coördination at all levels. This can be achieved within the existing framework because it calls only for a change of attitude and a new awareness on the part of all the doctors concerned.

The "registrar class" will be aware that the lot must fall on them. Within the teaching-hospital framework, at any rate, this is the only possible solution. They are already a hard-worked, if not overworked, class, and there may be no room in their time-tables for the business of coördination as described above. In that case rearrangement of their duties and even an increase in their numbers may need to be considered. But they will do the job.

Who will take the lead in initiating this change of outlook and of practice? We look to our seniors to provide the directives and the inspiration. There must be such a change if we are to fulfil our pledge and "see the patient through."

I am indebted to Dr. Alastair Hunter for many stimulating thoughts on these topics and for the original sketch and title of the "bird-of-passage" syndrome.

TENSILE STRENGTH OF SUTURES

I. THE B.P.C. METHOD OF TEST

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THIS paper presents observations on the standard method of testing the tensile strength of sutures as laid down in the *British Pharmaceutical Codex* (1946). It proposes a modification which would help the surgeon to choose a suture with an effective tensile strength comparable to that of the tissue in which it is to be inserted.

B.P.C. METHOD

The Tensiometer

The *B.P.C.* specification for the tensiometer is as follows:

> "The machine for determining the tensile strength shall be of the dead-weight type having a constant rate of traverse of the movable jaw of 12 inches per minute and of a capacity such that, when the specimen breaks, the angle which the pendulum arm makes with a vertical line is between 9° and 45°. The clamps shall be of such design that not more than 25% of the specimens in any lot tested break at a point within 0·5 inch of either of the clamps." (*B.P.C.* Suppl. vi, 1944.)

Methods of Testing

Two methods of testing the suture on the tensiometer are used—the "straight pull" method and the "knot" method.

(1) In the "straight pull" method each end of a single strand of the suture is placed in the clamps, and the ends are gradually distracted until the suture breaks. The strain in pounds at the time of fracture is read off a calibrated scale.

(2) In the "knot" method a surgeons' knot—i.e., a square knot with a double turn on the first throw—is tied in the middle of a strand of the suture, the ends of the suture are clamped, and the test proceeds as before.

The value for the straight-pull strength is always *greater than that for the knot strength, in the rough* proportion of 100 : 70, because some of the fibres of the suture fracture at the acute kinks of the knot.

COMMENTS ON *B.P.C.* METHOD

A brief consideration of the two standard methods of suture used in *surgery—interrupted and continuous*—shows that in tissues a suture is never called on to bear the type of strain to which it is submitted in the *B.P.C.* test.

Interrupted Suture.—An interrupted suture is a loop of suture material completed with a knot, and in a wound the fracturing strain operates from within the loop. It is likely on theoretical grounds that the force required to break the loop will be considerably greater than that required to break either the single strand or the knotted strand. In fact, if the frictional resistance is zero, the strength of an interrupted suture should be equal to the sum of the strengths of a single strand and a single knotted strand.

Continuous Suture.—A continuous suture is a single strand of suture material anchored at each end of the wound with a knot. Except in contractile viscera the length of wounds varies but little, and it is clear that the chief stress on the suture is not in the longitudinal axis of the suture as it is in the tensiometer. In the standard abdominal incision the chief strain will doubtless be at an oblique angle to the suture. But the analysis of the site of greatest strain in a continuous suture and of the

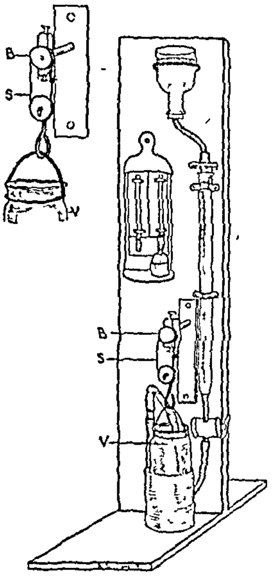


Fig. 1—Tensiometer described in text for testing tensile strength of sutures: B, fixed beam; S, suture; V, vessel. Strain is gradually placed on suture by increase of weight of mercury in vessel, which is filled by gravitation at relatively constant speed from burette. Method of applying suture is illustrated in small figure.

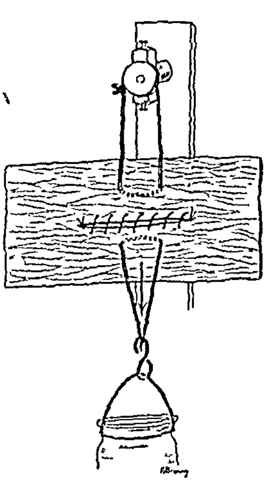


Fig. 2—Method of testing tensile strength of continuous suture. Greatest strain is applied at centre of incision, thus imitating greatest strain in operation wound.

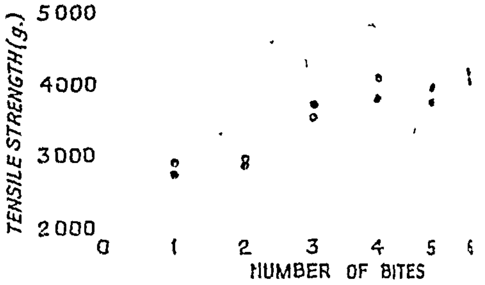


Fig. 3—Increase of effective tensile strength of continuo relation to increasing number of bites.

quantity of the strain is exceedingly complex to take into account such factors as friction, wound length, and the number of bites.

NEW METHOD OF TESTING

In the Wilkie Surgical Research Laboratory *tested the tensile strength of sutures* with an which consists essentially of a fixed beam, B

TABLE I—MEAN TENSILE STRENGTHS OF SUTURES BY *B.P.C.* METHOD OF "STRAIGHT PULL" AND STRAND" AND AS INTERRUPTED SUTURES

Suture material	Diameter (mm.)	Mean tensile strength in		
		B.P.C. method		Interrupted suture
		Straight pull	Knotted strand	
Silk	0·22	947	650	1402
Cotton	0·21	1187	826	2132
Linen	0·21	1892	1010	2562
Nylon	0·19	882	620	1332
Stainless steel ..	0·16	1452	1180	2571
Tantalum ..	0·08	376	300	630
Silver	0·15	997	600	1492

vessel, V, of known weight into which mercury run from a calibrated burette (fig. 1). The be tested was fixed to B and V, and, as the me into V, a strain was gradually placed on the which increased in proportion to the volume of in V. When the suture snapped, the stopcock burette was closed and the reading *taken.* The strength of the suture in grammes was taken to

T.S. = Vol. of mercury in ml. × 13·5 + wt. of V in g

When a continuous suture was to be tested inserted into a piece of leather in which an inci previously been made. The edges of the inc distracted by fixing two stout loops of heavy equidistant points of 1 cm. from the centre of the in distraction was then applied as before (fig. 2).

RESULTS

The mean tensile strength of a single unknotted of fine silk (calibre 0·17–0·2 mm.) was 947 g. Wh same suture was tested with a surgeons' knot tied middle, the mean tensile strength was 650 g of the former value). The mean value for an inte suture of the same material was 1402 g., or sligh than the sum of the first two values. Similar res noted for sutures of cotton, linen, 'Nylon,' stainles tantalum, and silver (table I).

When a *specimen of fine silk* was tested as a con suture, remarkable results were found (table II mean tensile *strength of the suture,* when seve of tissue were taken, was 4735·6 g., or about ten the "knot" strength of 488 g. When only two were taken, the mean tensile strength was still or six times the "knot" strength (fig. 3).

DISCUSSION

ults indicate that the tensile-strength values
y the *B.P.C.* may mislead the surgeon in the
suitable sutures. There is little doubt that
ign material left in a wound, the more readily
will the wound heal. It is therefore desirable
finest sutures which have the tensile strength
o hold the tissues. In the case of unabsorb-
s it would be reasonable to use material of
same tensile strength as that of the tissue

ENSILE STRENGTH OF SILK SUTURE TESTED BY
'STRAIGHT PULL" AND "KNOTTED STRAND"
AS AN INTERRUPTED SUTURE, AND AS A CON-
UTURE OF SEVEN BITES

Tensile strength (g.)			
.*C.* method		As suture	
ll	Knotted strand	Interrupted	Continuous
	516	1197	5574
	542	999	4724
	447	1046	5124
	583	958	4752
	502	1082	5234
	502	1095	4014
	461	1082	5110
	447	1266	4032
	447	1346	4374
	433	1012	4416
	488·0	1108·3	4735·6

the standard "bite" of a stitch, say 1 cm.
se of absorbable sutures the loss of tensile
ue to digestion by tissue must be taken into
nd a suture considerably stronger than a
e amount of tissue would be necessary. An
on of the tensile strength of the various
he abdominal wall along these lines is reported
mpanying paper.
ile it is suggested that the *B.P.C.* methods of
tensile strength of sutures tend to make
se much too heavy suture material. Thus,
e knot strength of 2/0 catgut quoted by the
2·5 lb. (1·13 kg.) the strength of a single inter-
ture is 7 lb. (3·18 kg.). In the case of no. 2
B.P.C. figure is 6·5 lb. (2·95 kg.), whereas
le interrupted suture the measured value is
(8·63 kg.).
ficulty could be immediately overcome without
on of existing equipment if the knotted loop
for testing instead of the knotted strand. If
were clearly printed on the label within the
the surgeon could tell at a glance the tensile
f a single interrupted suture of any material.

SUMMARY

itish *Pharmacopœia Codex* method of testing
le strength of sutures consists of applying
traction by a tensiometer either to the ends of
trand or to the ends of a strand in which a
knot has been tied; the distraction is con-
til the suture breaks. In the first instance the
termed "straight pull" strength and in the
knot" strength.
of these values represents the effective strength
e suture as used in surgery. In the case of an
ed suture the effective tensile strength is over
B.P.C. knot strength. In the case of continuous
he effective tensile strength may be up to ten
B.P.C. knot strength.
is made for the adoption of the knotted loop
the tensile strength of sutures. This would
surgeon a direct value for a single interrupted

TENSILE STRENGTH OF SUTURES

II. LOSS WHEN IMPLANTED IN LIVING TISSUE

D. M. DOUGLAS
M.B.E., Ch.M. St. And., F.R.C.S.

THE use of unabsorbable suture material for the repair of large, direct, or recurrent herniæ has become increasingly popular (Maingot 1941, Edwards 1943, Douglas 1948, Moloney et al. 1948, Abel and Hunt 1948). It is obviously a matter of some importance to determine whether these sutures contribute permanent strength to a repair, and the present study was undertaken to investigate this point in the case of silk, linen, cotton, 'Nylon,' silver, tantalum, and stainless steel.

METHODS

Specimens of the sutures to be studied were tested in the dry state for tensile strength with the apparatus already described (Douglas 1949). The suture was in the form of a loop, completed by a surgical knot with the ends left long. During the test the suture broke almost invariably at or immediately adjacent to the knot. Lengths of the sutures were next implanted subcutaneously in the abdominal wall of rabbits, and the animals were killed with chloroform at monthly intervals. The sutures were carefully removed from the dead animals, dried, and tested for tensile strength as before.

There are two obvious sources of error in this method:

Variations in Tensile Strength.—Suture material varies considerably in tensile strength from strand to strand and even at different parts of the same strand (table I). This is particularly the case in the organic suture materials, the specimens of linen showing variations of 1104 g. from strongest to weakest. The metallic sutures are more uniform. To rule out errors from this source it is clearly necessary to submit a series of sutures to test and to have a large number of controls.

Water Content.—Organic suture materials lose tensile strength when moist, and it is therefore necessary to dry the sutures carefully after removal from the animals. This was done by placing the sutures in envelopes and keeping them at a temperature of 95°F for twenty-four hours. Note was made of the wet-bulb and dry-bulb reading at the time of the test, but readings were all within the *B.P.C.* range. It was impossible to be sure that the water content of the sutures after drying was the same as that before implantation, but, so far as possible, errors from this source were eliminated.

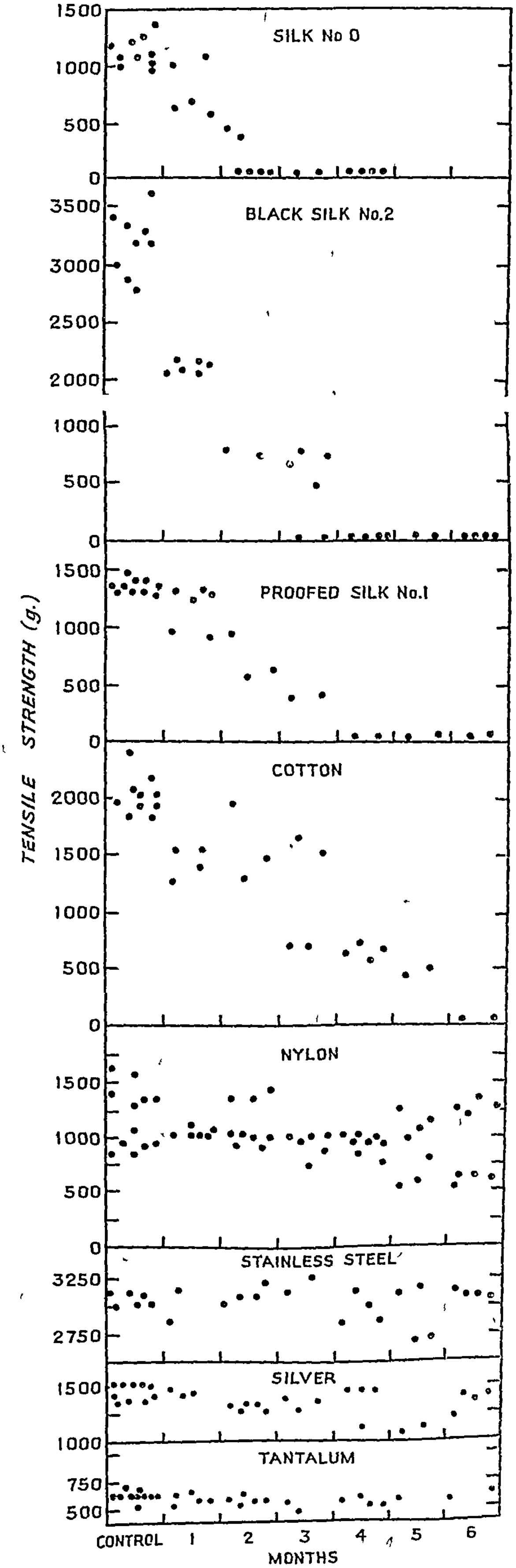
ORGANIC SUTURES

The results after implantation in living tissue are given in table II and the accompanying figure.

Silk.—Three types of silk sutures were tested: a no. 0 and a no. 2 unproofed silk and a no. 1 proofed silk suture. Both specimens of unproofed silk lost tensile strength rapidly in tissues and by the end of the second month retained only 13–20% of the original strength. By the end of the fourth month both specimens were so weak that they broke into small fragments when they were removed. The proofed silk retained its tensile strength slightly longer than the unproofed specimens. At the end of the fourth month it still retained about 30% of its original strength. However, each specimen which had been in tissue for over four months broke into fragments when removed.

Cotton.—Two specimens of cotton sutures were tested labelled "cotton no. 36" and "cotton no. 40." Little difference either in tensile strength or in calibre was found between the two, though they were supplied as different suture materials. Both lost tensile strength rapidly and at about the same rate as silk. By the end of the sixth month neither specimen retained enough tensile strength to be of value in a repair.

Linen.—The specimen of linen tested was labelled "linen 90" and had a calibre of about 0·21 mm. It had a tensile strength somewhat greater than that of silk and cotton of comparable size. Though it had lost tensile strength rapidly, at the end of six months it still retained about 30% of its original strength. At the end



Effect of implantation in living tissue on tensile strength of sutures. Each point indicates one test.

of the eighth month, however, its tensile fallen to 420 g. (15% of the control value)

SYNTHETIC AND METALLIC SUTURES

Nylon.—The nylon sutures tested sho variation in tensile strength. Control rea specimen labelled " Nylon no. 1 " varied fr 1612 g., and those in " Nylon no. 2 " varied to 1082 g. With this great overlap there was in regarding them as different sutures, and are presented together. Up to the end of t month no loss of tensile strength was dete the fifth month four of the specimens sho below the control range, and at the end of month four of the specimens showed a clear fal strength, while four were unaffected. The v noted in this group are no doubt due to original in tensile strength, but it is clear that the nylon is much less affected by tissues than is the of the organic sutures. At the end of the the mean tensile strength was 84% of the co

Stainless Steel, Tantalum, and Silver.—The sutures may be considered together. They all more uniform tensile strength than did the o materials, stainless steel and tantalum being constant in this regard (table I). Tensile s not appreciably affected in these suture six months' implantation in tissue. The m strength of stainless steel in the control s 2572 g., and the same value after six months was 2601 g. The values for tantalum were 628 g

DISCUSSION

Two aspects of this study merit some disc unsatisfactory state of numbering of sutures remarkable fact that a fairly heavy silk suture rapidly weakened in tissue until at the end of fo it has lost all its tensile strength.

Numbering of Sutures

The practice of labelling sutures with num doubt to give the surgeon some guide to the If this is so, manufacturers could not easily have a more confusing situation than exists at pr example, no. 1 nylon, silk, and catgut have diameters of 7, 9, and 23 thousandths of (0·18 mm., 0·2 mm., and 0·58 mm.). In th metallic sutures the position is even more since these are supplied according to the stan gauge, in which a diameter of 0 009 inch ((corresponds to a S.W.G. value of 34.

The most reasonable way of numbering sutu be to quote the diameter in thousandths of an i a suture of a calibre of 7 thousandths of an i have the number 7, whatever its compositi corresponds in size to catgut no. 5/0. A su calibre of 20 thousandths of an inch—e.g., ca —would have a number 20. Since it is only ve tionally that sutures of less than 3 thousand inch or greater than 30 thousandths of an required in surgery, the whole range of surgic whatever their composition, could be covere numbers 1, 5, 10, 15, 20, 25, and 30. The surg then know that any suture ordered as no. 15, wo diameter of as near 15 thousandths of an inch as manufacturing skill could achieve. The *B.P* a range of 3–4 thousandths of an inch in eac

This, then, would be a rational method; manufacturers and surgeons are on the whole tive in outlook, a compromise might be more a If all suture material were labelled accordi *B.P.C.* specifications for catgut, a more position would result. Silk no. 1 would then b 4/0, nylon no. 1 5/0, linen no. 90 4/0, and bewildering situation would be converted into though illogical, would be relatively simple to u

ENSILE STRENGTH OF TEN CONSECUTIVE SPECIMENS OF VARIOUS SUTURE MATERIALS SHOWING VARIATIONS FROM STRAND TO STRAND

Type	Diameter (mm.)	Tensile strength (g.)									
		Specimen									
		1	2	3	4	5	6	7	8	9	10
No. 0 unproofed	0·16	1197	999	1046	958	1082	1095	1082	1266	1346	1012
No. 1 proofed	0·22	1373	1432	1373	1469	1399	1332	1348	1266	1362	1318
No. 2 unproofed	0·28	3437	3332	2894	2712	3292	3222	3236	3752	3372	3346
No. 36	0·21	1848	2444	2148	2232	1969	2178	2430	1955	1983	2322
No. 40	0·22	1941	2410	2037	2009	2065	1941	1834	1834	2294	1910
90	0·21	2754	2602	2148	2444	2616	1969	2472	2280	1910	1650
1	0·18	1612	1564	1373	1032	1134	1106	944	1201	1243	1348
2	0·19	852	1058	917	944	958	866	958	944	1082	998
39 S.W.G.	0 15	1542	1528	1542	1514	1399	1501	1362	1446	1348	1446
..	0 08	622	622	622	608	622	650	664	622	622	622
39 S.W.G.	0·15	2560	2518	2532	2504	2518	2616	2532	2603	2544	2644

ile Strength in Silk Sutures

ıgs in the case of the organic sutures were since it is generally believed that a darn of the repair of hernia forms a permanently ework for a repair by fibrous tissue. The ate that, even in the case of a moderately reliance cannot be placed on its power to train after two months; linen and cotton any, better in this regard. The loss of tensile no doubt the result of a combination of cir-; the moist environment and the action of nts and histiocytes may be cited as some rs probably involved. But, whatever the ffect is clear: of the organic sutures tested ontribute permanent strength to a hernial

llic sutures, on the other hand, were as removed at the end of six months as when nserted. There is good evidence, therefore, materials can offer a strong and long-lasting for the growth of fibrous tissue in a hernial ided that they do not undergo fracture from ning.

ion of nylon is almost as good as that of the tures, though the great variations in tensile ake it a somewhat unpredictable material to Not being subject to work-hardening, it has vantages over metallic sutures for hernial uch mobile parts of the trunk as the epigas- m having a fine nylon mesh prepared which erior to tantalum mesh in the repair of these erniæ.

SUMMARY

of unabsorbable sutures commonly used in of hernia were implanted in the abdominal nals. At monthly intervals they were removed for tensile strength.

nic suture materials—silk, cotton, and linen— strength rapidly after the second month, and by the sixth month were either disintegrated or so weak as to have little power of reinforcing a defect.

In contrast, the synthetic material nylon and the metallic sutures—stainless steel, tantalum, and silver—lost little tensile strength, and at the end of six months were on the whole as strong as when inserted.

This evidence is taken to indicate that the organic suture materials cannot contribute strength to a hernial repair for longer than a few months, whereas sutures of nylon, silver, tantalum, and stainless steel may form a strong and long-lasting scaffold upon which the essential repair of fibrous tissue may develop.

EFFECT OF IMPLANTATION IN LIVING TISSUE ON TENSILE STRENGTH OF SUTURES

	No.	Approx. diameter (mm.)	Mean tensile strength (g.)						
			Control	Months					
				1	2	3	4	5	6
..	0	0·16	1102	783	151	0	0	0	0
d)	1	0 22	1402	1186	724	463	0	0	0
..	2	0 28	3279	2076	749	438	0	0	0
..	36								
..	40								
..	90								
..	1 and 2								
..	39 S.W.G.								
..	..								
eel	39 S.W.G.								

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INCIDENCE OF
PENICILLIN-RESISTANT AND STREPTOMYCIN-RESISTANT STAPHYLOCOCCI IN A HOSPITAL

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Barber (1947a and b), in studies on the occurrence of penicillin-resistant coagulase-positive staphylococci in patients in a London hospital, showed that the incidence of resistant strains rose from 14 to 38% in a year. Subsequently (Barber and Rozwadowska-Dowzenko 1948) the incidence rose to 59 in 100 cases. In the latter series there was evidence that a proportion of the resistant strains had come from patients infected in hospital. Streptomycin sensitivity tests were carried out on the last series of 100 strains, and 1 strain showed a resistance greater than that of the control Oxford strain.

It is well established that as many as 60% of normal people may be nasal carriers of coagulase-positive staphylococci, but less is known about the incidence of penicillin-resistant strains among such carriers. Voureka and Hughes (1949) examined 315 strains of staphylococci obtained from the noses of outpatients attending an asthma clinic and found 24 (7·6%) which were resistant to 1 unit of penicillin per ml. Of these strains 14 were coagulase-positive; 11 strains produced penicillinase; 13 did not, but it is not stated whether these were coagulase-positive or coagulase-negative strains. Martin and Whitehead (1949), who examined 50 medical students and laboratory workers, found a carrier-rate

Dr. Robert [illegible] Library

of 62% for coagulase-positive staphylococci; 6 (12%) of this group were carrying penicillin-resistant strains.

Observations made in the routine bacteriology laboratory of this hospital during the first nine months of 1948 suggested that many strains of *Staph. pyogenes* * isolated from various clinical conditions were penicillin-resistant. It was therefore decided to examine for penicillin sensitivity and phage type all strains of *Staph. pyogenes* isolated. As streptomycin was then just becoming readily obtainable for treatment, it was decided to test the strains for sensitivity to this antibiotic to obtain basic data for future comparisons.

The findings from October, 1948, to March 31, 1949, are here reported, together with observations on the nasal carrier-rate of *Staph. pyogenes* in the hospital staff and in an unselected group of the general population.

METHODS

Nasal swabs were taken with swabs moistened with a little nutrient broth. All material was inoculated directly on to blood-agar plates. Except where there were obvious differences in colony morphology or in hæmolytic activity, single colonies only were picked from each plate for coagulase tests, sensitivity tests, and phage typing. Coagulase activity was determined by the slide method of Cadness-Graves et al. (1943) or by the tube method. Phage typing was done by the method of Wilson and Atkinson (1945), except that the phage types are now designated by the phages to which they are susceptible. Sensitivity tests to the antibiotics were made by the streak method on blood-agar plates in the centre of which had been placed sterile discs of filter-paper to which were added 20 units of penicillin or 2 mg. of streptomycin. Control cultures of sensitive strains Oxford H or 313 were included on every plate. In the case of penicillin the strains were recorded as resistant if growth took place to the edge of the paper disc or to within 1 mm. of it. Some strains were encountered which were more resistant to streptomycin than was the control culture, but in no case did such strains grow up to the edge of the disc. Additional penicillin-sensitivity tests were made by the tube method with selected strains, large inocula of 0·1 ml. of a 1 in 100 dilution of a 24-hour broth culture being used.

RESISTANCE TO PENICILLIN AND STREPTOMYCIN OF STRAINS ISOLATED FROM PATIENTS

We examined 228 strains of *Staph. pyogenes* isolated from 196 patients. The resistance of these strains to the two antibiotics, the number of patients from whom they were obtained, and the number of phage types to which they could be assigned were as follows:

Antibiotic resistance	*No. of patients*	*No. of strains and % of total*	*No. of phage types*
Penicillin-sensitive ..	104 ..	107 (*47%*) ..	38
Penicillin-resistant ..	92 ..	121 (*53%*) ..	21
Streptomycin-sensitive ..	189 ..	216 (*95%*) ..	46
Streptomycin-resistant ..	7 ..	12 (*5%*) ..	6

Penicillin.—From 104 patients 107 penicillin-sensitive strains were isolated, and from 92 patients 121 penicillin-resistant strains were obtained. Thus 47% of strains were penicillin-sensitive and 53% penicillin-resistant. It will be noted that the ratio patients/strains was larger in the penicillin-sensitive than in the resistant group. This was because some of the resistant strains were obtained from surgical patients who had been long in hospital and had been swabbed more often. If the incidence of penicillin-resistant strains is calculated on the basis of patients rather than of strains, the figures are 47% of patients infected with penicillin-resistant strains and 53% infected with penicillin-sensitive strains.

Streptomycin.—Only 12 strains of streptomycin-resistant *Staph. pyogenes* were found in 228 cultures. These strains came from 7 patients. In 6 the mycin-resistant strain, which was of the same type as the original streptomycin-sensitive appeared after streptomycin therapy. The 7th had a cross-infection and had received no s

PHAGE TYPES OF STRAINS ISOLATED FROM P

Early in the investigation it was found that a able number of the penicillin-resistant strains react with any of the phages of Wilson and (1945) series. However, a phage was ob adaptation of phage 31 which proved of great identifying these strains. It is a citrate-sensi belonging to serological group B (Rountree lyses strains which are sensitive to phage 7 large number of strains which are insensitive to This phage is provisionally called 31b, and by it are called type 31b.

The number of phage types differentiated 107 penicillin-sensitive strains was 38, with no type predominating; 30 strains (28%) were not with the available phages. The phage types 121 penicillin-resistant strains were as follows.

Phage type			*No. of strains and % of total*
31lb. ..	..	..	50 (*41%*)
7/42b/47c	..	..	22 (*18%*)
6/47 ..	..	..	7 (*6%*)
42b/47c ..	..	..	6 (*5%*)
7/47 ..	..	..	6 (*5%*)
15 other types	..	..	19 (*16%*)
Non-typable	..	..	11 (*9%*)
Total	..	..	121

11 strains (9%) were not typable with the phages. 75% of the resistant strains were a for by 5 phage types. The balance of 19 strains to 15 types. Type 31b was the predominant being isolated on 50 occasions from 38 patient 7/42b/47c came next in frequency, 22 culture obtained from 11 patients.

PENICILLIN-RESISTANCE IN RELATION TO PE THERAPY AND ORIGIN OF INFECTION

The case-records of the patients from whom resistant strains were recovered have been for information on the nature of the stap infection, its probable origin, and the relati penicillin therapy. In one case, that of an ou no history was available. 91 cases have theref classified in the following way.

If the resistant strains were isolated from p material obtained at the first examination of the after admission to hospital and before instit penicillin therapy, the infection was consi primary. Cases were regarded as having be infected in hospital when the resistant organis obtained from such situations as surgical sinuses, burns, or urine, which had previously s signs of infection, or had been infected with organisms or with a different phage type of lococcus. In 16 cases the data available were in to allow with certainty an assessment of the of the infection, and these are classified as of u origin. In 4 cases there was evidence of conve the strains to penicillin-resistance during therapy were 5 cases in which the strains were isolated routine examination of nose or throat swabs symptomless carriers. The case-records are as follows:

Origin of infection		*No. of cases*		*Penicillin ther isolation of re*
Primary	..	12	.. ..	0
Hospital cross-infection	..	54	.. ..	39
Conversion during treatment	..	4	.. ..	3
Symptomless carriers ..	..	5	.. ..	0
Uncertain	..	16	.. ..	12
Total ..	..	91		54

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* In using the name *Staph. pyogenes* we follow Cowan and Shaw (1949) in meaning coagulase-positive staphylococci which may or may not produce pigmen

n was considered to be primary in the following

Type of infection	*No. of cases*
Otitis	3
Carbuncle	1
Abscess	2
Cystitis	1
Paronychia	1
Infection of hands	2
Infection of carcinoma of skin	2
Total	12

of these infections developed in nurses there 8 cases in this series of 196 in which infection cillin-resistant strains took place with certainty ie hospital.

4 cases probably cross-infected in hospital the greater part of the material. Of the 39 who had received penicillin before isolation of ant strains, 30 had infected surgical wounds, as the 15 who had not been treated with penicillin. 0 surgical patients who had received penicillin ant organisms were isolated at the first swabbing, done when wounds showed signs of breakdown harge of pus, or because of delayed healing. nsidered that such cases were infected with a lready penicillin-resistant at the time of its to the wound, and that the resistance had not d as the result of penicillin therapy of the concerned.

ncidence of phage types in the 54 cases of cross- was as follows:

Phage types	*No. of cases*
6/42b/47c	1
7/42b/47c	6
31/42d	1
31a/31b	1
31b	31
42b/42e	1
42b/47c	4
42d	1
42e	1
47	2
47/47a	1
Non-typable	4
Total	54

be observed that 31 (57%) of the strains belonged 31b. Some of these type 31b strains were tested cillin resistance by the tube method. All produced nase and grew in concentrations of 200–500 units cillin per ml. It is therefore obvious that even oses of penicillin will not control infection with rticular strain. There can be no doubt that these in-resistant strains are fully pathogenic. In one oss-infection of a mastoidectomy wound with a lb strain was followed by a cerebral abscess with sult.

cases of uncertain ætiology included 5 patients nfection of the lungs, who had received penicillin isolation of the resistant strains. Of the 4 patients d received no penicillin, 3 may have been infected pital; they had pyoderma, conjunctivitis, and opneumonia, all infected with the type 31b strain.

CARRIER-RATE IN HOSPITAL STAFF AND GENERAL POPULATION

ing established that a large proportion of penicillin- nt strains were being isolated from patients cross- d in hospital, and that two phage types (31b /42b/47c) were the predominant organisms in these ions, we investigated the nasal carrier-rates of strains in the hospital staff.

February a survey was made of the nurses and rs. 200 nasal swabs were taken, 187 from nurses 3 from resident doctors. These people were distri- throughout the hospital, 17 wards being sampled. complete nursing staff of the operating-theatres wabbed, but in other wards only a sample of the was swabbed.

The results of this survey showed that a control group of the general population should also be examined. It was thought desirable to obtain a randomised sample rather than a homogeneous group of preclinical year medical students or of hospital outpatients. Through the courtesy and cooperation of the director of the Red Cross Blood-Transfusion Service we were allowed access to an ideal control group in the blood donors. These people do not visit the hospital to give their blood and are drawn from all classes of the community and from many parts of the city. From these blood donors 200 nasal swabs were therefore taken.

The results were as follows:

	Numbers swabbed	*Carriers of Staph. pyogenes*	*Carriers of penicillin-resistant strains*
Hospital staff	200	105 (*53%*)	64 (*32%*)
Blood donors	200	90 (*45%*)	8 (*4%*)

Among the hospital staff 105 people yielded *Staph. pyogenes*, a carrier-rate of 53%. The carrier-rate of the blood donors was 45%. There is no significant difference in these rates. When, however, the figures for penicillin-resistant strains are examined, a striking difference is observed. In the hospital staff 64 of the 200 showed penicillin-resistant strains, a carrier-rate of 32%, compared with 8 among the 200 blood donors, a rate of 4%. This difference is highly significant. ($\chi^2 = 53{\cdot}12$: $P < 0{\cdot}001$).

If the nasal carrier-rate of the hospital staff is converted to a percentage of the 105 carriers of staphylococci, 61% of carriers had penicillin-resistant staphylococci in their noses.

The phage typing of these nasal strains also yielded results of considerable interest. The penicillin-sensitive strains belonged to many phage types, with a large percentage (31%) of non-typable strains. Many of these non-typable strains, though coagulase-positive, were poor pigment producers. The distribution of phage types among the penicillin-resistant strains was as follows:

Phage type	*No. of strains*	
	Hospital staff	*Blood donors*
7/42b/47c	8	0
29	0	1
31b	42	1
42b/42c	1	0
42b/47	1	1
42b/47/52	1	0
42b/47c	7	1
47	0	4
Non-typable	4	0
Total of strains	64	8
Total of types	6	5

Here again, as with the strains from patients, there is a predominance of two types among the hospital staff. Type 31b was isolated from 42 nurses (65%), and type 7/42b/47c from 8 (12%). There were 7 carriers of type 42b/47c, which had also been found in 4 of the 47 cross-infected patients. The number of penicillin-resistant strains from the donors is too small to yield much information on phage-type incidence; however, only 1 out of 8 strains belonged to type 31b.

When the distribution of the nasal carriers in the hospital staff was arranged according to wards, it was found that the carriers of penicillin-resistant strains were scattered over the whole hospital, including the operating-theatres. There were carriers of type 31b in all but three wards. Since only a proportion of the staff was swabbed, there were probably carriers of this type in every ward.

None of the 195 strains of *Staph. pyogenes* isolated was more resistant to streptomycin than the Oxford strain of staphylococcus. No nasal carrier of β-hæmolytic streptococci was found in the 400 people swabbed.

DISCUSSION

Examination by the phage-typing method of penicillin-resistant strains of *Staph. pyogenes* isolated from infections of patients in a general hospital and from nasal carriers in the nursing staff of the hospital and in a sample of the general population has yielded results which throw some further light on the ecology of these organisms.

In 196 patients only 12 cases were found in which the clinical condition could be certainly ascribed to a primary infection with penicillin-resistant staphylococci and in which the patient had received no previous penicillin therapy. Since 4 of these infections occurred in members of the hospital staff, there were only 8 cases in which infection occurred outside the hospital community. This incidence of infection with penicillin-resistant strains accords well with the nasal carrier-rate of 4% found in the blood donors examined.

In the present series there were cases in which penicillin sensitivity was converted or may have been converted to resistance as a result of penicillin therapy. However, most of the patients yielding penicillin-resistant strains acquired these strains by cross-infection while in hospital. There were 44 cases of infection of clean surgical wounds with penicillin-resistant staphylococci, compared with 12 cases of wound infection with penicillin-sensitive strains.

The very close agreement between the distribution of phage types among the penicillin-resistant strains from the patients' lesions and from the noses of the nursing staff is particularly striking. It lends further support to the theory that the nasal mucosa of members of a hospital community acts as a reservoir from which staphylococci are distributed, directly or indirectly, to new entrants into the community, whether they be patients or staff. In this hospital there is a preponderance of penicillin-resistant strains in the noses of the staff, and this is reflected in the large number of wound infections with these strains.

The large numbers of carriers of one particular type (31b) provide an interesting problem. Presumably, when the nurses first enter the hospital their nasal staphylococcal flora is similar to that of the general community; yet it was found that after a period of residence in the hospital 42 of 200 were carrying type 31b compared with 1 in 200 of the blood donors. It therefore seems that this particular strain can take the place of other staphylococci in the nasal mucosa. Whether this is due to some intrinsic characteristics of the strain which give it an advantage over other strains in competition for biological space, or whether this is a reflection of the fact that there are greater opportunities to acquire the strain from an environment in which it is the predominant staphylococcus, is not yet known.

The streptomycin-sensitivity tests showed no streptomycin-resistant strains among the 195 strains isolated from nasal carriers. Of the 12 streptomycin-resistant strains isolated from patients, 11 came from lesions which had been treated with streptomycin and in which the strains had previously been sensitive. The 12th strain appeared towards the end of the survey as a cross-infecting organism in a clean surgical wound in a patient who had received no streptomycin. It belonged to phage type 31b and was also penicillin-resistant. Its appearance in the hospital is disquieting.

It is concluded that there is not at present a high proportion of penicillin-resistant staphylococci in the general population of Sydney. However, in a hospital community where there has been opportunity for the selection and dissemination of resistant strains, a reservoir of such strains exists among staff and patients and constitutes the source of infection of new entrants into this community.

SUMMARY

Of 228 strains of *Staph. pyogenes* isolated from 196 patients in a general hospital 107 (47%) isolated from 104 patients were penicillin-sensitive, and 121 (53%) from 92 patients were penicillin-resistant; 31 (84·5%) were streptomycin-sensitive, and 12 (5 streptomycin-resistant.

Phage typing of the strains showed that dominant phage types occurred among the sensitive strains, but among the penicillin strains 75% belonged to five phage types, with predominating.

Analysis of case-records of patients yielding p resistant staphylococci showed only 8 cases of staphylococcal infection in which infection occ certainty outside the hospital community; 8 were considered to have been cross-infected hospital. In 4 cases conversion to penicillin r occurred while in hospital. Most of the cases o infection were those of clean surgical wounds, evidence indicates that they were infected with already penicillin-resistant *at the time of entry* wound.

Surveys of the nasal carrier-rate of penicillin *Staph. pyogenes* in 200 members of the hosp and in an unselected group of 200 blood a carrier-rate of 32% in the hospital staff c with 4% in the blood donors. A close was found between the distribution of phag present in the noses of the staff and in the l patients cross-infected in hospital.

We are indebted to Mr. G. Barr and Miss V. Sfe technical assistance, and to Mr. R. G. H. Barbour typing some of the strains.

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FLAXEDIL AS A CURARISING AGE ANÆSTHESIA

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SOME nine months ago the attention of one of us (was drawn to the work of Bovet et al. (1947) and Oostende (1947), and more recently to that o et al. (1949), on tri-(diethylamino-ethoxy) triethiodide ('Flaxedil'), and it was decided t purely clinical investigation of this drug in man its value as a curarising agent.

The pharmacology of flaxedil has been investigated by the above workers, and it h established that it acts at the myoneural jun interfering with the chemical mediator and thus its action in a way very similar to that of *d*-tub chloride; and, as in the case of that agent, i are easily and rapidly reversed by the anti-cholin eserine and neostigmine. It is also suggested t less liable to facilitate the release of histamin have less effect on autonomic ganglia. Chemic miscible with soluble thiopentone, a debatable ad

METHOD

We decided to standardise our anæsthetic t as far as possible, and we used as prem and scopolamine or omnopon and atropine ording to body-weight, followed by soluble and nitrous oxide and oxygen. always trying anæsthesia in either deep 1st or light 2nd at a level where well-marked tone of the nusculature would still be present. In ntubated all the patients with an oral Magill ted with a 'Nupercaine' paste to allow of erated at this light plane of anæsthesia.

dose of flaxedil just as the surgeon reached um, and additional doses when required, to give the last dose at least 30 minutes nd of the operation, because otherwise the ld have an inefficient peripheral respiratory and therefore be unsafe to send back to toperative ward care. In such circumstances ave given neostigmine and atropine; but 1949) and Clutton-Brock (1949) suggest that f these drugs is not without its dangers and oided as a routine.

our dosage was too low, having been based res of the French workers, who were using n normal adult weighing 10 st. On investigaared that the French surgeons were satisfied e of relaxation which in this country would be inadequate, and the anæsthetic used was lane of anæsthesia much deeper than we were ier itself has a curare-like action; thus the axedil 40 mg. used by the French workers considerably reinforced by ether.

0 patients 60 were children and 20 adults. about 12 adults, underwent laparotomy, most ainder undergoing intrathoracic procedures, eumonectomy and lobectomy; 1 underwent perineal excision of the rectum. All the cases led on the standard Nosworthy charts, and had we any cause for anxiety either during or postoperatively, except for 2 children early es who developed a lobar collapse, which in f further experience we feel might have been late exhibition of flaxedil and return to the some intercostal paralysis still present. No o was returned to the ward with full return tal activity developed any chest complication, gures are too small for this to be statistically .

RESULTS

lings were as follows:

xedil 120 mg. gave comparable clinical effects btained with *d*-tubocurarine chloride 15 mg.

axation began 60–90 seconds after intravenous of flaxedil, reached its peak in 120 seconds, for 20–25 minutes, and wore off gradually.

ase was satisfactory abdominal relaxation without some intercostal paralysis. Good was achieved with some diaphragmatic till present.

re was no fall in blood-pressure; on the during surgical stimulus it often rose, conhe light plane of anæsthesia.

ere was no clinical evidence of excessive release ine, if a frequently occurring pallor could be d to the light anæsthesia.

e gut appeared normal during operation—there ollapse and no distension.

venous thromboses were noted.

abnormal constituents were found in the urine.

stoperative sickness was minimal, but sedation ired earlier because of the rapid recovery from plane of anæsthesia.

CONCLUSION

xedil we have a synthetic curarising agent seems to be devoid of undesirable side-actions. Its effects can be easily and rapidly reversed by neostigmine. It can be used in long operations; we have given 400 mg. in a long difficult thoracotomy without ill effect.

A word of warning is essential. As with all agents which cause peripheral respiratory paralysis of any degree, the anæsthetist must be skilled in the care of the apnœic patient. There is no doubt that flaxedil warrants further trial and, if it fulfils its early promise, may well find a permanent place in anæsthetic practice.

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HYALURONIDASE IN PÆDIATRIC THERAPY

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FOLLOWING the reports of Hechter et al. (1947) and Schwartzman et al. (1948) on the potential therapeutic value in pædiatrics of solutions of hyaluronidase, we have used the enzyme, together with subcutaneous infusions of saline and glucose or plasma and glucose. in 39 infants with varying degrees of dehydration.

Our results amply confirm that this is a harmless procedure which greatly enhances both the amount of fluid that can be injected and the rate at which it is absorbed. Its value in the rehydration of infants with gastro-enteritis, in allowing almost immediate operation in infants with pyloric stenosis who are dehydrated, in the treatment of such conditions as severe inanition fever in the newborn, and in increasing the protein and fluid intake in premature babies is undeniable. In addition, the absorption of even large quantities of subcutaneous fluid is comparatively painless because of the lowered tension resulting from the hyaluronidase.

METHOD OF PREPARATION

Our source of hyaluronidase was bovine semen. This was diluted with an equal quantity of distilled water, frozen for twenty-four hours, then thawed and centrifuged. The supernatant fluid was seitz-filtered and freeze-dried. This method allows maximal enzyme extraction and ensures stability for a long time (Swyer 1947).

The hyaluronidase was put up in 1 mg. doses in sealed ampoules of 1·5 ml. volume. Immediately before use an ampoule was opened and 1 ml. of distilled water added to the powdered freeze-dried hyaluronidase in the bottom of the ampoule, solution being instantaneous. The contents of one ampoule were used for each case. We feel that because of the possible loss of potency when the enzyme has been stored in solution, the use of freshly dissolved hyaluronidase is an important factor and contributed greatly to the satisfactory results we obtained.

METHODS OF TESTING

Before being used clinically the preparation was tested for "spreading" activity, allergic effects, and toxicity.

The "spreading" factor was tested by intradermal injection of decreasing doses into the depilated skin of guineapigs. The bleb produced by 0·02 mg. of hyaluronidase in 0·2 ml. of saline solution completely disappeared in less than two minutes, while 0·001 mg. was absorbed in less than ten minutes. The volume of saline solution which could be absorbed, together with the rate of absorption, was investigated in rabbits, varying amounts of hyaluronidase being used to obtain a standard for clinical work. It was then decided to use 1 mg. as this standard in our clinical trials.

To exclude the possibility of the development of hypersensitivity, six guineapigs were injected subcutaneously with 0·01 mg. in 0·2 ml. of saline solution. Fourteen days later 2 mg. in 0·5 ml. of saline solution was injected intravenously into each guineapig. No reactions occurred, either immediately or within the following fourteen days, in any of the animals. Tests for toxicity were made with intravenous injections into mice and guineapigs and showed that doses equivalent to 250 mg. per kg. of body-weight in mice and 20 mg. per kg. in guineapigs produced no toxic manifestations.

METHODS OF ADMINISTRATION

Schwartzman et al. injected the hyaluronidase first and followed this with saline solution—i.e., the needle containing saline solution was inserted into the middle of an area infiltrated with hyaluronidase. On occasions a saline drip was continued for as long as five days. The outer aspect of the thigh was the site used.

After trying this method (both with subcutaneously and intradermally injected hyaluronidase), and also trying adding the hyaluronidase first to the total solution to be given, our best results were finally obtained when the hyaluronidase (1 mg. freshly dissolved in 1 ml. of distilled water) was injected through the rubber tubing about an inch from the needle as soon as the flow of fluid began. An ordinary two-way subcutaneous infusion set was used and the fluid run in by gravity in every case except in one premature infant for whom speed was essential and the fluid was injected from a 20 ml. syringe. Ordinary-gauge hypodermic needles were used, and the bottle containing the solution was raised to about 3 feet above the level of the cot mattress.

Because it is important that a sick infant should be disturbed as little as possible and prolonged exposure is therefore to be avoided, all injections were made without moving the infants from their cots and at the quickest possible speed, the average time taken (excluding the initial cases, when various methods were being tried) was thirty minutes for an average of 200 ml. of fluid (half-normal saline solution and 5% dextrose).

The ideal site for subcutaneous infusions in an infant is the anterior abdominal wall. One needle is inserted on each side of, and about 1 inch from, the umbilicus and directed laterally. Absorption is maximal and most rapid at this site, the area is clean and away from napkin contamination more than when the thigh is used, and minimal disturbance of the infant is required. It also seems to cause the least discomfort to the infant.

When we started this investigation "control" trials were made. The fluid was allowed to run in on each side till two weals, each containing about 10 ml., were raised. One tube was then clipped and hyaluronidase injected into the other. Two striking things were repeatedly noticed: firstly, the rate of flow, as seen in the dropper, continued as fast as if both sides were being used, and, secondly, the infants rapidly stopped crying. Another interesting observation was that, on removing the needle from the side which had hyaluronidase injected, no collodion was necessary to stop leakage through the needle pucture—there was no leakage.

During the injections the infants could usually be kept quiet by being given a sweetened teat to suck (or a milk feed if the general condition allowed).

One problem which arose was whether abdominal wall, the site of election, could infants in whom abdominal operation wa within a matter of hours, and whether, if it would be any risk of hæmorrhage or of inf found that it was safe to inject at this site hours before a Rammstedt's operation was that there was no abnormal hæmorrhage, sepsis followed. In one case, where mild p present on the anterior abdominal wall, the given into the thigh. However, in view of of Sannella (1940) that hyaluronidase did an experimentally induced infection with *aureus* in rabbits and the explanation of (1947) that hyaluronidase diffuses round and a fibrin barrier—i.e., takes the line of least the abdominal wall might have been used

In the hope of providing easily abs plasma infusions were next tried. Dried reconstituted with 5% dextrose and injected Because of the increased viscosity the flow slower; hence larger needles were nece operation were to be completed within th minutes. Absorption similarly was slower comparable rate of absorption, twice the hyaluronidase had to be used—i.e., 1 mg. into The final disappearance of injected plasma delayed, as compared with saline solution for as long as forty-eight hours—and there round the site of injection a wide area of which persisted for a similar length of time. to be quite harmless.

The possibility that whole blood might when given subcutaneously is worthy of Schwartzman (1949) used it in 3 cases and absorption of 100 ml. in three hours at a drops a minute. This would seem to be of only in those infants in whom no veins are the usual intravenous technique and in down on the vein would otherwise have to

Extension of the technique to include administered drugs which are in large volume —e.g., serum in measles prophylaxis whe globulin is not available, and chemothe high blood levels are indicated and oral is precluded by vomiting. Pain will diminished and absorption ensured.

The time taken to run in the 200–250 ml. which was the average volume used, was fair and varied only with the calibre of the needle height of the fluid. It did not vary with the dehydration, but the time of absorption was shorter in the more dehydrated infants.

Repeated infusions may be given as have found it advisable to change the site of in such circumstances and to inject fresh each occasion. Undoubtedly the effect wears for, though absorption will still be better than any hyaluronidase when a second infusion is same area some hours after the first there is a able falling off in the volume which can be in the rate of absorption.

RESULTS

Clinical results are comparable with those intravenous injections of saline solution, though ment is not so rapid. Rehydration can effected adequately and circulation successfully in collapsed dehydrated infants.

So far our experience, since first using hya in January last, has been limited to 10 cases stenosis, 23 of gastro-enteritis, 3 of prematur influenzal meningitis, 1 of duodenal stenosis; imperforate anus.

ıfants with pyloric stenosis and 2 of the 3 nfants did well, as did the 1 with meningitis e necessity for gavage was obviated by the The newborn infant with duodenal stenosis ed, and his progress was undoubtedly helped ıluronidase. He received infusions of both saline solution : 150 ml. of plasma with 5% s absorbed in four or five hours, and a subsetion of 200 ml. of saline solution and dextrose bsorbed in two and a half hours. After he infant with the imperforate anus received hour 270 ml. which was absorbed in three the 23 gastro-enteritis infants 5 died. evealed *no evidence of any ill effects which* cribed to hyaluronidase, and in 1 case all the uid which had been given only twelve hours h was found to have been absorbed.

es two or more separate infusions were given, s into the original site six hours after the first nd without any further hyaluronidase. The ıts were given their second injection into the ne infant with severe gastro-enteritis had four two of saline solution and two of plasma, and ood recovery.

nabled to ensure the absorption of 60 ml. of tion or of plasma and glucose in a premature ghing $2^1/_2$ lb. with minimal disturbance of the a great advantage, and, since hyaluronidase be completely non-toxic, it is certainly worth ed trial.

e have been using hyaluronidase, preoperative us therapy in dehydrated infants with pyloric as been practically abandoned, and the number nous injections in infants with gastro-enteritis considerably reduced.

bviously desirable that a standard preparation onidase should be established in terms of which cy of different preparations may be assessed accurg., by the method of Swyer and Emmens (1947).

cere thanks are due to Dr. Swyer for providing the dase.

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FFECT OF CARONAMIDE ON TION OF *p*-AMINOSALICYLIC ACID

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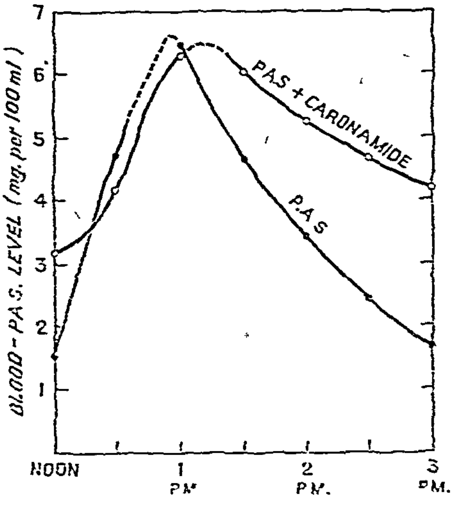
GH *p*-aminosalicylic acid (P.A.S.) was first synby Seidel and Bittner in 1902, it was not until at attention was focused on it as a therapeutic ı tuberculosis. Lehmann (1946), in his search for unds with a bacteriostatic effect on the tubercle , tested in vitro more than fifty derivatives of acid and found P.A.S. the most active. He also its effects in experimentally infected animals and d favourable clinical results in man. Since this l work was published, an increasing number of on the clinical effects of P.A.S. and on its use in nental tuberculosis have been published. These ecently been reviewed by Nagley and Logg (1949).



Effect of caronamide on P.A.S. blood-levels in patient receiving 3 g. P.A.S. 3-hourly from 9 a.m. to 9 p.m.

P.A.S. is a white crystalline powder, and solutions of its sodium salt are obtained by means of sodium bicarbonate, carbonate, or hydroxide. Given by mouth, P.A.S. is rapidly absorbed and rapidly excreted; therefore frequent doses are needed to maintain adequate blood-P.A.S. levels. Typical blood-P.A.S. levels in a patient receiving 15 g. daily in three-hourly divided doses are shown in the accompanying figure. It will be seen that P.A.S. is rapidly absorbed, the blood-P.A.S. level being highest towards the end of the first hour and falling quickly thereafter until at the end of the third hour it has almost disappeared. Lehmann (1946) described a similar type of blood-P.A.S. curve and stated that, when all the blood-P.A.S. levels are followed, the concentration index (ratio of urine-P.A.S. level to blood-P.A.S. level) is about 100 to 1. He added that, for this reason, P.A.S. was probably not reabsorbed in the tubules of the kidney. Alin and Difs (1947) emphasised that there was great individual variation in the rate of absorption and excretion of P.A.S., and that the rate could be influenced by various methods of coating the capsules in which P.A.S. was given.

Way et al. (1948), in their report on the metabolism of P.A.S., to which we had access only at a late stage of our investigation, described a plasma-P.A.S. level similar to ours. Much the highest concentration of P.A.S. is attained in the kidney, the lungs and liver showing the next highest concentrations (Alin and Helander 1948, Way et al. 1948). The binding of P.A.S. by plasma-proteins has already been noted by Way et al. (1948). P.A.S. is absorbed almost completely from the gastro-intestinal tract, and within four hours about 80% of it has been excreted into the urine.

PRESENT INVESTIGATION

The rapidity with which P.A.S. is excreted in the urine made it probable that the renal tubules as well as the glomeruli played a part in the excretory process. For that reason it was considered worth while to compare the plasma-clearance rate with that of a substance which is dealt with purely by glomerular filtration—e.g., inulin—and, if the supposition regarding tubular excretion proved correct, to ascertain whether that part of the process could be inhibited.

'Caronamide' inhibits the tubular excretion of penicillin, diodone, and phenolsulphonephthalein (Beyer 1947). It has been shown further (Beyer et al. 1947) that caronamide has no effect on the glomerular filtration of inulin or on the tubular reabsorption of threshold substances such as glucose. We therefore decided to investigate the action of caronamide in patients receiving P.A.S. for pulmonary tuberculosis. In all cases P.A.S. was given in a daily dose of 15 g. of the sodium salt, 3 g. being given every three hours from 9 A.M. till 9 P.M. Plasma-clearance values, based on the formula $\frac{UV}{P}$, were determined during the hour from 1 to 2 P.M.

TABLE I—EFFECT OF CARONAMIDE ON P.A.S. CLEARANCE AND BLOOD-P.A.S. LEVEL

Case no.	Inulin clearance (ml./min.)	P.A.S. clearance (ml./min.)	P.A.S. clearance after caronamide (ml./min.)	Blood-P.A.S. level at 1.30 A.M. (mg. per 100 ml.)	Blood-P.A.S. level at 1.30 P.M. after caronamide (mg. per 100 ml.)
1	132	185	102	3·5	5·5
2	147·6	181	65	3·6	7·4
3	102	115	46	4·7	7·7
4	125	158	100	3·4	5·3
5	130	194	58	3·4	7·0
6	103	153	58	2·4	5·6
7	144	168	72	4·7	6·0

Caronamide was then given in a dose of 4 g. every four hours. *After twenty-four hours, to allow equilibration,* the clearance of P.A.S. was again determined.

Estimations of P.A.S. in urine and plasma were made by the method of Newhouse and Klyne (1949). Using this method it was found that caronamide alone or in conjunction with P.A.S. had no effect on the intensity of the colour reaction.

RESULTS

The results obtained in seven cases are summarised in *table* I. *It will be seen that* in each case the renal clearance of P.A.S. exceeded the inulin clearance, and was reduced by caronamide to a value much below the figure for inulin. At the same time the blood-P.A.S. level rose. The cumulative effect of caronamide on blood-P.A.S. levels is clearly shown in the figure.

We thought that this somewhat unexpected result might be due to the fact that, as with diodone, a proportion of the P.A.S. in the blood is bound to protein and is *not available for glomerular filtration.* The distribution of P.A.S. in plasma and erythrocytes was therefore studied. From plasma a protein-free filtrate was obtained by ultrafiltration through a 'Cellophane' membrane under a positive pressure of 60 inches of water. We confirmed that there was no loss of P.A.S. from plasma allowed to stand at room temperature for the period of filtration (usually overnight). The results of several experiments, summarised in *table* II, show that about two-thirds of the blood-P.A.S. is in the plasma, and *about a third of that is bound to protein.*

TABLE II—DISTRIBUTION OF P.A.S. IN BLOOD

Case no. ..	3		4		5		6	
P.A.S. (*mg. per 100 ml.*) *in :*								
Whole blood	4·0	8·5	3·7	4·7	3·4	3·7	2·3	3·3
Plasma	5·6	12·6	4·1	5·6	5·1	4·6	3·3	4·4
Erythrocytes	2·6	4·9	3·3	3·75	1·7	2·8	1·3	2·4
Plasma ultra-filtrate ..	3·25	9·4	2·7	3·4	3·2	3·0	2·5	3·2
Packed cell volume (%) ..	53	..	48	..	50	..	53	..
Plasma-P.A.S. bound to protein (%)	42	25	34	39	37	35	24	27
Proportion of blood-P.A.S. present in plasma (%) ..	66	70	58	62	75	62	68	63

If glomerular filtration and tubular excretion were the only two processes by which the kidney deals with circulating P.A.S., it might be expected that caronamide, by inhibiting tubular excretion, would reduce the clearance value of P.A.S. to slightly less than that of inulin. In five of the seven cases, however, the reduction in the P.A.S. clearance was much greater than could be explained on this basis; therefore it is necessary to postulate an additional mechanism. We suggest that the renal tubules, besides excreting P.A.S., *reabsorb it,* the reabsorption not being apparent until excretion is inhibited by caronamide.

Further studies are being made to investigate the effect of giving caronamide in conjunction with P.A.S. for longer periods than was done in these initial experiments.

SUMMARY

p-Aminosalicylic acid given by mouth is rapid and rapidly excreted in the urine, partly by filtration, partly via the tubules.

Tubular excretion can be inhibited by c but the resultant rate of excretion, com inulin-clearance values, is considerably less t be expected from simple glomerular filtration therefore, the renal tubules, besides reabsorb it.

It is possible by giving caronamide in c with P.A.S. to obtain higher blood-P.A.S. levels be obtained by giving P.A.S. alone.

The possible therapeutic application of th is being investigated.

We are grateful to Dr. J. S. Robson and D Ferguson for determining the inulin clearances, t Stewart for much advice and helpful criticism, and Hay for technical assistance.

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EFFECT OF NORADRENALINE ON HUMAN CIRCULATION

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NORADRENALINE—(amino methyl) 3, 4, d benzyl alcohol—differs from adrenaline in l methyl grouping on the amino nitrogen of the The properties of the synthetic *dl* form were first in 1910 by Barger and Dale, who recognised its mimetic action and emphasised its close relationship to adrenaline. Its physiological was probably first postulated by Bacq (19 thought it might be the sympathin E of C Rosenblueth (1933). This possibility was also likely by Greer et al. (1938), but subsequent saw difficulties in accepting noradrenaline as the *thetic mediator,* since in certain respects did not have the known properties of liver (sympathin E).

In 1946 interest was aroused afresh in this su for von Euler (1946) demonstrated the pre *l*-noradrenaline in mammalian tissue, and the of the isomers of the synthetic *substance* by Taint (1948) opened an extensive and widespread inves into its *physiological and pharmacological* imp Holton (1949) has estimated that 50–80% of the substance extracted from pheochrom noradrenaline, and Auerbach and Angell (194 shown that the *U.S.P.* standard adrenaline adrenal *medulla of cattle)* contains *10–18%* of nor line. Goldenberg et al. (1949) have reported agreement with the findings of both these Bulbring and Burn (1949) have demonstrated the cat the pressor substance liberated from the medulla on *splanchnic stimulation* is *a* mi adrenaline and noradrenaline.

Noradrenaline is therefore a substance *of* con physiological interest, and *experiments have* be to demonstrate its action in man by Goldenber (1948) and *independently* by Barcroft and

). I present here observations which corro-
ports of these workers and provide additional
on the effect of noradrenaline on the flow
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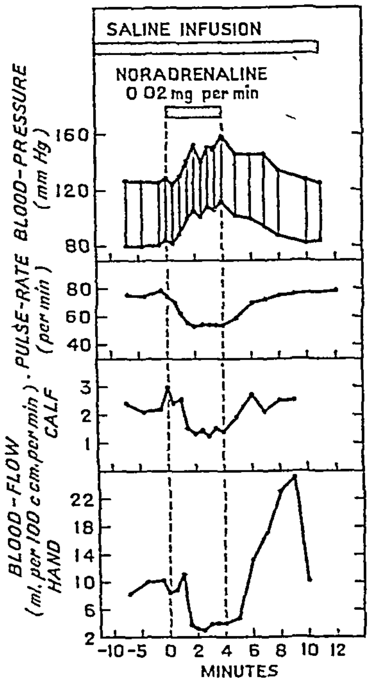

Fig. 1—Mean of six results of intravenous infusion of noradrenaline 0 02 mg. per min. for 4 min. on blood-pressure, pulse-rate, and blood-flow in hand and calf in normal persons.

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ysmograph, and an infusion of saline solution
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r forearm. The blood-pressure was recorded
ual. manner, and the calf blood-flow and
blood-flow were estimated by venous-
lethysmography. When basal levels had been
he solution containing the required dose of
line hydrochloride was administered through
eedle.

a composite graph of certain effects of the
s infusion of 0 02 mg. of *l*-noradrenaline per
4 minutes. It is constructed from values
om eight persons, but each effect is the mean
lts—i.e., in some persons the calf blood-flow
-pressures were recorded but not the hand
, and vice versa. The results for each person
rikingly to the composite pattern as a whole,
s considerable personal variation in the degree
.

BLOOD-PRESSURE

be clearly seen that the effect on the blood-
s to give rise to a hypertension, with both
d diastolic pressure levels well above basal
he bradycardia is also a pronounced feature.
hat in the presence of a bradycardia there is
iastolic pressure suggests an increase in total
resistance, and Goldenberg et al. (1948)
n by an indirect estimation that noradrenaline
h an effect, in contradistinction to adrenaline,
ses a fall in total peripheral resistance. These
ave also shown that noradrenaline usually
fall in cardiac output or sometimes leaves it
l. The pressor effect therefore depends mainly
e in resistance in the peripheral vascular bed.
nge in peripheral resistance is probably not
hroughout the vascular bed, but from fig. 1
seen that the effect on calf blood-flow, which is principally through skeletal muscle, is to diminish the flow. Because the flow varies directly with inflow pressure and indirectly in relation to the resistance of the vascular bed, one can say there is an active vasoconstriction. This phenomenon has been investigated by Barcroft and Konzett (1949b) who though they found little change in forearm flow on intravenous infusion showed that intra-arterial infusions into the femoral artery caused a vasoconstriction in the calf, and concluded that noradrenaline acts directly on the blood-vessels in the muscle.

The effect of infusion of noradrenaline on the flow of blood through the hand, which flow is chiefly through skin, is to produce a definite vasoconstriction, which is maintained during the period of infusion. This vasoconstriction is a local action on the skin vessels, for it occurs when the vasoconstrictor fibres are sectioned, as in persons who have undergone sympathectomy. The constrictor effect on the skin does not seem to be so great as that caused by equal doses of adrenaline—an observation which is reflected in the degree of pallor which the two drugs may produce. However, as with adrenaline, there is a similar dilatation in the hand after the local effects of the substance have worn off.

BRADYCARDIA

An attempt was next made to elucidate the bradycardia resulting from noradrenaline infusions. The effect was probably reflex, since in the isolated mammalian heart noradrenaline causes tachycardia. Goldenberg et al. (1948) mentioned that the bradycardia was abolished by atropine; hence it seems to be a vagal reflex. Fig. 2 shows the effect of the infusion of 0·005 mg. noradrenaline per minute before and after, the intravenous injection of 1·3 mg. of atropine, and fig. 3 shows the effect of the same dose on another person after the intravenous injection of 2 mg. of atropine. Both these persons showed a more pronounced pressor response than usual, for their response to 0 005 mg. was similar to that produced by 0·02 mg. in fig. 1. It will be seen at once that the bradycardia has not been abolished, but it is almost certain that neither person was fully atropinised. In other persons the bradycardia was abolished.

The potentiating effect on the blood-pressure response is remarkable, however, and emphasises the importance of the vagal reflexes in the regulation of blood-pressure. By analogy, very small doses of pressor substances circulating in a person with relatively insensitive vasomotor regulation would produce a much higher blood-pressure than the same amount of substance in a person with a brisk vagal response. Goldenberg et al. (1948) recognised the similarity of the pressor effect of

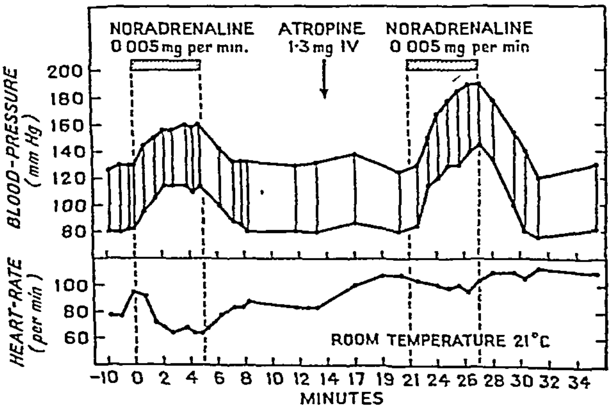

Fig. 2—Blood-pressure and pulse-rate of hypertensive person given noradrenaline 0·005 mg. per min. before and after intravenous atropine 1·3 mg.

noradrenaline to essential hypertension. Perhaps the sensitivity of the vasomotor reflex may also be a factor worthy of interest in hypertensives who have an unusually rapid heart-rate.

SUBJECTIVE SYMPTOMS

Few persons noted disturbing subjective symptoms. If they complained, the common story was of an "uneasy awareness." On questioning, they usually said they felt compelled to breathe more deeply, and sometimes they noted that their heart's action seemed slower and more forceful. Some of the persons in whom a well-marked rise of blood-pressure was produced complained of a transient headache.

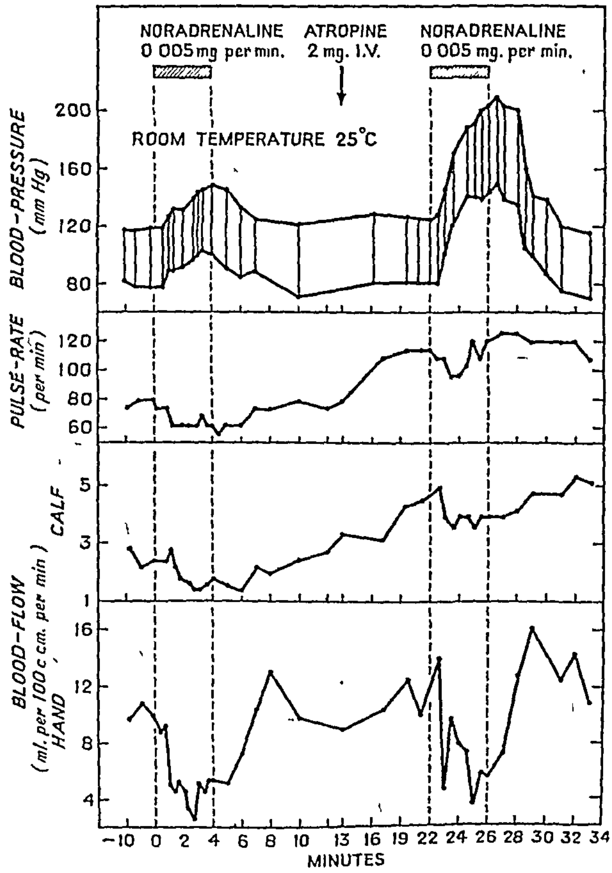

Fig. 3—Blood-pressure, pulse-rate, and blood-flow in hand and calf of another person given noradrenaline 0·005 mg. per min. before and after intravenous atropine 2 mg.

SUMMARY

Noradrenaline, a substance which has been shown to occur in man, has been administered to normal people.

The main effect was a peripheral vasoconstriction, which led to a rise in both systolic and diastolic blood-pressures.

A bradycardia developed which was probably reflex in origin. In the absence of such a bradycardia the effect of noradrenaline was potentiated.

The *l*-noradrenaline hydrochloride was part of the sample made available to Prof. Henry Barcroft by Dr. M. L. Tainter. My grateful thanks are due to the subjects of the experiment. It gives me much pleasure to acknowledge the kindly advice and assistance I received from Professor Barcroft and also from Dr. H. Konzett, who was associated with Professor Barcroft in much of the original work done on the subject in this country. Mr. J. Dalrymple gave efficient technical assistance.

References at foot of next column

FACIAL PALSY AND POLIO

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THE ætiology of the facial palsy of lo neurone type, sometimes known as Bell's obscure. Local chilling has been regarded a tributory factor, and an association with the herpes zoster has occasionally been noted however, no satisfactory explanation is found

Walshe (1947) has drawn attention to the incidence, cases tending to occur in groups in autumn and early spring.

The possibility of an association between facial palsy and poliomyelitis has been previously (Lavergne et al. 1932, Kissel 1938, 1944). Lavergne et al. (1932) were able to find of over 80 cases of isolated facial palsy which attributed to this infection.

In the Mauritius outbreak (Seddon et al. 1946) cases (2·5%) had involvement of the medulla, but of 500 cases (0·6%) had any permanent facial though the period of observation was not long assess the ultimate degree of recovery.

In the London epidemic of 1947 a high proportion with cranial-nerve involvement was noted (Ke of 66 cases, 19 had a cranial-nerve lesion and 5 of facial paralysis.

In the Malta outbreak (Agius et al. 1945) there high incidence of facial paralysis; of 426 cases myelitis, facial paralysis (which was always occurred in 47 (11%), and the important obse made that 29 of these showed no other abnormality months after the epidemic was over 10 cases still paralysis.

Kissel (1938) reported an outbreak in a villa there were 7 cases of facial paralysis, unaccom other paresis in 3 and associated with a 6th ne on the same side as the facial lesion in 4. There the 4 cases of poliomyelitis with ascending paralysis, 3 were fatal; 1 fatal case with bulbar paralysis paralysis; and a final case with an isolated f All the cases occurred within one month.

Wyllie (1944) observed a family in which 2 m facial palsy, 2 had "influenzal symptoms," 1 had a and 1 had clear-cut poliomyelitis with paralysis a He thought that the first case of facial paralysis to poliomyelitis, and resulted in paralytic and disease in the other members of the family.

From these various observations it seems not un able to suppose that some cases of so-called Bell are really due to poliomyelitis. A small series of facial palsy which occurred about the time outbreak of poliomyelitis is recorded here.

PRESENT SERIES

During 1948, 22 cases of poliomyelitis were in Sheffield; in the same year 8 cases of facial palsy of lower motor neurone type of unknown unaccompanied by other paresis attended the patient department of the Children's Hospital,

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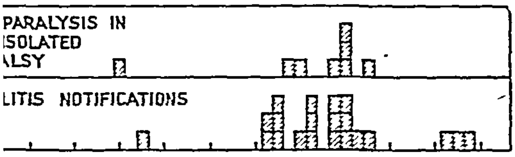
on arises whether there was a relation between oups of cases. The peak of occurrence of the ions appears to coincide (see figure), and it is at the grouping of the cases of facial palsy was

I am indebted to Mr. G. H. Jowett for the tatistical comment :

f isolated facial palsy were uniformly distributed the year, the second moment of the week number currence of 8 cases would have an expected value d a standard error of 71·3. The observed second 43·5 which differs from 197·2 by more than twice fore it may be concluded that the hypothesis of stribution is unacceptable, the dispersion of the too small to be a likely chance finding.

y *the following 5 case-histories illustrate an* gradation between frank poliomyelitis and ial palsy.

Poliomyelitis with initial facial paralysis and later paralysis.—A girl aged 2 years 5 months developed espiratory infection on Sept. 26, 1948 ; during the week she vomited occasionally and had slight Oct. 2 she developed a left facial palsy. Admitted on the 3rd, she was apathetic and drowsy with r (temp. 100·2°F in the axilla). The only neuro-normality found that day was a left facial palsy motor-neurone type. Lumbar puncture next day erebrospinal fluid containing 80 mononuclear cells , with protein 40 mg., chlorides 720 mg., and sugar r 100 ml. On Oct. 5 she developed early paralysis ntercostal muscles. She was transferred to the Hospital and died on Oct. 6.



. *Poliomyelitis with facial paralysis and nystagmus.*—d 1 year 6 months became unwell on Aug. 31, 1948. 3 she developed a right facial palsy. On the 4th ne slightly febrile, the fever persisting until her to hospital on the 7th. The abnormal neurological hen were meningism, nystagmus, and a right facial he cerebrospinal fluid contained 90 mononuclear cmm., with protein 30 mg., chloride 750 mg., and mg. per 100 ml. On Sept. 8 no ocular abnormality d. She developed no further paralysis. The facial still complete 36 weeks later.

. *Facial paralysis and normal cerebrospinal fluid.*—alysis this is considered as a case of facial paralysis

aged 2 years 8 months became slightly unwell on 1948. On Oct. 2 she developed a right facial palsy. her mother noticed that her eyes were "flitting this may have been due to transient nystagmus. seen in the outpatient department on Oct. 4 when neurological abnormality found was the right facial he cerebrospinal fluid contained 7 cells per c.mm.; was less than 10 mg. per 100 ml., with chlorides and sugar 80 mg. Her facial paralysis completely d within 12 weeks.

4. *Facial paralysis with some associated malaise.*—ged 4 years was noticed to be sleepy and tired ; she ed of a little aching behind the right ear ; she was rish. Next day she was found to have a complete cial palsy of lower-motor-neurone type. She was d by an otologist who found no abnormality of the e paralysis was still complete 32 weeks later. The pinal fluid was not examined.

5. *Facial paralysis with no general disturbance.*—ged 5 years was perfectly well, when one morning er noticed that his face was asymmetrical and that difficulty in whistling. He had a right facial palsy which recovered in 11 weeks. The cerebrospinal fluid was not examined.

Of the 8 cases of isolated facial palsy, 6 recovered within 12 weeks. At 32 weeks after the onset, 2 still had paralysis.

The observers in Malta (Agius et al. 1945) attributed their cases of isolated facial palsy to poliomyelitis (1) because of the absence of other causes, (2) because of the presence of the same kind of general disturbance, and (3) because of their occurrence during an epidemic period. The first of these criteria applies to all the cases of isolated facial palsy in the present series, and the last applies to 7 of the 8 cases. Only 4 of the 8 had any associated malaise.

Though there is a suggestion that the cases of facial palsy unaccompanied by other paralysis had a cause in common with the cases of poliomyelitis, this hypothesis is not, of course, proven. The numbers were small : the cases of facial palsy seen in the outpatient department may not have been a true reflection of the incidence ; the notification figures of poliomyelitis, in view of the difficulties in diagnosis, only give an indication of the time of the epidemic ; and the concurrence of the outbreaks was only observed during the one year.

SUMMARY

The simultaneous occurrence of a group of cases of isolated facial palsy and of poliomyelitis is recorded. The possibility that the cases of facial palsy were caused by the virus of poliomyelitis is discussed.

I wish to thank Mr. G. H. Jowett, lecturer in statistics in the University of Sheffield, for the statistical note ; Dr. Llywelyn Roberts, medical officer of health for Sheffield, for the notification figures of poliomyelitis ; and Prof. R. S. Illingworth and Dr. T. Colver for permission to quote their cases.

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CURARE WITH GENERAL ANÆSTHESIA FOR FORCEPS DELIVERY

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CURARE as an adjuvant to general anæsthesia ensures a reduction in the quantity of anæsthetic used and therefore a reduction in toxicity. For this reason, as well as for its relaxant power, it has been used in cæsarean section, 100 cases being reported by Whitacre and Fisher[1] and 30 cases by Gray.[2] There was no evidence of curarisation or medullary depression in the infants.

The present investigation into the use of curare in forceps deliveries was instigated by the following case :

A woman, aged 27, with severe pre-eclamptic toxæmia, was admitted to hospital on April 16, 1948. Labour began spontaneously, and the patient was given bromethol rectally (Dewar and Morris[3] technique) to control her restlessness and toxæmia. The fœtus was thought to be dead, since no heart sounds could be heard. After forty-three hours' labour instrumental delivery under general anæsthesia was decided on and, on the presumption that the fœtus was no longer viable, the case was thought suitable for testing curare.

Anæsthesia was induced with nitrous oxide and oxygen. When the patient became unconscious, 10 mg. of *d*-tubocurarine chloride was given intravenously. Ether was then added to the gases, and it was noted that the patient tolerated a rapid rise in concentration of the anæsthetic mixture, an *observation which was confirmed in subsequent cases treated* with curare. The pelvic floor was well relaxed, and delivery was accomplished without episiotomy. The infant took a first breath after 12 seconds; in 10 minutes it was fully resuscitated and cried.

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[1] Whitacre, R. J., Fisher, A. J. *Anæsthesiology*, 1945, 6, 124.
[2] Gray, T. C. *Brit. med. J.* 1947, i, 444.
[3] Dewar, J. B., Morris, W. I. C. *J. Obstet. Gynæc.* 1947, 54, 417.

After this favourable result in circumstances in which both mother and fœtus were poor risks, an extended trial of curare in forceps cases was instituted.

TECHNIQUE

As premedication, atropine sulphate gr. $^{1}/_{100}$ was given intravenously or intramuscularly to ensure a timely effect. Anæsthesia was induced with nitrous oxide and *oxygen or a small dose of thiopentone (0·25–0·5 g.),* after which the patient was given 10 mg. of *d*-tubocurarine chloride intravenously. The main anæsthetic—cyclopropane, ether, or 'Trilene'—was then administered along with a high concentration of oxygen to prevent hypoxia and medullary depression in the fœtus. Narcosis was maintained at the lightest level until delivery was completed. When a closed-circuit machine was used, the absorption of carbon dioxide was suspended until the cord was tied. Twenty-four mothers, one of whom had twins, were anæsthetised by this technique. Induction was by nitrous oxide in thirteen cases and by thiopentone in eleven.

RESULTS

Anæsthesia

A dose of 10 mg. of *d*-tubocurarine chloride was not exceeded in any of the cases, and it was noted that respiration was never abolished, though its depth was reduced to some slight extent. The size of the abdomen in pregnancy and its restrictive effect on breathing must be borne in mind when giving curare.

The partially curarised patient tolerated a steady quick rise in the concentration of ether.

A smaller amount of general anæsthetic was required; the deep anæsthesia usually requested for relaxation of the pelvic floor was not necessary.

The average *time between induction and delivery* was 17 minutes.

Delivery

Uterine contractions were not affected.

A contraction ring which was present in two cases persisted, and an antispasmodic drug had to be given.

The muscles of the pelvic floor were well relaxed, allowing intravaginal manipulation and making episiotomy a matter of choice rather than necessity.

In the third stage the uterus contracted well, and the placenta was expelled in each case without excessive bleeding or delay.

Infant

Of the 25 infants 16 breathed *immediately,* 7 within 1 minute, and 2 within 2 minutes of delivery. The average time taken by the infant to breathe after delivery was 15 seconds. In the cases induced with thiopentone the average time was 21 seconds, and in those induced with nitrous oxide it was 10 seconds. The average time taken by the infant to cry after delivery was 2 minutes 36 seconds; in the cases induced with thiopentone the average time was 2 minutes 50 seconds, and in those induced with nitrous oxide it was 2 minutes 22 seconds.

CONCLUSION

From these results it seems that, whereas induction with thiopentone shortens the period of unconsciousness of the mother, it lengthens the interval between birth and the start of breathing and crying of the infant. Barbiturates may therefore be inadvisable when prenatal circulatory depression is observed in the fœtus.

The kindly help in this investigation of Prof. J. R. Kellar and his assistants is gratefully acknowledged.

STRANGULATED MESENTERI
OF CÆCUM

J. F. H. BULMAN
F.R.C.S.

MESENTERIC hernia has been fully revi
past ten years: Dolton[1] reviewed 76 ca
Scott[2] reviewed 50 cases; and Hansma
examining the published reports of inter
types, found 38 mesenteric cases, compr
total.

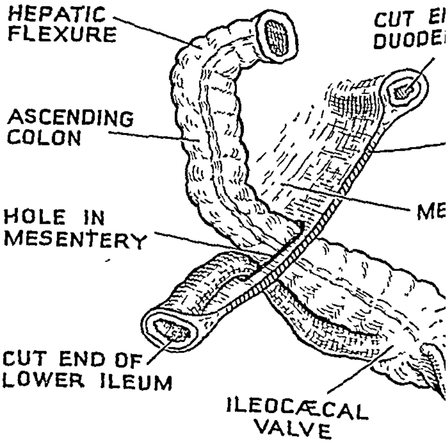
In a brief study of the published case
one in which the cæcum, the lower half
colon, and a corresponding piece of term
all passed through a hole in the base o
as in the following case.

A thin woman, aged 85, was admitte
Hospital with two days' severe generalised
and distension. She had felt well until two
when she developed abdominal pain and
pains and distension gradually increased, an
to eat anything or to drink more than s
fluids. She felt sick and vomited a small
fluid on one occasion. The pains were inte
and felt all over the abdomen. She had no
constipated and she had a small motion o
admission. On the morning of the day
enema produced only coloured fluid.

Previous History.—For about ten years
pain in the right side of the abdomen whe
she had put down to her ribs sticking i
Two years ago she had had an attack of seve
and flatulence, which had been relieved wi
had three children, and had had toxæmia
the third; otherwise she had had no ser
had never had an operation.

On admission the patient's temperature
rate 92, and respirations 20 per min. Her
and only slightly furred. Her abdomen was
all over, the greatest distension being in t
No mass was felt. The abdomen was tym
percussion; active bowel sounds were hear
but there was no visible peristalsis. R
revealed nothing abnormal; nor was an
found in the heart, chest, or urine. A pro
of obstruction due to carcinoma of the pelvi

Operation (an hour after admission).—U
gas, oxygen, and ether (Dr. J. K. Hope Sc
right rectus split incision was made with a
transverse colostomy. The transverse col
found to be completely collapsed. The inci
enlarged into an 8-in. right paramedian.
bowel, almost the size of a rugby football,
from the left iliac fossa and found to be the



Mesenteric hernia of cæcum.

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1. Dolton, E. G. *Brit. J. Surg.* 1943, 31, 275.
2. Cutler, G. D., Scott, H. W. jun. *Surg. Gynec.*
3. Hansmann, G. H., Morton, S. A. *Arch. Sur*

ıscending colon, with a normal appendix hanging ctremity. The terminal ileum was also much The bowel wall, though thin, was not gangrenous. ›e with rubber tube attached was inserted through ılong one of the tænia of the cæcum and secured atgut purse-string sutures. The gas and fluid emoved aseptically from the cæcum. When this ıne, it was found that the cæcum, with the lower scending colon and the terminal ileum, had passed ɔle in the lower end of the mesentery of the ileum. ed bowel was pulled up through this hole without ılty, together with the Paul's tube and rubber end of which had been clamped and covered with he abdomen was then closed, with the Paul's ding from the lower end of the incision, and the cal wall was sutured to the parietal peritoneum.

ive Course.—The patient made a good recovery. 00,000 units and sulphadimidine 1 g. were given ı four-hourly for 8 doses. The patient did not took fluids by mouth on the first day. The drained well, and the bowels were opened twice ı the third day and then not until the seventh an enema. The Paul's tube became loose and d on the eighth day, and the sutures were removed. l day the bladder was found to be greatly distended ıtient to have overflow incontinence of urine. vas tried without success, and a catheter had to aily until the 26th postoperative day.

f Cæcostomy.—Seven weeks after the operation the still remained patent and was a nuisance to the ›ugh very little fæcal matter came out of it. A ation was therefore performed for extraperitoneal ıe cæcostomy. The wound healed by first intention atient was discharged home ambulant in the

SENILE HÆMATOCOLPOS

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ctors are necessary for the formation of a lpos—complete obstruction in the lower part ital canal, and bleeding from some point above ıction. The usual type of hæmatocolpos met ıe to imperfect canalisation of the lower end llerian ducts (usually a so-called imperforate ıd menstruation. The hæmatocolpos described ttributable to trophic (senile) adhesive vaginitis ng from an endometrium stimulated by œstro- apy. No similar case appears to have been

CASE-RECORD

ed woman, aged 68, was admitted to this hospital , 1949, complaining of lower abdominal pain for and vomiting and difficulty in starting micturition s.

History—She had borne four children. Since her at the age of 45 there had been no vaginal bleeding. 10, 1948, she had consulted her doctor because of n the region of her vulva and stress incontinence Local treatment with 'Menopax' ointment and tion of dienœstrol 1 mg. by mouth daily was nd it continued until admission to hospital— ır months. When she was seen as a private patient W. Nankivell, gynæcological consultant, on Oct. 26, pruritus had considerably improved, the cervix atrophic, and operative repair of a cystocele and vas advised.

ıission.—Abdominal palpation revealed a tense elling, situated symmetrically in the abdomen, of the pelvis, and extending upwards to almost etween the symphysis pubis and the umbilicus. ghtly tender and dull on percussion and resembled dder, but after insertion of a urethral catheter it unchanged and only 1 oz. of urine was voided. al examination a cystocele and a rectocele, each as a duck's egg, were found. The vagina ended out 2 in. above the introitus. The lower pole of the cystic swelling was felt by the examining finger, but appeared to be separated from its tip by tough tissue about $^1/_2$ in. thick. Examination with a speculum showed atrophic and stippled vaginal lining characteristic of colpitis senilis. About 2 in. from the introitus the anterior and posterior vaginal walls appeared to be glued together.

Operation (Jan. 15, 1949).—Under intravenous thiopentone anæsthesia, supplemented with nitrous oxide, oxygen-ether inhalation, an Auvard speculum was inserted into the vagina, whose anterior and posterior walls were separated from each other, first with a probe and then with the finger, which soon penetrated into a large cavity, representing the greatly distended upper part of the vagina. The adhesion between the anterior and posterior vaginal walls was quite firm and required some pressure to break it down. The cavity so entered contained about 300 ml. of tarry fluid blood, which escaped under tension. It was now possible to inspect the cervix uteri. This was flat and atrophic and showed no sign of a growth. Bimanual examination revealed that the cystic swelling had disappeared and that the uterus was small and freely movable. The uterine appendages were not palpable. The speculum was reinserted, and a cuff-like oozing area $^1/_2$ in. wide was seen to encircle the vaginal wall, corresponding to the adhesion which had been broken down. To exclude carcinoma of the body of the uterus and to obtain some mucosa for histological examination, a diagnostic curettage was done after dilatation of the cervical canal to Hegar 7. However, no mucosa was obtained with the curette. The length of the uterine cavity was 6 cm. The vagina was lightly packed with gauze.

Postoperative Course.—The vaginal pack was removed after twenty-four hours. Discharge of some stale fluid blood continued for four days, and the patient left hospital on Jan. 20, five days after evacuation of the hæmatocolpos.

Follow-up.—The patient was seen again on Jan. 26, when she felt perfectly well and there was no vaginal discharge. There was some evidence of colpitis senilis, but the cuff-like eroded area described above was covered with epithelium. The upper third of the vagina, which had only recently been found greatly distended, had shrunk to the width of the lower two-thirds. The cervix was easily accessible, flat, and atrophic. The uterus was small.

On Feb. 10 the findings were unchanged. The patient was advised not to take any tablets, and to report to her doctor at four-week intervals.

DISCUSSION

Source of Blood

A bleeding growth of either the cervix or the body of the uterus was excluded by inspection and curettage respectively, and there was no evidence of a feminising mesenchymoma (e.g., granulosa-cell tumour) of the ovary. There can thus be little doubt that the blood of this hæmatocolpos originated from the endometrium stimulated by the œstrogen which had been administered. The patient received dienœstrol 1 mg. by mouth daily for four months, as well as an unspecified amount of stilbœstrol by inunction (1 g. of the ointment used contains 1 mg. of stilbœstrol).

The relative potency of dienœstrol has recently been the subject of investigations. According to Barnes (1942), dienœstrol is ten times more effective than stilbœstrol in suppressing lactation, and Emmens (1938) states that it is four times as active as stilbœstrol if given by mouth to mice. On the other hand, Kemp and Pedersen-Bjergaard (1943), Bishop et al. (1948), and Harmer and Broom (1948) assess the relative potency of dienœstrol at a half, a quarter, and two-thirds of that of stilbœstrol respectively.

Continuous administration of œstrogens to a woman with amenorrhœa is liable to produce endometrial hæmorrhage, which, in Bishop's (1947) nomenclature, is termed "threshold bleeding."

Apart from alarm and anxiety, if the patient has not been warned of the possibility of a hæmorrhage, little harm is usually done by the bleeding, and, in our present state of knowledge, the danger of carcinogenic action of œstrogens is remote. However, the present case shows that a pathological condition may be produced by uninterrupted and uncontrolled administration of œstrogens. "It is in the treatment of the menopause that overdosage is so often practised" (Bishop 1947).

Obstruction

The formation of vaginal adhesions in the course of colpitis senilis is not rare. Opposing areas of the vaginal wall, denuded of epithelium and inflamed, become adherent to one another, bands are formed, and in extreme cases the cervix is completely shut off from below.

Adhesions may develop at any level but more often affect the junction of the upper and middle thirds of the vagina, where they were present in this patient. At this level, too, pericolpitic fibrosis and shrinkage may develop, constituting Labhardt's (1924) Kraurosis fornicis vaginæ, though on rare occasions similar changes have been found lower down, constituting Halban's (1937) cirrhosis annularis subhymenalis. It has been a matter of dispute why adhesions and fibrosis should more often develop at the junction of the upper and middle thirds of the vagina. It is at this level that the margins of the levator ani cross the vagina, and the contractions of this muscle are said to cause constant irritation. Again, this level is regarded by some embryologists as the developmental border between müllerian ducts and urogenital sinus (Zuckerman 1940). The most acceptable explanation, however, is that at this level the vaginal arteries anastomose with the descending branches of the uterine arteries. These anastomoses, though sufficient to maintain an ample blood-supply during youth and adult life, may fail in old age owing to changes in the vessel walls, which in turn are the result of ovarian underfunction (Novak 1937, Labhardt 1924, 1936). This failure of anastomosis is responsible for trophic changes in the area supplied, such as superficial ulceration and fibrosis.

The adhesions in this case formed quickly. When the patient was seen on Oct. 26, 1948, the cervix uteri was accessible, but on Jan. 14—i.e., eleven weeks later—a relatively firm and extensive adhesion had developed. This must have preceded the hæmorrhage from the endometrium, since the patient had never noted any escape of blood. The $^1/_2$ pint of blood must have taken a few weeks to accumulate, which leaves only a very few weeks for the development of the adhesion. This is hard to explain unless one ascribes the rapid formation and consolidation of the adhesion to the action of the administered œstrogens. There is no mention of this in the literature but I venture to suggest that œstrogens, which are "growth-hormones with a special action on tissues of müllerian origin" (Novak 1947) may accelerate the formation of granulation tissue in the vagina, once opposing areas of its wall have become glued together.

Symptoms

Hypogastric pain and dysuria are consistent with the development of a hæmatocolpos which leads to painful distension of the affected part of the vagina and distortion of the base of the bladder and possibly the urethra. Whether the vomiting was "reflex" or due to toxic action of the œstrogens is a moot point. Dienœstrol is said to be less liable than stilbœstrol to cause nausea and vomiting.

My thanks are due to Mr. C. Heygate Vernon, senior gynæcologist, for permission to publish this case, and to Mr. J. W. Nankivell and Dr. D. Hacking for giving me access to their private clinical notes.

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ACUTE ARTERIAL SPASM COMPLI
ACCIDENTAL HÆMORRHAGE IN
PREGNANCY

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TRAUMATIC arterial spasm is a recognis
entity; Cohen (1944) dealt exhaustively
subject in a Hunterian lecture. It is well k
such spasm may follow not only direct
irritation of the artery but also severe h
John Hunter (1837) demonstrated in animals
narrowing of the major vessels on bleeding, an
Jones (1943) comments: "This is a protecti
nism against complete exsanguination after
arterial wounds." Bywaters (1942) and Be
also drew attention to local vascular spas
numbness and disappearance of the pulse in
patients with generalised shock following
injuries; at subsequent necropsy they ob
absence of damage to the artery of the limb.
and Breckenridge (1945) reported traumat
spasm following a severe accident withou
injury to the blood-vessels as shown at oper

It should therefore come as no surprise t
a pathological arterial state in obstetric
characterised by severe accidental hæm
retroplacental bleeding. A full search of the
and obstetric journals, however, has not re
reports of this condition.

In the following case, operation confirmed t
of such spasm; indeed, since then, inter
patients who have had such obstetric c
indicates that local vascular spasm may be mo
than published reports indicate.

Severe accidental hæmorrhage is so dra
attended by such severe general symptoms
not to be wondered that complaints of
or limb-coldness may be overlooked and t
lesion pass unsuspected. In the case report
the general picture of the original obstetric
was superimposed a sudden and urgent vascu
tion affecting the arteries of the right lower li

CASE-RECORD

A multipara (six deliveries, all normal), ag
admitted on Aug. 8, 1945, at 5.30 A.M., with sever
abdominal pain, radiating to the back, which h
suddenly a few hours previously. There had bee
when the pain started, but there was no bleeding o
She was 34 weeks' pregnant according to the dat
menstrual period. The pregnancy had been
and no abnormality had been noted at her regular
antenatal clinic.

On Admission.—She was pale, restless, and in o
her pulse-rate was 120, regular, and the bl
110/75. The urine contained a fair amount
The uterus was board-hard and tender, and the
felt 3 finger-breadths below the xiphisternum.
parts were felt, nor was the fœtal heart heard.
accidental hæmorrhage was diagnosed.

A few minutes after the examination the patient
of sudden excruciating pain in the right thigh a
shouted "My leg, my leg," describing numbness an
needles. This leg pain was her dominating t
eclipsed her abdominal discomfort. The skin of t
below the knee, was pale, with several cyanotic
the dorsum of the foot. On palpation the affect
appreciably colder, with no pulsation in either
pedis, the popliteal, or the femoral arteries. Th
firmed by several observers. The limb was an
to the level of the lower border of the patella;
complete motor palsy, and passive movements we
painful. The pulses in the opposite limb were reac

no complaints about that limb. Embolism of the non iliac artery was provisionally diagnosed. nfirmed by Mr. J. Spalding. While preparations made for a blood-transfusion and operation, sudden vaginal loss of 1 pint of blood, and the ndition became even graver. Some three hours ision the condition of the limb had remained despite morphine and blood-transfusion.

(Mr. Spalding).—At 8.30 A.M., under general the abdomen was opened through a midline he uterine surface was found to be covered with noses as originally described by Couvelaire (1912). hysterectomy, with the fœtus in situ, was done. ssels were next exposed and explored. The right ac artery was pulsating and of normal size, but l and external iliac arteries were in spasm and The right femoral artery was exposed through a l incision in the inguinal region and found to be y spasm. Right lumbar sympathectomy was next a slow return of pulsation was soon observed. en was closed in layers.

tive Progress.—The patient's general condition ery poor for several hours after the operation, and pressure dropped to 82/60. The beneficial effects od-transfusion, the general treatment for shock, cal treatment (elevation and cooling of the limb) ne apparent, and pulsation returned in the dorsalis y. Next day she seemed much better; her colour and there was strong pulsation in the arteries of the . Convalescence was slow: but she was discharged tory general condition some two months after

p.—Recently the patient was seen again and was in neral health. The right lower limb had recovered , except for a small patch of anæsthesia on the of the right thigh.

DISCUSSION

shock seems obviously to have been responsible evere arterial spasm; operation excluded the r possible cause, embolism. I have not observed ere arterial spasm in patients shocked from age due to placenta prævia or the ordinary um hæmorrhage, but in accidental hæmorrhage k is much more profound. In accidental hæmor- addition to the blood-loss, the possibility of " factor responsible for the local uteroplacental and generalised vascular liability to spasm considered.

ct that only the right iliac vessels were affected planation. I suggest that this may be explained he increased vessel irritability in shock (every is aware that the lightest handling of a vessel e patient is in shock, will send the vessel into and (2) the right uterine obliquity and the erance of the intramyometrial bleeding on the e, which may have led to an increased pressure right iliac artery in this case. Such pressure nds to the surgeon's manipulation.

of interest to note that the spasm affected the ernal and external iliac arteries but not the right iliac. Mr. S. M. Cohen has suggested (personal ication) that this was probably due to the fact e common iliac artery contains relatively little tissue.

e present case a sudden onset of arterial spasm ed a picture identical with that of embolism. Learmonth (1948) has described two cases "in ll the features of embolism are present except bolus." But his cases were cardiac, and the n of shock did not arise.

agonal vasoconstriction may be responsible for nxiety on the part of the obstetrician, who will consider the advisability of an additional major on to save the limb of a patient already gravely accidental hæmorrhage. Since seeing the above have made specific inquiries, and I can report , though less severe symptoms on three occasions. Minor degrees of spasm should subside on conservative treatment. The treatment of the major cases still presents a problem. Sympathectomy will not always relieve such spasms (Cohen 1944), and measures such as high spinal anæsthetic are better avoided in such states of shock. Adequate resuscitation is clearly the key to success, and experience of the traumatic cases indicates that such spasm is likely to yield to it. If a surgeon accustomed to sympathectomy is available, it is a measure that could well be carried out at the same time as any other abdominal operation; it adds little to the operating time or to the shock and is unlikely to do harm. As with embolectomies, there is no need to operate hurriedly on the limb (Learmonth 1948), for delay up to ten hours is permissible.

SUMMARY

A case of acute arterial spasm associated with accidental hæmorrhage in late pregnancy is described.

The right lower limb was completely paretic and anæsthetic, and the patient in agony.

Two factors are held responsible: (1) increased vessel irritability in shock; and (2) obliquity of the uterus and increased hæmorrhage in the right wall of the uterus.

Sympathectomy appeared to relieve the spasm, but it was accompanied by full resuscitative measures, including blood-transfusion.

My thanks are due to Mr. S. M. Cohen for his help in the preparation of this paper; to Mr. R. C. Thomas, with whom I have discussed the case; to Mr. J. Spalding, who operated; and to Mr. J. F. Hackwood, surgeon-superintendent, for permission to publish this report.

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Reviews of Books

Rehabilitation of the Tuberculous

(3rd ed.) H. A. PATTISON, M.D., F.A.C.P. London: Baillière, Tindall, and Cox. 1949. Pp. 250. 22*s.* 6*d.*

REHABILITATION has been practised by individual physicians for many years, and its value has long been known to all those who have studied the progressive recovery of patients from sickness to health; but it is only recently that it has been organised into a science with special institutions devoted to its study and practice. It is therefore valuable to have the collected experience of so well known an authority as Dr. H. A. Pattison restated in the third edition of his book.

The work is divided into two parts. The first deals with the concepts of rehabilitation and in the second some of the most important rehabilitation centres, in both Europe and America, are described. The latter section is well illustrated and the author gives interesting comments at the end of most of his brief surveys. The details given of the American rehabilitation centres are clear and concise, but in the accounts of some of the English centres the information needs bringing up to date. It is unfortunate that there is neither mention of the activities of the Remploy Corporation Ltd. nor any account of the Disabled Persons Employment Act of 1944, which has enabled so much progress to be made in rehabilitation in this country.

In the first section, the technique of rehabilitation is described and illustrated by many interesting cases which have passed through the author's hands. There is a particularly valuable chapter on aftercare, which deals mainly with compensation of tuberculosis as an occupational disease. Another very useful chapter is the one on the mental aspects of tuberculosis, and it is noteworthy that the author considers that "the misfits and maladjusted among the tuberculous may be different in kind and degree" but that "it is doubtful if they show more personal maladjustments as a group than are to be found among the general population." It is also reassuring to find that "an adequate programme for rehabilitation is essentially an amplification and extension of the general programme for control of tuberculosis," which means that rehabilitation is part of treatment and should not be considered separately when dealing with tuberculosis.

The book touches very lightly on the clinical side and tends to be rather vague on such matters as selection of individuals for rehabilitation, aptitude tests, and estimation of the patient's fitness after rehabilitation. This is probably because the book is intended for both physicians and laymen. It is rather surprising that allergy and immunity are dismissed in four pages and that there is no reference to the protection by vaccination of children born in tuberculous households. Many long quotations from other writers tend to confuse, owing to the many opinions expressed; this is especially noticeable in the chapter on fatigue. With these exceptions, the book is readable and the subject matter is stimulating and interesting. The author is at his best when describing his own methods at the Potts Memorial Institute, and those interested in the employment of the tuberculous will gain much useful information on the management of a rehabilitation centre. More detail is required on the financial side, particularly as regards the income of those being rehabilitated and the losses that have to be borne by the authorities responsible for the rehabilitation centre. It is estimated that a rehabilitated case of tuberculosis in an industrial employee has cost somebody $4000. The book is clearly indexed and well produced and can justly be described as a "readable record of observations and experience."

Practical Lessons in Psychiatry

J. L. FETTERMAN, M.D. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1949. Pp. 342. 30*s.*

Dr. Fetterman's book is a fair example of the uninspired, honest, reasonably well-informed textbook exposition, "sprinkled" (as the dust-cover says) "with excerpts from case-histories," and giving chapter and verse from recent writers. It is built up from lectures delivered by Dr. Fetterman to student officers at the School of Military Neuropsychiatry during 1943 and 1944 and from seminars held in 1945 and 1946. There is a lengthy chapter on treatment of affective disorder by electric convulsions, in which the author seems more at home than in the treatment of psychoneuroses, though in the chapter on the latter theme he is more helpful to the practitioner than many more pretentious therapists.

Public Health in the World Today

JAMES STEVENS SIMMONS, *dean and professor of public health, Harvard School of Public Health.* Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1949. Pp. 332. 27*s.* 6*d.*

THIS book, with its foreword, is composed of 29 contributions from different authors who presented papers at a series of public-health forums held at the Harvard School of Public Health in 1947–48. The purpose of the conferences was "to develop a clearer picture of the evolution, scope, and objectives of the profession of public health; to focus attention on today's complex problems in the fields of national and international health, and to stimulate realistic thinking about the solution of the problems." It does all those things well but in the main remains an account—a useful account—of public health in America, with little reference to other parts of the world. Martha Eliot (of the Children's Bureau) does something to extend the range of the book by her impressions of the state of children everywhere; Marshall Balfour of the Rockefeller Foundation gives some simple facts about the numbers of doctors, nurses, and hospital beds in India, Ceylon, and China, and about mortality figures in these countries; the medical director of a fruit company tells what his company is doing in South America to promote healthy living in native habitations; the medical director of the Health Service office of international discusses world coöperation in health. American public health ranges over the health as a profession during the 30 years American Public Health Association; medical care in Baltimore; the health and preventive medicine as ments; the development of the U.S. vice as a counterpart of our Ministry of interesting differences); preventive work Army and Naval Medical Services; Veterans Service (which seems to Ministry of Pensions); the views of the American Red Cross on voluntary development of industrial medicine (as poisons) in the U.S.A. The book shows the public health as an entity not to be curative medicine, its expanding scope, and collaborate with other professions and interest of health generally—a useful on the bookshelf.

Hungerkrankheit, Hungerödem, H

Historische, klinische, pathophysiologische, gisch-anatomische Studien und Be ehemaligen Insassen aus Konzentrat HOTTINGER; P. GSELL; E. UEHLINGER; A. LABHART. Basle: Schwabe. 1948. Sw. fr. 28.

IN the spring of 1945 the Swiss made with the Germans to take over the care of soldiers who were severely wounded or sick, ended before this plan could be put into the Allied soldiers were accordingly Swiss authorities, therefore, opened their inmates of concentration camps, and the passed through their hospital service at clinical basis of this book. It opens with a sketch by Salzmann, and the clinical and logical chapters have been written by Gsell respectively. Uehlinger has contributed on the post-mortem findings and morbid Labhart the chapter on tuberculosis. Some —e.g., those on the skin and on the typhoid complications—were written jointly. Thus the subject was handled by an expert, and the produced a valuable if largely descriptive book. it is the same old story, for it is hard to say even about the severest degrees of undernutrit these authors had the great advantage over most predecessors that they were themselves well and surrounded by all the facilities of a well- medical service. They could therefore take an view of the situation and make all the modern tions which seemed to them desirable. Some example, was subjected to plasmaphoretic analy pictures are very revealing, but the general photo is not always first-class, and the lighting and foresho suggest that it was the work of an amateur. The micrography and X-ray reproduction, on the oth are excellent. Many detailed case-histories are and treatment is discussed, but unfortunately no quantitative information about the dietary Furthermore, the book contains little or no exper matter—not even renal-function tests—which that the authors did not make the most of their tunities. The work, though not inspired, may be mended to anyone who requires good modern inf about the effects of overcrowding, neglect, and nutrition—about famine, in other words, and all entails, and has entailed since civilisation began

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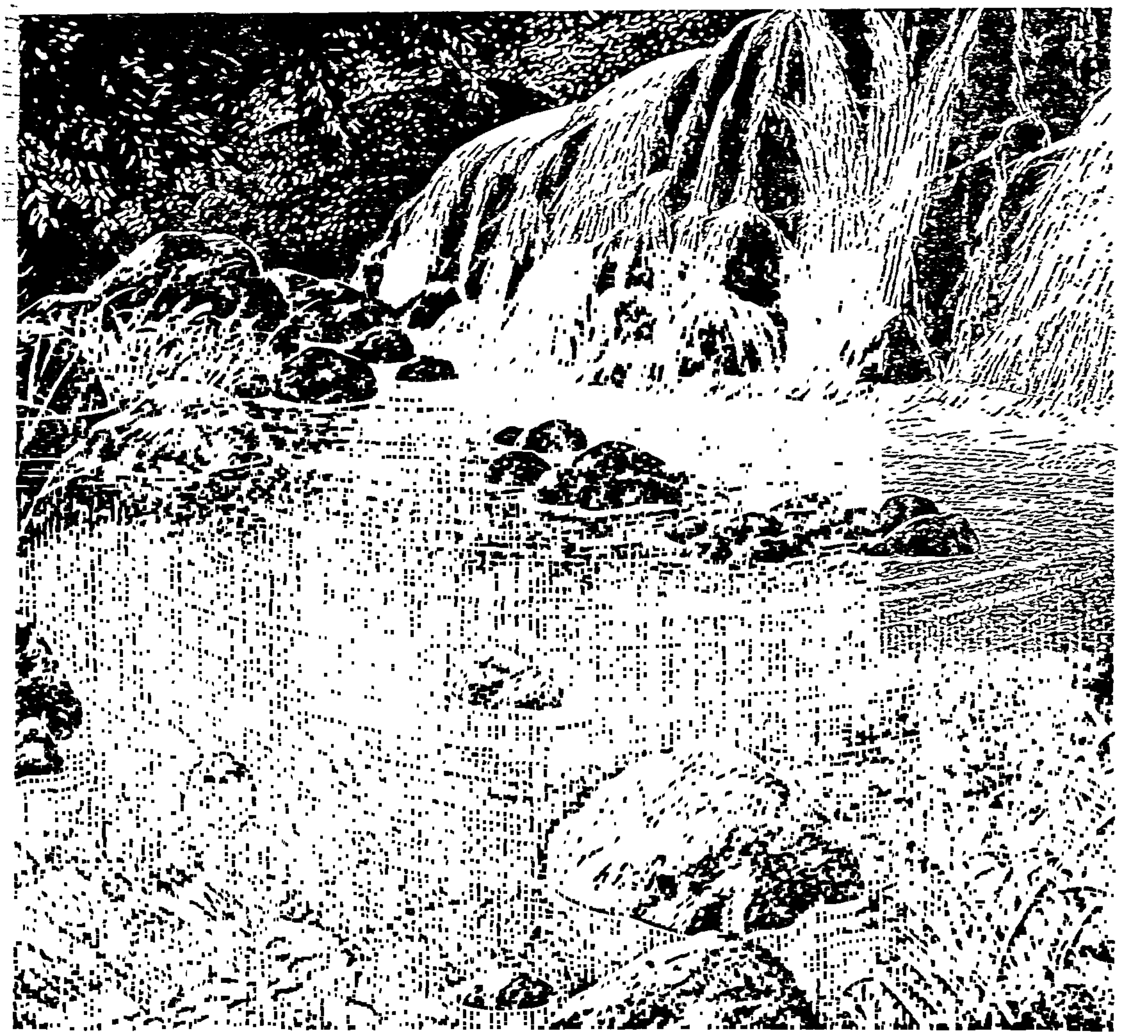
A History of Oto-laryngology (Edinburgh: Livingstone. 1949. Pp. 155. 17*s.* 6*d.*).—This brief by Dr. R. Scott Stevenson and Dr. Douglas Guth much to its larger predecessors, but its authors write ally readably. The chapter headings are so well the material so well sifted, presented, and illustrated feat of compression can scarcely be appreciated ear, nose, and throat specialist will derive pleasure as profit from reading this book.



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THE LANCET

NDON: SATURDAY, SEPT. 17, 1949

Seeing The Patient Through

front of this issue Dr. LIPSCOMB describes
atient can go through the machinery of a
and emerge but little happier or wiser.
patient doctors reading his hypothetical case
will feel uncomfortable because it is so true.
Mrs. A's outpatient card bears the famous
Dr. X, she passes through the hands of so
fferent doctors on the circuit that she loses
forting feeling "this is my doctor," and the
oo lack the conviction "that is my patient."
y ends with Mrs. A still an outpatient—
tened and unrelieved but with the seeds of
xieties germinating within her. Obviously
onal relationship and mutual confidence that
arise between doctor and patient cannot be
he patient is thus hustled from one person to
; yet the mere size and complexity of the
machine make divided responsibility inevit-
What can be done about this? Consider the
lities involved in this medical march.

the practitioner cannot be too careful in
g which patients to send to hospital. He
elect cases that are likely to benefit from
methods and try not to clog the hospital
h chaff. If he is reasonably sure his patient's
nt is nothing serious or specifically treatable
wise to use the hospital as a means of allaying
at he might well dispel himself.

the clinical assistant: he may have a very
time because he is often given the less
sting" cases—those with vague and indefinite
ms. Actually, to exclude possible disease in a
with a minor complaint is ten times harder
liagnosing a straightforward case of major
so in practice the junior man is being given
ost difficult work. If the more senior men
larger share of these cases they might save
admissions and investigations which the junior
tes through over-caution or inexperience.
r, the clinical assistant (as in the example
ed by Dr. LIPSCOMB) does not do inpatient
and once he admits a case he loses contact
t. There is much against this system, and
mes it would be better for outpatient clinical
nts to be converted into housemen and work in
rds. Another cause of loss of continuity is the
e of admitting a case "to come into medical
" with no guarantee that it will be a ward belonging to the firm who saw the outpatient. Whenever possible a firm should admit its own outpatients. Many of us, wandering in some far-flung ward, have accidentally come across an ex-outpatient of our own; and, as we mutter "I didn't know you'd come in yet," and watch the patient's features light up at the sight of a familiar face, we feel guilty that we have lost touch with him.

The houseman's lot is not a happy one either. Often he has to decide what investigations are to be done; and, in order to ensure that his chief shall not call in vain for any test, he often orders too lavishly. If he has to decide which cases are to be followed in outpatients he may be too careful and refer too many. The houseman ordering investigations must learn to catechise himself, saying, "What might I find and what would I do if I found it?" He must join with his registrar in seeing that his patient's perambulations are not unduly extended. The attitude "Let's send her back to outpatients" or "let's order this or that test because there *might* be something organic" defeats its own ends, for the departments get cluttered up with vague cases so that there is not time to go into them properly. Outpatient departments are not meant to provide cover for the doctor but to provide comfort for the patient; it is better to go deeply into a few likely cases than to hurry superficially over a large number of possibles.

As Dr. LIPSCOMB points out, much responsibility devolves on the first assistant (now called senior registrar). He can make it his duty to see that every patient receives an informative and helpful talk before his discharge (unless his chief has already given this). He can see to it that letters are written promptly and contain not only a list of investigations but also helpful interpretation and comment upon them. (The practitioner wants to know the best dose of digitalis for Mrs. A; he is less concerned about her circulation-time.) And he particularly can help to achieve that essential coördination that will give patients a feeling of continuity.

Lastly the chief. He can do much to ensure continuity of doctor and policy by coördinating and supervising the activities of those working for him. Not only will the wheels then turn more smoothly but they will turn faster (for the increase of speed when a doctor sees a patient he already knows is remarkable). He can strive to arrange his assistants' work and holidays in such a way as to prevent the "bird-of-passage syndrome" described in Dr. LIPSCOMB's article, and he can, by conferences with his juniors, curb enthusiastic over-investigation and unnecessary reference of cases to other departments. Above all, he can see that on his rounds he not only holds important discussions with his retinue but spares a few words of encouragement and explanation for the patient. Of course he may be so burdened with other medical commitments that he largely stands aside from intervening in his patients' affairs, leaving decisions to the postgraduate assistants whom he trusts so well. He knows his patients will be well cared for; yet, as Dr. LIPSCOMB says, this standing aside "may make a subtle contribution to the failure of medical coördination." Perhaps chiefs should exchange some of their committee work for clinical work and try to achieve a larger number of visits. Could not the registrar class take a share of some of the committee work? They might be more impatient and intolerant of the cumbrous procedures—the shelving of decisions and the shuffling of responsibilities between committees, subcommittees, and boards, but by their very impatience they might imbue committees with more vigour and effectiveness. Another point: is it wise to label the patient as being under Dr. X except when Dr. X sees him regularly? Might not registrars have their names displayed on their desks, so that patients know them by their own name, and should not senior registrars have appointment cards of their own?

Many of these alterations may be impracticable in an established system: but there are other possible approaches. One good way of narrowing the gap between practitioner and hospital is to invite local doctors to hospital clinical meetings (designed specially for them) and to arrange sherry parties where they can exchange ideas with the hospital staff. Both these practices have worked well at some of the non-teaching hospitals. The keen practitioner, too, who comes to visit his patient in hospital should be spared a few moments' talk by registrar or houseman and not be made to feel that he is poaching. Another innovation now started at several hospitals is the printing of small pamphlets which are given to patients on entry. These little brochures explain in simple words some of the things the patient wants to know and tell him a little about the hospital. A wisely worded pamphlet can inform and interest the patient and explain everything from visiting-hours and ward routine to the way to get letters posted, or the correct way to deal with false teeth (please ask sister for a bowl and do not put them in *your locker wrapped up in a handkerchief*). Where they have been tried, these pamphlets are a great success and have certainly helped in seeing the patient through.

To summarise, the problem of "seeing the patient through" exists, and will continue to exist, for the same reason that a departmental store, though it gives a fuller service than a local shop, can never achieve the same personal touch. Dr. LIPSCOMB has done a service in bringing this problem to notice in so vivid and stimulating a way, and it is to be hoped that everyone concerned will seek methods of solving it.

Staphylococcal Cross-infection

THE staphylococcus, like the poor, is always with us, and we have come to accept its various manifestations —from infected cuts to boils and carbuncles—as necessary if unpleasant evils. When, however, pemphigus spreads through the maternity nursery, or a series of infected wounds crops up in a surgical ward, the hospital authorities are rightly alarmed and usually end by invoking the bacteriologist.

The successful application of the work of GRIFFITH and LANCEFIELD in tracing the sources and modes of spread of streptococcal infection raised hopes of similar successes with the staphylococcus, but early attempts to classify the organism were disappointing. The first advance was the recognition that all potentially pathogenic staphylococci, whether or not they produced golden-brown pigment, were ca coagulating human plasma: but in the s the source of outbreaks it was found that 40 contacts carried coagulase-positive staphyl the nose and upwards of 20% on the hand therefore necessary to subdivide pathogenic s cocci as GRIFFITH had done with Lancefield streptococci. This has been attempted—and part accomplished—by both serological typing.[1] These techniques, which require m and experience, are still being used in onl laboratories; but already they are yielding r great significance. It has been established t *carriers of staphylococci are usually persist* carriers of the same type,[2] and that the probably contaminated from the primary colonisation in the squamous epithelium of th vestibule,[3] *although the occasional heavy skin and the profuse growth of staphylococci* f scars, suggest that the hands may sometimes focus and not merely the vehicle for the organism. With superficial staphylococcal like sycosis barbæ, boils, and infected staphylococcus is often derived from the nos of the patient himself, and sterilisation of th vestibule or the skin surrounding a wound to prevent the occurrence or recurrence of infections.[4]

What happens in hospital infections? autogenous, or is the staphylococcus derived an outside source as with most streptococcal tions? The topical interest in the increasin of *penicillin-resistant staphylococci* in hospit munities and the use of phage-typing are gi part of the answer. Different workers[5] hav that 40–60% of staphylococci from hospital *are resistant to one or more* units of penicil that a similar high rate of resistant strains in nasal carriers among the hospital staff, wh incidence of resistant staphylococci in the community is still around 5–10%. In the cases cultures were sometimes obtained fr lesion after penicillin had been used; so the re strain may have been present in small number *the onset. However, in this issue* Miss R and Dr. THOMSON report from Sydney that hospital cases infected with penicillin-resistant lococci, the organism was derived from an *source in at least 54, and that only* 8 patients (a total of 196) had primary infections with pen resistant strains. Both the Australian workers BARBER and WHITEHEAD[6] have found that penicillin-resistant hospital strains belong to phage types, while the sensitive staphylococ distributed among many different types—a which substantiates the view that staphylo infections in hospital are mostly cross-infection the prevalent types.

The next step was to trace the mode of spre a pointer is the close correspondence, fou

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6. Barber, M., Whitehead, J. E. M. *Brit. med. J.* Sept. 10,

E and Thomson, between the phage types ses of the staff and in the lesions of the cross- patients. But it must not be too hastily i that nurses are the main foci or even the f infection. The high nasal-carrier rate of mic strains among them may simply reflect lococcus-contaminated environment in which t and bed-linen may be important reservoirs air a means of dissemination. It seems likely gh this was not apparently investigated— air number of the patients were also nasal of the prevalent types and may themselves ected their various lesions. It would also be assume that a staphylococcal nasal carrier as dangerous to his neighbours as is the occal nasal carrier. The infected wound and are possible alternative sources, and further ation is needed before a particular source or f spread is incriminated. The data so far that staphylococcal cross-infection may be in hospital and call for better standards in and nursing practice—for example, by the "no-touch" dressing techniques and dust- sive measures—instead of a too easy reliance biotics. Casualty departments, surgical and ty units, and the ear, nose, and throat wards e most vitally concerned, and we would urge he need for "cross-infection" committees to earer that first requirement in any hospital— shall do its patients no harm.

Graphite Pneumoconiosis

HITE, or plumbago, which is a crystalline carbon, is perhaps best known as the "lead" ils or as the "black lead" used for polishing and grates. It is also used in making plumbago es, pigments, and lubricants, as well as being a uent of crucible steels and alloys and some of rubber. Commercial or natural graphite, is mined in the U.S.S.R., Korea, Madagascar, , and elsewhere, contains usually about 10% silica, but some samples have as much as An artificial form of graphite made from onsists almost entirely of carbon and is used bon electrodes. For most purposes graphite be ground to a fine powder, and some methods iding are very dusty. Until recently the dust phite has not been thought to damage the or at most to set up a mild form of pneumo- is. And indeed, the evidence that lung damage ise from artificial or nearly pure graphite, as ed to natural graphite which contains free silica, slender.

e light has been thrown on the subject by ecent papers describing the histology of the of workers inhaling natural graphite dust. NE and his colleagues[1] describe the clinical, graphic, and occupational features in two men ad inhaled dust containing graphite, free silica, ertain silicates. Both men had massive pro- ve fibrosis of the lungs superimposed on dust lation. At necropsy the lungs were black from ite dust, and this dust had also mixed with bron- mucus to form a slimy glistening black secretion oozed from the cut bronchi. Massive nodules of silicosis were present, some of the masses having broken down to form ragged cavities containing a similar black secretion. The histological pattern of the lung lesion was that of a dust reticulation with superimposed conglomerate nodules of silicosis and mixed nodules resembling those found in the lungs of coalminers. "Graphite bodies" similar to the "anthracosis bodies" of coalminers' lungs were present in large numbers. The three men whose cases are fully described by Harding and Oliver[2] had more clear-cut occupational histories, in that they were exposed to the dust created by grinding natural graphite without the addition of free silica and silicates. These writers also describe the radiographic appearances in other workers employed at the factory, where two of their fatal cases had worked; and to complete the picture the results of animal experiments are included. The clinical and radiographic features of one of their cases were previously described by Dunner,[3] who focused attention on the subject but was misled by the workers' statement that they had been handling "pure" graphite. The gross morbid anatomy and the histology of the lungs of the three fatal cases are similar to those in the two cases described by Gloyne and others, both teams of investigators drawing attention to the striking resemblance between the pneumoconiosis of graphite workers and of coalminers.

Harding and Oliver say that long exposure to substantial concentrations of graphite dust can produce a pneumoconiosis which may result in complete incapacity for work and may ultimately be fatal. A striking feature of many cases is the relatively slight physical incapacity in relation to the radiographic findings, and it appears that graphite pneumoconiosis is often well tolerated until the late stages. The radiographic picture is not that of classical silicosis, nor is the histology typical of silicosis: nodules resembling those of classical silicosis may be found, but more commonly the picture is one of pigment aggregates with linear or radial fibrosis and an accompanying focal emphysema. In advanced cases massive areas of fibrosis occur without definite nodular fibrosis.

It was Thackrah of Leeds who said, in the early part of last century, that all dusts may damage the lungs but that some may damage them more than others. The more the effects of various dusts on the lungs are investigated the clearer it becomes that when even small quantities of free silica are present in mixed dusts serious lung fibrosis may be set up. Until lately it was thought that free silica must be present in large quantities (of the order of 60–80%) to cause silicosis. The mixed dusts containing small proportions of free silica do not always cause classical silicosis with its typical whorled nodule; the pattern of the fibrosis is often more linear and radial. This was pointed out by Harding and others[4] in their descriptions of the lungs of boiler-scalers exposed to the inhalation of dust containing carbon, iron, and silica, the free silica comprising less than 6%. Graphite pneumoconiosis (from exposure to the dust of natural graphite) evidently falls into the same category.

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4. Harding, H. E., Tod, D. L. M., McLaughlin, A. I. G. *Brit. J. industr. Med.* 1944, 1, 247; *Ibid*, 4, 100.

Annotations

CRYSTALLINE TOXIC FACTOR FROM AGENISED FLOUR

Sir Edward Mellanby's[1] alarming discovery that flour prepared with nitrogen trichloride ('Agene') can cause "canine hysteria" has been followed by an intensive investigation of its possible adverse effect on man. This study has so far brought to light no substantial evidence that it harms man; but workers have been hampered by their ignorance of the responsible factor.

Moran[2] soon found that this factor was associated with the protein fraction of flour, since when the search has been steadily narrowed. Now Moran and his colleagues[3] at the Cereals Research Station appear to have isolated the factor itself. This is a crystalline material, giving a constant atypical ninhydrin reaction. Twice recrystallised from aqueous ethanol, the material retains the same degree of toxicity. The needle-like crystals melt sharply with decomposition at 232°C. A preliminary qualitative test has revealed an appreciable sulphur content. Identical crystals have been prepared from separate batches of agenised flour, but have been absent from unagenised flour treated as for the isolation of the crystals. The substance is highly toxic to rabbits, in which it produces convulsive fits; it is also markedly toxic to the organism *Leuconostoc mesenteroides P*-60 at a concentration as low as 5 µg. per ml. of liquid medium.[4]

A HUNDRED CENTRES?

At the Trades Union Congress at Bridlington last week, the representative of the Association of Building Technicians proposed a resolution calling on the Government to sanction the building forthwith of a hundred health centres, and to plan for the completion within ten years of a full programme of health centres for the whole country. The resolution was supported by the Medical Practitioners Union but opposed, we are told, by the platform—not apparently because the leaders of the T.U.C. were out of sympathy with the demand for health centres but because they doubted the wisdom of tying trade-union policy to so specific a number of centres as was suggested. Nevertheless the resolution was passed by an overwhelming majority.

From the moment they received the Minister of Health's circular of January, 1948, many local authorities banished health centres into the Never-Never Land of long-term planning; and we can only welcome any effort that brings them back into the realms of reality. In the debate at Bridlington it was argued that the immediate building of a hundred centres could be undertaken with no more than a 1% reduction in the rest of the present programme of building and civil engineering. It is, of course, for the Government to say whether the country can yet afford the capital expenditure and the diversion of constructional effort that even this 1% load would involve; but there is certainly a very strong case for starting this new development on an appreciable scale at once. The profession would be right in opposing the indiscriminate building of health centres before there has been proper experiment in different types of practice in different types of centre; it would probably say that ten years for the full programme is far too short a time in which to apply fully the experience that will be gained in the first centres—experience that may considerably modify present conceptions of health-centre design. Again a hundred centres may be more than we essentially need for these first practical tests; they may, indeed, be we should find it possible to launch at once wi unanimity of purpose of doctors, executive and local health authority that will be in if initial difficulties are to be overcome. knowledge that the continued popular demand faith in health centres has been so strongly e in this Congress of Trades Unions will certainl all who have continued to pursue the vision lately, the receding vision—of general practi modern conditions.

THE PHAGE-INFECTED BACILLUS

The parlour tricks of the eighteenth-century now seem as ingenuous as ingenious, yet philosophical trifling the modern methods of all have developed. So it is that mere improv optical technique applied to minute bodies—dar illumination with the bright sun of Pretoria, and phase-contrast microscopy—are per se no idle amusements to the bacteriologist until applied to his particular problems. These have in fact more than justified themselves, and there could be no better example than Boyd's the phase-contrast technique to observe the mo of *Salmonella typhi-murium* when brought into with specific bacteriophages. In general the "in of the bacillus was revealed by the developme enlarging pale area in its substance. A fatal out signalled by the distension and bursting of the the attainment of symbiosis by the appearance areas whose enlargement was limited and by d of the shape of the bacillus; a lysogenic sym similar phenomena which are easier to apprec the illustrations than to describe.

The camera cannot lie; but, rememberi cunning photographs which look like sunrise in desert and are in truth the bristles of a tooth close range, we have learnt to be cautious in conclusions from a technique of which few of experience. However, if the pale areas whic describes are not the multiplying phage itself, Lombard Street to a china orange that they are in connected with the infection, since they are absent from organisms which have had no cont a specific bacteriophage. This is a new tool bacteriologist, and we shall look forward to future use and possibly abuse. Perhaps parallel nations with the electron microscope would not only further information but also a usefu on the validity of the interpretations of techniques.

ASPIRIN AND THE ACID-BASE BALAN

Conflicting accounts[2,3] of the effect of sa on the acid-base equilibrium of the blood in child Farber and others[4] to undertake a comprehensive in ten healthy men. The subjects were kept during the experiment and were given 1·3 g. of by mouth every hour for 8 doses and then 1·6 g. 9th hour, making a total of 12 g., which is the higher dosages recommended in the treat rheumatic fever. Eight of them developed sym of salicylism after the last dose. In seven ca symptoms persisted for about 8 hours, and the man still complained of tinnitus after 48 hours. salicylate, serum pH, total CO_2 content of the respiratory volume, respiratory rate, and red-ce were estimated before medication was begun an

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[1] Mellanby, E. *Brit. med. J.* 1946, ii, 885.
[2] Moran, T. *Lancet,* 1947, ii, 289.
[3] Bentley, H. R., McDermott, E. E., Pace, J., Whitehead, J. K., Moran, T. *Nature, Lond.* Sept. 10, p. 438.
[4] Heathcote, J. G. *Ibid,* p. 439.

[1] Boyd, J. S. K. *J. Path. Bact.* 1949, 61, 127.
[2] Fashena, G. J., Walker, J. M. *Amer. J. Dis. Child.* 194
[3] Guest, G. M., Rapoport, S., Roscoe, C. *J. clin. Inv* 770.
[4] Farber, H. R., Yiengst, M. J., Shock, N. W. *Amer. J* 1949, 217, 256.

ours for 16 hours and again at the 28th hour.
nd that the serum-salicylate level reached its
ours after the last dose of aspirin and then
t a uniform rate for the next 18 hours. No
changes were observed in the respiratory rate,
spiratory volume rose by an average maximum
of 4 litres per minute 2–4 hours after the peak
cylate level. The CO_2 tension of the blood and
onate concentration of the serum were calcu-
neans of the Hastings-Shock nomogram [5] from
ell count, pH, and total CO_2 content. The
n the acid-base balance were a raised pH, a
O_2 tension, and a reduced serum-bicarbonate,
num displacement occurring at 4 hours after
dose of aspirin, though some displacement
19 hours later. Plotting the values for pH,
on, and bicarbonate showed that the pathway
ement was along the CO_2-absorption curve for
ood, proving that the changes were due to
y effects.

his experiment it is clear that therapeutic doses
in healthy adults can produce a respiratory
lasting at least 20 hours after the last dose.
irin is commonly given to feverish patients,
hyperthermia may itself cause hyperventilation,
that the total effect of hyperventilation from
from aspirin could lead to a severe respiratory
Alkalis are commonly given to patients with
and they seem to hasten the removal of
s from the blood; but it should be borne in
t there may be a risk of alkalosis.

TREATMENT OF THE TRAMP

PS the most interesting section of the latest
om the National Assistance Board [6] is the one
ures taken to deal with people who were formerly
as "casuals" or vagrants. With a new sense
cy, the label has been changed to "persons
a settled way of living," but the essential
remains. Fortunately its dimensions, if not its
have greatly changed from what they were in
s of industrial depression. On a night in May,
fewer than 16,911 men "on the road" were
elter in what would now be called a "reception
By September, 1939, the comparable figure
7, and the war reduced it further. After the
upward trend began; but even by last December
l number of men, women, and children accom-
l in these centres was only 2368.

e past, the main emphasis of treatment lay on
elter, medical care, and disinfestation. (As a
mallpox outbreak showed, the infected migrant
se rapid dissemination.) With the new outlook
lic assistance in general, the focus of interest
shifted to re-establishment, whereby persons
at a settled way of living may be influenced to
more settled life." The methods adopted
ly vary as much as the individuals themselves
early useless to try to assuage the wanderlust of
er men of the "tramp" type, but much can be
r youths who have run away from home after a
or some indiscretion. Medical care still plays a
ut social reablement remains the prime thera-
agent. Within the centre itself firm discipline is
l; younger men, for whom more hope can be
it, must be divorced from the influence of the
ed drunkard or gambler whose bravado in defiance
ority is only matched by his boasting of the ease
hich he can live at public expense. For the
of the National Assistance Board and their colleagues in the Ministry of Labour the attempt to place and maintain men in employment can be a dispiriting task. In one centre, of 17 men who accepted employment in the course of a week only 2 were still working at the end of it: but some young men have volunteered to train in coalmining and gone on to work successfully in the mines. As long as it is possible to salvage even a few men from a life of degradation, the board's officials are determined to believe that where there's life there's hope and to encourage as many as possible to live as normal decent members of the community.

The modern wanderer no longer goes on foot; by lorry-jumping he can travel hundreds of miles in a day. New centres are therefore being set up only at considerable distances from each other. It is clear that physical care and occupational readjustment at such centres offers no real solution to this problem. In social work, as in medicine, prevention is better than cure, and the hope for the future seems to lie in the provision, by either municipal or voluntary effort, of good cheap hostels for young working men.

PHARMACY AND PHARMACOLOGY

THE pharmacist is no longer true to Romeo's description:

> "Sharp misery had worn him to the bones:
> . . . and about his shelves
> A beggarly account of empty boxes, . . ."

On the contrary, so prosperous and prolific is the pharmaceutical industry today that we may more appropriately exclaim with Nerissa: "They are as sick that surfeit with too much as they that starve with nothing." The reason for this happy transformation may be found in the chairman's remarks to the Pharmaceutical Conference at Blackpool this week. In his address Mr. Norman Evers maintained that pharmacy is not a science in itself but an art that makes use of many sciences; and in developing this theme he referred to the various divisions of his subject, most of which are so technical that any physician hearing him must have acknowledged the mercy of providence which placed him at the bedside rather than in the laboratory.

In most professions there is a tendency to define the curriculum precisely, to be wary of expansion, and to resist encroachment from without. The pharmacist takes the opposite view, expressed long ago by Daniel Hanbury: "All science is interesting to us since almost every scientific discovery may sooner or later, directly or indirectly, yield some results profitable to pharmacy." Paradoxically this liberal philosophy has led to intensive specialisation, but the profession and trade are to be complimented on the coördination between their various branches; the leading pharmaceutical manufacturers have shown what can be achieved by imaginative organisation and unrelenting effort. Still, the pharmaceutical industry has its problems. Mr. Evers referred to one of them—namely, patents, which he described as "the bugbear of the industrial worker." A by-product of the patent system is the multiplication of preparations of the same chemical substance, resulting in confusion and exasperation among not only doctors but pharmacists themselves. The solution lies in compromise between the legitimate claims of original workers on the one hand and the best interests of the community on the other, and this is not easy to attain. Pharmacy has considerable achievements to its credit, but here, as in other walks of life, most men with inventive talent still sell their services to the highest bidder; and interference with this relationship may deprive the public of great advances in the means of treating and preventing disease. Belief in private enterprise is nowhere stronger than

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ngs, A. B., Shock, N. W. *J. biol. Chem.* 1934, 104, 575.
t of the National Assistance Board for the year ended
31, 1948. H.M. Stationery Office. 1s. 3*d*.

among manufacturers of pharmaceuticals, but the most enlightened firms are aware that patents may be open to abuse by the creation of monopolies; and critics of large-scale amalgamation of industrial concerns are quick to point out that this process is fraught with special dangers, including the virtual extinction of private enterprise and fair competition.

Mr. Evers very properly made a plea for the proper organisation of pharmaceutical research, indicating in particular the need for more research on behalf of the *British Pharmacopœia* and the *British Pharmaceutical Codex.* "It is surely important from the public point of view," he said, "that the official pharmaceutical formulæ should be the best possible and that the amount and quality of research which is applied to their formulation should be at least equal to that which would be given to the subject by a manufacturer." Nobody will dispute this, but many doctors are not aware of the scope of the *B.P.* and the already high standard of official preparations. Perhaps this ignorance is due to the fact that most medical students are taught pharmacology by lecturers who are not clinicians, and therapeutics by clinicians who are not [illegible] further official publication—the [illegible] must become increasingly valuable to the practitioner as a reliable source of prescriptions incorporating official remedies; and it would be well if the student could be introduced to this book at the start of his clinical training.

PREDISPOSITION TO DIABETES

HEREDITY is now generally accepted as an important factor in the ætiology of diabetes mellitus, but neither the mode of transmission nor its precise rôle is clear. A report from Glasgow,[1] based on a group of 1309 diabetics, provides some new data. In 997 of these cases (91·4%) the age at onset of the disease, as judged by symptoms, was over 40 years. There were 2¼ women to each man in the whole series, though up to the age of 40 the sexes were about equal. After 40 the frequency in women rose rapidly, whereas in men the rise with increasing age did not become obvious until 50 and even then was much more gradual than in women. This high frequency in middle-aged women was confined to married women, and seemed to be related to previous childbearing. In women maximum weight was significantly greater in diabetics than in controls from the age of 20, but male diabetics were no heavier than normals until after 40. Married women were heavier than single women in both diabetic and control groups. Mean systolic blood-pressures were not significantly higher in male diabetics than in controls; in females, however, the pressures were significantly higher in diabetics than in controls after the age of 30, and this could not be correlated with either obesity or previous childbearing. The onset of symptoms was associated with sepsis in 6% of cases; but these were mainly middle-aged patients, and the proportion (18%) with a family history of diabetes did not differ greatly from the proportion (23·3%) among all others in the series. Such a family history was obtained less often as the age of onset increased; but family history was unrelated to the severity of the disease. A family history of diabetes was as common among diabetics with obesity, hypertension, and sepsis as among those without these complications; while the proportion of familial cases was significantly lower among female diabetics with large families. Thus there is no proof of partial sex-linkage and no convincing evidence that the age at onset is determined by heredity. The recognised ætiological forces can be divided into: (1) hereditary, and (2) others—including obesity, childbearing, and sepsis —which increase innate susceptibility.

The hereditary factor is discussed more fully by Harris,[2] who has studied over 2000 patients a College Hospital. He finds that the juvenile a adult form of the disease is much more likely to among the sibs of juvenile and young adult than among the sibs of middle-aged or elderly d —suggesting that the disease that starts in y young adult life is genetically distinct from that in later life. This is supported by the ob that when diabetes developed before 30 there was but significant increase of cousin marriages in the —an increase that was not evident in respect of developing after 30. On the other hand, not monly one or other of a young diabetic's parent diabetic, usually with diabetes of late onset; scarcely in keeping with the hypothesis of two distinct conditions. The discrepancy could be e however, on the hypothesis that the milder case onset are heterozygotes (i.e., carriers) for the s gene, whereas the more severe juvenile or adult cases are homozygotes. A further com is that among the siblings of female diabetics is commoner in men than women, whereas am siblings of male diabetics the disease affects sexes more equally. Yet another confusing f that the later the disease starts, the less likely reduce effective fertility. But if this were t factor determining the frequency of the effective the population, the disease would be getting less of more common. This apparent discrepancy be explained by assuming that some non-diabetic carry one or more of the genes which in ap combinations give rise to the juvenile form of the in offspring.

HYALURONIDASE IN PÆDIATRICS

HYALURONIDASE, a mucolytic enzyme obta many sources, including mammalian testes and has been found to promote the absorption injected intramuscularly or subcutaneously[3]; accelerates the absorption of penicillin, strep adrenaline, and procaine. The benefit of th enzyme is perhaps most evident in the treat children, where intravenous therapy is often frau difficulty; and in this issue Professor Gaisfor Dr. Evans show that dehydration in children as well to saline administered subcutaneou hyaluronidase as to intravenous infusions, altho response is rather less rapid.

Schwartzman[4] reports that of 158 children only allergic to hyaluronidase in the purest form av In his experience the optimal dose for parenteral in 80 µg. per area per dose, and any increase this amount does not further hasten absorption Gaisford and Evans, he finds that plasma is a when given subcutaneously with the enzyme; an infant with serious diarrhœa and an initial protein level of 4·7 g. per 100 ml., absorption took only after the protein level had been raised by a nary intravenous infusion. In anæmic childr received subcutaneous injections of whole bloo hyaluronidase, absorption was confirmed by hæmoglobin estimations.

If the potential value of hyaluronidase i exploited, a standard and highly purified pre will be needed. The material can be easily prepa bovine serum, which may be had in fairly large qu The potency of the enzyme is easily tested.

DR. N. HAMILTON FAIRLEY, F.R.S., Sir HARTLEY, F.R.S., and Prof. J. MCMICHAEL, F.R.C. been appointed members of the Medical Research from Oct. 1.

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[1] Munro, H. N., Eaton, J. C., Glen, A. *J. clin. Endocrinol.* 1949, 9, 48.

[2] Harris, H. *Proc. R. Soc. Med.* 1949, 42, 326. Contrib discussion reviewed in *The Lancet* (1948, ii, 1016).

[3] See annotation, *Lancet*, 1948, i, 291.

[4] Schwartzman, J. *J. Pediat.* 1949, 34, 559.

Special Articles

UNEMPLOYED DISABLED MAN

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blem of the unemployed man of today in the ircumstances of 98% full employment differs m that in the past during times of widespread ment of economic origin. The extent of ment among insured persons is governed by prosperity, and seasonal fluctuations of local Manchester is fortunate in having a great of industry which, at present, is constantly s labour requirements. Even so, of its 217,505 2729 remain unemployed. Of these, 1942 led as able-bodied, and 787 have been registered d persons under the Disabled Persons (Employ- t, 1944. These figures include both casual nd those temporarily stopped.

isabled Persons (Employment) Act, with its methods of ordinary placing, training, sheltered ent, and industrial rehabilitation, aimed at the resettlement in work of the disabled person. itended to bridge the gap between illness and rn to work which had long been known to Already 868,800 persons have registered their es, 790,311 are in employment, and 78,489 inemployed. These represent about 25% of unemployed, and the figure varies little in size iges considerably in composition, as is shown monthly placings of disabled unemployed at ichester Exchange between June, 1947, and 1948 :

te		Total of unemployed disabled		No. placed in ordinary employment during previous month
, 1947	..	840	..	308
,,	..	874	..	282
,,	..	754	..	358
,,	..	660	..	280
,,	..	732	..	393
,,	..	738	..	371
,,	..	675	..	340
,,	..	781	..	366
,,	..	816	..	378
,,	..	787	..	325

ialysis of the Manchester unemployed disabled, groups and length of unemployment, is provided I. Of the 773 disabled, every fifteenth man sing 50 in all) was interviewed and examined.

BLE I—ANALYSIS OF UNEMPLOYED DISABLED

f weeks iployment	Age (years)			Total
	18–40	41–55	56–64	
	66	39	17	122
	29	27	6	62
	22	24	10	56
	22	17	7	46
3	26	31	18	75
26	42	45	36	123
39	19	30	17	66
52	7	23	13	43
104	16	43	34	93
r more	10	35	42	87
tal ..	259	314	200	773

purpose of this investigation was to discover the of continued unemployment among registered d men when a state of nearly full employment .; to note to what extent joint medical and lay ls could secure permanent resettlement; and nment on the medical aspect of the problem.

he end of a year the employment position of the s of this group was reviewed to check the accuracy of the initial prognosis and to ascertain the success of the joint interviewing and its placing results.

MEDICAL FACTORS

Of the group of 50 men examined, 8 were aged 18–30, 11 were aged 31–40, 23 were aged 41–55, and 8 were aged 56–64. For a reliable prognosis total employment record had to be considered, since more often than not, together with medical and social history, it revealed a trend or changing attitude towards employment. All 50 men were substantially disabled and eligible for protection within the meaning of the Act. Apart from one man who sustained his disability within the preceding six months, the remaining other disabilities were long-standing, and many were congenital and many from the 1914–18 and 1939–45 wars. Much of the medical information available was out of date and had been provided by military hospitals in circumstances entirely different from those existing at the time of interview. Medical opinion appeared to have been given in many cases without consideration of the social history and, more particularly, the occupational record. A feeble-minded delinquent aged 22, who had been sent to seventeen jobs within the past year and had worked at five of them for a total of three months, was reported as being suitable for training in agriculture. His application for training was subsequently rejected.

The principle of medical examination with a view to assessment of functional capacity and selective employment without careful scrutiny of past work record and without the active coöperation of the resettlement officer was unsatisfactory. The most important single medical factor was a mental one, in the main that of personal attitude towards disability. This disability-consciousness was associated with a tendency to reel out symptoms and disabilities with extravagant ease, and the effect of their apparently imposed limitations on the man (" I can't do this, I can't do that " attitude) was sufficient to deter any prospective employer. Disablement resettlement officers (D.R.O.) were handicapped as placing officers in having to accept statements of disability from the men, and they seemed powerless to deal with many of the men because of their regard and literal acceptance of medical opinion on the limitations imposed by disability as shown on form D.P.1. More confusion arose in the following type of case: a man complained that he had a crushed foot, chronic bronchitis, stomach trouble, and rheumatism; he had been continuously on National Health Insurance sickness benefit from 1932 to 1937, yet, according to the medical report, he was not disabled.

Though not justified in attempting accurate diagnosis of mental disability, we agree with Lewis et al.[1] that one can record its existence without forming an exact diagnosis. In many cases psychiatric evidence from service medical records was available. The work record is a very important test of stability. It also provided valuable evidence of the relations between the man and his employers and fellow-workers, and, together with his educational record, behaviour record, domestic relations, and the result of interviews with the D.R.O., assisted in the assessment of his personality and emotional attitude. According to the records available to the D.R.O., 4 men were suffering from psychological and 46 from physical disability; but in fact it was found that 7 were physically disabled, 17 mentally disabled, and 26 disabled owing to a combination of mental and physical factors. There was a tendency for the disability label to be altered and for mental disability to assume an organic title, as noted by Halliday.[2] Thus, a man with a severe anxiety state, with tremors, and a recent history of long treatment in a mental hospital, was being dealt with as a case of chronic fibrositis.

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[1] Lewis, A., Capel, E. H., Bunbury, D. E., Fraser, R. *Brit. J. industr. Med.* 1945, 2, 41.

[2] Halliday, J. L. *Brit. med. J.* 1935, i, suppl. 85, 99.

The striking feature of the group was the pathological attitude of resentment, aggression, depression, and, in many, severe anxiety. Apart from the fact that they were mainly severely disabled, no comment seems necessary on the 7 with purely physical disability. The 17 cases of primarily mental disability included antisocial or psychopathic behaviour (6 cases); feeble-mindedness (5 cases); psychoneurosis (5 cases); and schizophrenia (1 case). Of these, 4 had minor physical disabilities, 2 slight bronchitis, 1 club-foot, and 1 with arteriosclerosis and premature senile changes. The remaining 26 cases included a wide variety of physical disability complicated by psychoneurosis, antisocial tendencies, or feeble-mindedness: 2 of these men urgently needed institutional treatment.

Most of the men were regularly or intermittently attending a general practitioner for treatment. The Labour Exchange records revealed that, during the preceding three years, 28 men had had spells of sickness, lasting 1–99 weeks, average 22 weeks. This recorded sick absence comprised domiciliary, hospital, sanatorium, and mental-hospital treatment. There was no record of sick absence during spells of employment, but many of the men said that sickness had seriously interfered with the jobs they had done in the past, either causing bad time-keeping or leading to their ultimate discharge or voluntary relinquishment of the job.

WORK RECORD

Attitude to work seemed paradoxically related to the extent of disability. Of the 16 classed as very severely disabled, 12 were well disposed towards work, and only 4 could be described as having a bad or indifferent attitude. Some of the more severely disabled had a will to work which was beyond their remaining abilities. The disquieting feature was that, of 34 men with slight or moderate disability, only 11 showed an attitude towards employment which was likely to commend them to employers, whereas 23 showed indifferent or frankly poor attitudes. Many of the older men, in spite of age plus disability, had fair attitudes towards employment.

At the time of interview the duration of unemployment for each man ranged from $1^{1}/_{2}$ to 33 months, the mean being 10 months, as follows:

Duration	*No. of cases*	*Duration*	*No. of cases*
6 weeks or less ..	6	13–18 mos.	8
7–13 weeks ..	8	19–24 ,, ...	2
13–26 ,, ..	12	25 mos. or more ..	8
27 weeks–12 mos. ..	6		

This does not imply that the men had worked for any length of time before becoming unemployed. Employment record varied between good, where the man had spent his whole life in perhaps one or two jobs, only, and bad, where there had been very long spells (up to ten years in some cases) of unemployment, or where a man, though not unemployed for long periods, had been engaged in a great variety of jobs, each of short duration, interspersed with periods of unemployment. One man, for example, had been sent to 99 jobs in the past two years but had held only 50 of them.

Of the 50 men, 38 had been in the Services, 19 of them in the 1914–18 war and 19 in the 1939–45 war. In 15 cases employment, or unemployment record, had not been altered by the period of military service. It was possible to detect slight interruption in 3 cases, and in 13 cases the effect had clearly been unfavourable to the man's subsequent record. Service had completely unsettled 7 of the men, and they had done little or no work in consequence.

Of the 50 men, 2 were capable of skilled work and 7 of semi-skilled work; the remaining 41 were unskilled—
i.e., fit for labouring. In the semi-skilled
were continually falling back on completely
work and could really be classed as general
Of the 50 men 12 had begun life as apprentices
1 man had completed his apprenticeship
worked for six years as a turner before the
after demobilisation in 1919 he did not return t
job, and he had so deteriorated that he was
carry a sandwich board for two days a w
remaining 11 had severed their apprenticeships a
periods and drifted to other types of unskill
The reasons given for interrupted apprentic
that 3 left to join the regular Armed Forces and
conscripted; in 2 cases the reasons were ob
complete absence of any real interest or attac
specific type of work was significant. Several
men had from time to time acquired a smat
skill, but all of them had descended the social
had acquiesced in their relegation to unskilled
In a few, loss of skilled work may have been at
to widespread unemployment at times of sl
with one or two exceptions, there appeared
interest, pride, or healthy association of former
to encourage them to return to their daily task

PROGNOSIS

All factors being taken into consideration
felt that 14 men were suitable for selective
industry; 8 were probably only suitable for
ment under sheltered conditions (Remploy F
10 were so completely unsatisfactory that the
of the exchange-employer relationship would be
if they were submitted for work; and 18 were
able unless their present unsatisfactory state
remedied.

EXTENT AND EFFECTS OF SUBSIDY

From various sources 13 men were receiving
sum of 20–30s., 11 received 31–50s., 8 received
12 received 71–90s., 4 received 91–110s., and 2
more than 111s.

Most of the men drew unemployment
extended benefit after they had exhausted their
benefit, 5 received money from public-assistance
ties, and 20 received war pensions (12 from the
war, and 8 from the 1939–45 war). A few
family allowances, and some received money
children who were working or from married
living at home. Four had received workmen's
pensation for industrial injuries for periods of
weeks, fifteen months, two years, and three
man had unsuccessfully claimed workmen's com
7 of the wives of the married men were wor
men had between them 22 children working,
home, and contributing to the household; and
married children living with their families
household and making contributions.

The older married men and widowers appeared
resigned to unemployment. This may have
to their better financial position or to their larger
ence of unemployment. Many were quite ha
live on the bare subsistence level provided by un
ment benefit. A few undertook a little casual wor
ing lorries, helping in the market, running me
earning a few shillings a day when they felt like
of those with the larger subsidies, in spite of th
of skill, inferior physique, and infinitesimal va
the labour market, were refusing proffered jo
wages less than £5–6 per week (more than the
receiving from the various forms of allowance
amounted to a refusal to work. Many of the
wives and older children working had exchan
household rôle of breadwinner for that of ma
work and were content to perform menial d
duties and mind the younger children.

st pitiful cases were the young single men and who were separated or divorced from their en mentally defective or unstable, and who quently run into a sea of troubles, the orderly police custody, and had gradually descended scale, left home for lodgings, for a single rented which they prepared their own food, and, r a hostel. This deterioration was apparent in their living habits but also in their neglect al appearance, particularly clothes and shoes, he associated loss of self-respect and self- e, which seemed to give way to depression, ı, and dissatisfaction with the world in general. his aggression was centred on the employment , and much of it appeared unreasonable in view lp they were being offered. Among the men king work a few received small charity in the ld shillings from better-off relations.

parated, widowed, and single men leading a xistence could not give an account of the use leisure. Walking the streets was the only and acceptable explanation offered. A few were y seeking work but had such obvious and severe es that they could not persuade employers to hem: The zest for seeking work appeared ish with the length of unemployment. Unem- t appeared to lead to unemployment. Two e nearing their 65th year and old-age pensions ; premature ageing, together with poor physique, ng a serious effect on their prospects of employ- A common allegation made by the men over of 40 was that employers were not interested In 6 cases periods in the regular Armed Forces er been recovered from so far as resettlement was d. The attitude of the pensioner and the post- ation case in this group appears to resemble the persons with neurosis in receipt of public ce described by Lewis.[3] As regards a Hindu roup, colour seemed to contribute to his difficulty ining employment. Personality and mental excessive subsidy, physical disability, and age, order, were of importance in hindering return to

EDUCATIONAL RECORD

men had received more than a basic elementary on, 2 had attended grammar schools, 1 a central and 1 a night school for a year (the first year of his iceship, which was subsequently broken). Twenty ched the top standards of their schools, whereas not done well at school. The Indian had never school at all, 2 had been to special schools for defectives, 6 had attained standard 4 only, ard 5, 9 standard 6, and 5 standard 7 when the ndard was X7. Of these 26 who had not done school, 4 had had their schooling seriously pted by long spells of sickness, and 1 had had me family responsibilities at an early age on the of his parents.

BEHAVIOUR RECORD

r as could be ascertained, 5 men had served prison es ; 3 of these had had multiple convictions of including 1 who had also served a three-year at Borstal in his youth ; 2 others had had minor s preferred against them for theft, &c., and had short spells of imprisonment ; and 4 others ad bad military conduct records and had served s of detention in military barracks for desertion, rdination, &c.

MARITAL STATE

he whole group of 50 men there were 38 who had narried : 5 of the marriages were childless ; 7 men nly one child, and, at the other extreme, 1 had thirteen children, and 1 had ten ; 3 men had one mental defective child ; and the average number of children was four. Of the 38 men who had been married 12 had been either separated or divorced, but 1 of these had been happily remarried. Of the married men 22 were living with their families in rented accommodation, 3 widowers were living by themselves, and of the 12 separated or divorced men, apart from the 1 already mentioned, 2 had returned to their parents. 8 were living in lodgings, and 2 were living with female housekeepers. Of the 12 single men 3 were living in lodgings and 9 with grandparents, parents, or siblings. Much distress, unhappiness, and bitterness were associated with this picture : some of the separated men were having difficulty over separation allowances, one man was repeatedly being committed to jail for failure to pay maintenance allowance, and he and another seemed reluctant to take up employment because they would have to pay allowances to their wives and families if they did. Of the 12 separated men 2 had physical disabilities : 1 had tuberculosis ; 1 had very severe deafness with an associated anxiety state (he had written to several M.P.s and Cabinet Ministers about his unemployment) ; and in 10 the main disability appeared to be mental.

INTERESTS

Most of the men said they had no money for betting, football pools, cigarettes, beer, &c. A few had hobbies, mostly connected with their former work—e.g., radio repairs, and decorating. Four read (2 literature, 2 "wild westerns") ; and several were interested in horses and many more in football. In general, however, they showed lack of interest in life, poverty of thought, and absence of expression. Apart from a few with interests in families and the accomplishments of their children and grandchildren, few shared the satisfactions of life well described by Bakke [4] and more evident in the skilled than in the unskilled worker—i.e., the pride of being producers, of attachment to the personalities of employers, and the prestige of the wage packet, of club or union membership, or of hobbies and interests. Not one of these men owned his own house.

FOLLOW-UP

Two follow-ups have taken place, one six months and the other twelve months after the initial interviews. In the second it was found that 12 men had been placed in jobs by the employment exchange, 5 had found work for themselves ; and 1 man was being trained at a residential college for the severely disabled. Fifteen other men were not now signing the unemployment register for various reasons ; 2 had been transferred to other local offices ; 2 were receiving old-age pensions ; 1 was sick ; 3 were probably sick ; 3 were probably working on their own account ; 2 were wandering the country ; and there was no information about 2 others. Seventeen men were still, or again, signing the live register and remained unemployed ; 11 of them had worked for fourteen days or less, and most of them not at all, in the past year. Most of the men working had been very carefully placed in jobs specially canvassed for them by the resettlement officer with employers ; 3 men had been placed after courses of industrial rehabilitation. Many of those unemployed had had periods of sickness in the intervening period, and 1 man had had a further spell in prison.

CONCLUSIONS

Unemployment in the midst of full employment is the worst type of unemployment. Present unemployment is a medicosocial rather than an industrial problem. The unskilled man is the greatest sufferer, and the attitude of mind of the disabled man is the largest single factor in determining the prospects of future employment. By careful social occupational and medical assessment an accurate prognosis can be given. A third of these men can be restored to full employment, which brings with it well-marked improvement in physical and mental condition. A third are unemployable; they sign on regularly for work at employment exchanges, draw unemployment benefit, provide a depressing medicosocial and occupational problem, and handicap the work of the resettlement officer. The remaining third cannot be placed in any certain category.

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[3] Lewis, A. *Lancet*, 1935, ii, 293.

[4] Bakke, E. W. The Unemployed Man. London, 1933.

Unemployed disabled persons are an equal burden to those operating the medical and social services and to employers. They are responsible for much wasteful changing of jobs. Many of these men are unsatisfactory and never likely to be permanently resettled. Practical assistance to the group can often be provided by a joint medical and social approach, but neither independently can hope to succeed. Recognition of the social state of the man and appreciation of his occupational and medical problems could lead to the institution of *prophylactic measures before complete disablement* supervened. Continued attendance for medical treatment and medical rehabilitation tends to emphasise disability, and removal from this atmosphere to one of more hopeful industrial rehabilitation, with the accent on remaining ability and concentration on recovery of self confidence, may be the most fruitful line of approach.

I am greatly indebted to the regional controller and other officers of the Ministry of Labour and National Service for making this survey possible, and to Dr. J. H. Twiston Davies for invaluable advice and criticism. The views expressed are personal; and the conclusions may not apply throughout the country.

INDOOR INVALID CHAIRS

FROM A CORRESPONDENT

Having had to use an invalid chair for three years, I *have some rather critical remarks to make on the* design and comfort of them.

I am 6 ft. tall, weigh about 12 st., and have rheumatoid arthritis, which affects most of my joints and is gradually getting worse. Movement is much limited in toes, ankles, knees (fixed in extension in plaster), hips, spine (gradually curving), shoulders (I cannot lift my elbows to shoulder level), elbows (now in acute state of pain and deformity), wrists, and fingers. The disease is now spreading to my neck and jaws, which are gradually becoming stiff.

MY PRESENT CHAIR

My present chair (fig. 1) is of the new tubular steel type, with large pneumatic wheels, at the side and two solid rubber castor wheels, leg-rest extensions, and a handle behind. I have had my handle removed after swiping ornaments from the window-ledges and removing paper from the wall. It stuck out too far.

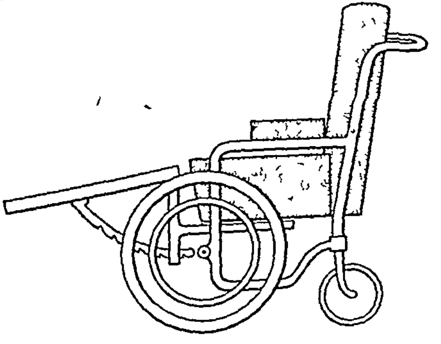


Fig. 1—The present chair, showing straight-back, no head-rest, arm-rests too short, no foot-rests, and no means of adjustment by the patient.

There is nothing about the movable parts of the chair that the patient can adjust. The back is straight but can be put at an angle by sliding the seat forward (only when unoccupied). The back is not high enough

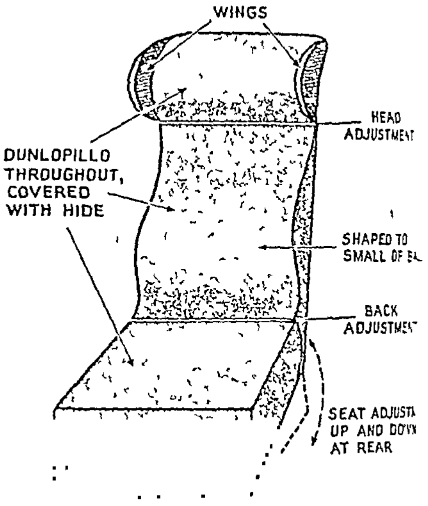

WINGS
HEAD ADJUSTMEN
DUNLOPILLO THROUGHOUT, COVERED WITH HIDE
SHAPED TO SMALL OF B
BACK ADJUSTME
SEAT ADJUSTM UP AND DOW AT REAR

Fig. 2—Suggested seat and back-rest, showing shaped to head-rest, and adjustable seat.

and has no wings to rest against; so the pat no sleep. The leg-rests are adjustable for There are no foot-rests. Consequently, being st the patient gradually slides forward until hi bent and aching and his feet fall forward.

The seat has springs and is padded and cov cheap leather-cloth. You who have first cl try sitting on a similar seat with your legs st front of you (and without getting up to stret selves) from 11 A.M. to 10 P.M., eleven hours for one day only, not three years; then you will have some idea of what one has to go through. This is made *worse for me by the fact that* my elbows are too painful to help in taking the weight while I am trying to find a "softer spot."

The arm-rests are of 'Sorbo' rubber, gratifyingly soft but too high, too narrow, and too short. One sits with shoulders hunched and wrists hanging down over the ends instead of being supported. The distance between the rests is also too little, so the patient is forced *to sit in this* position because there is no room to drop his arms to his side.

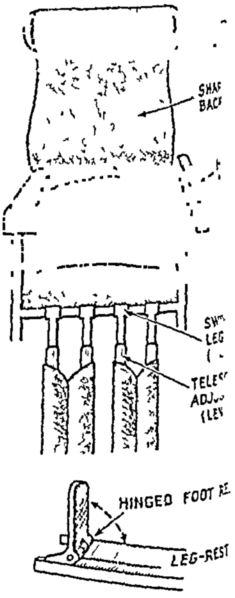


Fig. 3—Suggested hinged adjustable head-rest, foot-rests.

The tyres are pneumatic. When they are blown up hard, the ch delight to handle; but they lose air in two or thr which makes moving hard labour. If one tyre than the other, the chair rocks owing to its fa suspension. New valve rubber has to be fitted inflation, because it sticks and is finally blown off

These are some of the worst faults of my inval and to a person who is bound to use it per year after year, and is always in pain, surely it asking too much to have a little thought put design to enable the disabled to sit in comfort manipulate the adjustments to suit each ache when it occurs.

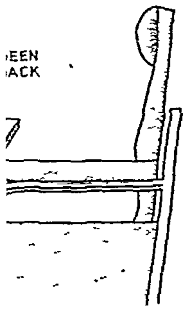
THE IDEAL CHAIR

-given much thought to my chair and its short- describe here what I think would be the ideal alid chair.

–This should be tubular, as at present, but of

—The side wheels should be pneumatic, and :heels small and solid, on castors. The large wheels should be puncture-proof, with ' valves.

ble Parts.—These should be easily worked from by the patient through a control wheel to the ıe chair, between the side-wheel and the frame. ·ol wheel would connect with a light four-way under the seat : (1) to adjust the angle of the (2) to adjust the telescopic leg-rest for length, ow it to fall to a perpendicular position in front of the seat to ease the entrance and exit of the patient; (3) to raise or lower the angle of the seat behind, because legs and seat must be in line; and (4) to adjust the back-rest from straight to reclining, or vice versa. The gear for each operation would be selected by a "gate" change, as on early motor-cars. If the gears were of low ratio, even the weakest patient could operate them. The patient puts the gear lever into he desires, turns the operating hand-wheel *is comfortable, and returns the gear lever* al. The adjustments could be carried out aulics as easily as, if not more easily than, ırs. The system would be the same as the ' jacking system in modern motor-cars. By urning a pointer to the desired operation and by handle the same results would be obtained.



gested adjustable table.

back.—This should be shaped, particularly nall of the back, and should be high enough for ent's head to rest against, and it should have ıgs at the top as an added rest (fig. 2). It should easily adjustable at the base for reclining or ıp. The whole back-rest should be made of illo' and covered with hide.

sts should be padded with dunlopillo covered and should be adjustable for angle and length, ged foot-rests of light alloy. They must also to fall perpendicularly in front of the seat, and wl all over the room when down, hindering both and exit of the chair. The padding of the :d only be from heel to calf, which would leave room for telescoping (fig. 3).

-This should be of dunlopillo covered in hide, tilted forward, and adjustable at the rear for ır lowering to keep the seat in line with the legs mes.

ests should be of square-section dunlopillo covered $3^{1}/_{2}$ in. square and 20–24 in. long, to give ample to the wrists. They should be hinged to open s (fig. 3), to allow the arm to rest by the patient's o be hung on arm-rests all day makes the elbows have removed the screws on my chair and the arm-rests for writing, &c. This gives me of elbow-room.

.—Fig. 4 shows a swivel table, strong enough a typewriter. Care should be taken to keep the low as possible, just clearing the legs ; otherwise ient's arms will ache through trying to hold them ıir.

HOSPITAL ESTIMATES

HOSPITAL authorities have received a Ministry of Health circular (R.H.B. [49] 117) indicating the basis on which their estimates for 1950–51 should be formulated.

MAINTENANCE EXPENDITURE

The Ministry asks that "in framing the estimates of maintenance expenditure for 1950–51 the strictest economy should be exercised and that provision should only be made for new services and the extension of existing services to such extent as the board considers to be urgently necessary and practicable."

In preparing the estimates, the provisions of the Nurses Bill, now before Parliament, are to be disregarded ; if this Bill is enacted, any necessary adjustment will be made when the revised estimates are prepared in the autumn of 1950.

CAPITAL EXPENDITURE

"The Minister" says the circular, "is investigating whether it will be possible, within the financial and productive resources that can be made available to the social services, to make available in the next few financial years a larger share for hospital works." To secure for urgently needed hospital developments "an adequate place" in the allocation of national resources, the Minister must have an outline programme of essential works for three years ahead.

Thus boards are asked to draw up their urgent capital-works programme for 1950–51 as part of an ordered programme extending over the years 1950–51, 1951–52, and 1952–53 : schemes of war-damage repair are to be specially indicated. The outline programmes for 1951–52 and 1952–53 should indicate as nearly as possible the principal development works likely to cost more than £10,000 ; a provisional figure for works under £10,000 should be included. Boards will not be held strictly to their outline programmes, but an early indication of their content, by enabling them to be discussed with the Ministry, will reduce the need for them to be examined when the time comes for formal submission. Boards are advised to draw up their schemes in such a way that if reduction proves necessary when the estimates for 1950–51 are considered, a portion of the work can be moved forward into the following year.

Capital Estimates for 1950–51.—Boards are asked to submit a list of capital works in three parts :

1. Works in progress at March 31, 1950, with expenditure falling in the year 1950–51.
2. Proposed works to be started in 1950–51, with the expenditure falling in that year and that required in later years to complete them.
3. Reserve list of essential works which should be started, if possible, in 1950–51, similarly divided as to expenditure for 1950–51 and later years.

In the case of regional boards, the total for (1) plus (2) should not exceed the total notified in March, 1949, for the year 1949–50 ; the total for (3) should be approximately 50% of the total of (1) and (2).

Boards of governors should submit similar lists, which "should be restricted to really urgent projects." In the case of London undergraduate hospitals and the provincial teaching hospitals, the total for (1) plus (2) should if possible be kept within the range of £50,000 to £100,000, and in the case of the London postgraduate hospitals within the range of £10,000 to £60,000. The total for (3) should normally not exceed one-third of the total for (1) and (2).

Outline Programmes for 1951–52 and 1952–53.—In the case of regional hospital boards the total for 1951–52, including the amounts to be carried forward if all projects for 1950–51 in lists (1), (2), and (3) are put in hand, should not exceed twice the total of (1) and (2); and the total for 1952–53 should not exceed three times that amount.

As regards boards of governors, “ the rate of capital expenditure on teaching hospitals during the past year or so has been proportionately much higher than at other hospitals ” ; and the outline programme should be kept within the same limits as those given for the capital estimates for 1950–51.

In addition, exceptional provision will, if possible, be made for starting one new major hospital project in 1951 and another in 1952. A list of projects is under consideration.

The circular emphasises “ that these figures represent the maximum which the Minister can hope to be allocated. . . . The actual amounts will depend on economic considerations and the needs of other social and industrial services and may well be substantially less.”

TERMS OF SERVICE FOR HOSPITAL STAFFS

The terms and conditions of service for hospital medical and dental staff[1] announced earlier this year have been clarified and slightly amended by the Ministry of Health in the light of questions brought to the Ministry's notice. The following are among the explanations and changes, which are given fully in a circular (R.H.B. [49] 115) to hospital authorities.

Young Consultants.—A doctor appointed as a consultant before the age of 30 should start at a salary of £1400 per annum, rising to £1550 per annum after one year's service, to £1700 per annum after two years' service, and thereafter in accordance with the scale for consultants appointed at age 32 or over. He should *not* remain on a salary of £1400 per annum until he reaches the age of 31. “ In effect, the salary scale for consultants is a continuous scale from a minimum of £1400 per annum to a maximum of £2750.

Senior Hospital Medical and Dental Officers.—The terms of service do not provide for the remuneration of senior hospital medical or dental officers below the age of 32, and it is not intended that anyone below this age shall hold such an appointment. “ Any officers below that age who have not been graded as consultants should therefore be graded as senior registrars, junior hospital medical officers, or general practitioners . . . as appropriate.”

Medical Superintendents and Deputies.—The terms of service laid down that remuneration of this group should be made up as follows :

> “ (1) For that fraction of their time given to clinical work, the same fraction of the whole-time salary of a consultant or senior hospital medical officer according to their grading ; plus
>
> (2) *for that fraction* of their time given to administrative work, the same fraction of the appropriate rate for hospital administrative staff.
>
> Where, however, a whole-time officer is engaged almost wholly in clinical work and gives only a small proportion of time to administrative duties, his appropriate clinical remuneration shall not be affected.”

It is now explained that the reference under (1) to the particular grades of consultant and senior hospital medical officer cannot override grading by a professional review committee ; and if a medical superintendent or deputy has been placed in some other grade the whole-time salary of that grade will be used for the purpose of the calculation under (1). The word “ &c ” should be inserted after “ senior hospital medical officer.”

Part-time Consultant Performing Teaching
The original terms stated :

> “ Consultants performing teaching duties con
> with, or separately from, their clinical wo
> remunerated by hospital boards like other
> (including distinction awards and expenses) in
> *any remuneration they may* receive from the un
> school in recognition of their teaching duties.”

The words “ or separately from ” and “
consultants ” are to be deleted, and the word
clinical work ” are to be inserted after “ remu
“ This expresses without ambiguity the original
Remuneration for teaching duties which are
from clinical work (e.g., lectures, tutorials, &c
responsibility not of the board but of the un
medical school. Such duties (as distinct from
during ward rounds, outpatient clinics, &c.)
considered to be ‘ clinical work ’ under the pa
and should therefore not be taken into accoun
pre-contract assessment . . . of the time required
duties attaching to the post.”

Membership of Medical Defence Societies—
understood that some hospital authorities hav
past required members of their medical staf
members of a medical defence society. The
sees no objection to the continuance of this prac

Medical Superintendents of Mental Inst
According to an earlier ruling (R.H.B. [49] 85),
puting the salary-rates of these officers, “ Boa
ignore any administrative duties of which the
impracticable to relieve a medical superintenden
these duties occupy only a small proportion
officer's time.” Now, however, the Ministry says

> “ Regional hospital boards will, of course, bear
> the importance of reducing to a minimum the t
> by the medical staff to administrative work. B
> should take into account the fact that the p
> medical superintendents in mental hospitals and
> deficiency institutions is affected by the requi
> Statutory Instrument, 1948, no. 419, under w
> medical superintendent's special position as chi
> necessitates his exercising a general control over al
> ments of the mental hospital or mental-deficiency
> tion. Moreover, much of the work which is
> regarded as administrative necessarily falls to the
> superintendent because it is essentially clinical in
> Under this heading would come the statutory
> work and the activities directly connected with the
> ment, training, and occupation of patients, as wel
> general supervision of entertainments and the pro
> amenities. As the medical superintendent is the
> whom any order of detention is addressed, the a
> for the general welfare of patients are his concern
> clinician and as an administrator. But the time
> purely administrative work need not, it is e
> exceed 10% of the time given by a whole-time o
> this may properly be regarded as so small a prop
> the time that there need be no abatement of the
> tion at clinical rates for the whole of his time.”

“ . . . We venerate leaders of the past precisely
they were courageous and farsighted enough to ch
concepts with new ones for a new age. . . . If history
strates anything it is that a frigid reception is us
accorded new social proposals. . . . It is interesting to c
attitudes in the physical and the social sciences. W
pride in the newest and most modern gadget or te
We are disturbed if the doctor evidences the slightest
tion that he is ‘ behind the times,’ since this may mean
suffering. But in social matters we are equally proud of
which were current when diseases were treated by bor
in the head. . . . It is true, as many maintain, that w
show a healthy skepticism toward new propositions
they have been proven. It is interesting to note, h
that those who advocate such experimental testing
concepts frequently do nothing to assist it and in fact
a great deal to prevent it.”—BRUCE STEWART,
Aug. 19, p. 179.

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[1] *Lancet*, 1949, i, 491, 1013 ; *Brit. med. J.* 1949, i, suppl. p. 314.

Education

FIRST MEDICAL EXAMINATION

Its Rôle in Selection of Students

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LONDON

recent discussions on selection of medical omparatively little attention has been paid to medical (or exempting) examination. Pass or this examination obviously *does* select medical and a high failure-rate makes the selection In the London examinations there actually high failure-rate, which is causing concern plicants to medical schools and their teachers. ternal candidates for the London 1st M.B. in July, y 62 (13%) passed. Of 850 candidates taking a Higher School Certificate examination which empt them from 1st M.B. if they so desired *ing physics, chemistry, and either biology or* ad zoology), only 259 (30%) passed at a standard to allow them exemption.*

rength of the rôle of 1st M.B as a selector is ar at University College. London, where the of medical students obtain exemption from the before admission to the college (only between a a quarter are at present obtaining exemption ng the college's intermediate science course). ge's selection procedure is based on consideration pplicant's school record, and his performance at entrance examination and in an interview with ction board. Applicants for a place in the . class may be considered before they have he 1st M.B., and in that case may be offered a bject to their getting 1st M.B. exemption in time. 355 men applied for admission to the 2nd M.B. Among those applicants offered places by the board in the spring, 41 had not then got exemp- n the 1st M.B., and 18 of these subsequently failed n it. It is thus clear that selection by 1st M.B. is lifferently from selection by the board. In spite fact that selection by the board is very intense ection ratio being 1 in 7), more than one-third of didates considered suitable by the selection board ninated by the 1st M.B. A particularly striking discrepancy between the two criteria of selection t of a man whom the interviewing board regarded lectually the most outstanding man interviewed, o scored the third highest mark in the entrance ation, but who failed 1st M.B.

ral questions are raised by this extraordinarily ilure-rate:—Are so many candidates really not nough to pass? Is the syllabus too wide or too t? Is the examining too harsh?—I shall not t to discuss these questions here, but would draw on to two consequences of the failure-rate affect the selection and training of medical ts:

ome of the candidates who fail the 1st M.B. examination o not (for economic or other reasons) attempt it again nd are lost to medicine. Hence the *validity* of this nethod of selecting medical students should be inquired nto—i.e., to what extent performance in this examina- ion is predictive of performance as a doctor.

lany, however, repeat the course and the examination; nd it may be useful to consider the possible effects of his prolonged period of premedical study.

VALIDITY AS A SELECTING AGENT

It will be some years before we have data enabling us to relate the results of the London 1st M.B. to the student's later career. Meanwhile the experience of others is of interest. Gibson (1948) has shown that at Belfast performance in (internal) 1st M.B. examinations in 1942–43 was associated with performance in subsequent examinations: most of those students who completed the 1st M.B. examination at first attempt proceeded directly to qualification, whereas most of those completing the examination piecemeal failed again later in the course. In these conditions, therefore, selection on the basis of 1st M.B. performance would have increased efficiency of selection in the sense of decreasing the average amount of time spent on training a student. (As Gibson points out, it remains to be shown, of course, how performance as a student is correlated with performance as a doctor.) However, these findings cannot be extrapolated to the London candidates, who prepare for the examinations in various ways—in schools, technical colleges, or cram schools, or by private study. It is in fact rather unlikely that performance at these examinations, influenced as it must be by so many factors extraneous to the calibre of the candidate himself, will turn out to be predictive of subsequent performance as a doctor.

PROLONGING THE COURSE

Among the various factors affecting the selection of medical students, the 1st M.B. is peculiar in that it also forms part of the training for medicine. When the failure-rate in the examination is so high, serious repercussions on the functioning of the course in training may be expected.

The average amount of time now spent on getting 1st M.B. exemption is high. Of the 1948 2nd M.B. class at University College, London, 41 students had proceeded directly after School Certificate to attempt the 1st M.B. exemption (i.e., their education had not been interrupted by war service, education abroad, or otherwise): of these 41, 18 had achieved it within two years after School Certificate; 19, having failed at first attempt, had taken three years; and 4 had taken four years.

It is therefore pertinent to ask whether this time is profitably spent—i.e., whether students are getting the best possible training in premedical science. The effectiveness of the biological part of the training has been discussed elsewhere (Abercrombie and Johnson 1945, Bauer and Johnson 1946). The criticisms made apply, I believe, to the courses for London 1st M.B. and Higher School Certificate, and the deficiencies of the courses are likely to be accentuated by repetition. But there is another aspect of the failure-rate to which I want to draw attention here—namely, its psychological effect on students, which may influence their subsequent training.

The value of the premedical training to students must be measured by the extent to which the scientific principles it teaches become incorporated in their later study. Unfortunately, not a few medical graduates look back on their premedical course with impatience and distaste, partly because of its apparent irrelevance; and the hostility of present-day students is sharpened by fear of failure, which threatens their already slender chances of getting accepted by a medical school. Those who fail may repeat the course; many complete the examination piecemeal, spending dreary months on one or two recalcitrant subjects.

These would not seem the best conditions to foster the integration of the "fundamental sciences" with each other, or with the study of medicine. In designing curricula and determining the pass standard of examinations, the possible effects of these on learning capacity should be kept in mind. The deficiencies teachers com-

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grateful to the External Registrar, the Examinations Depart- nt, and the Matriculation and School Examinations partment of the University of London for supplying this ormation.

plain of in their pupils—for instance, inability to observe or to reason—cannot safely be ascribed to stupidity or laziness and therefore dismissed as beyond control. It is more profitable to try to discover and remove those characteristics of the learning situation which strengthen non-rational resistances to the kind of training we think most desirable. Prominent among these is the anxiety which focuses on examinations, and which is naturally intensified if they seem to be unduly difficult.

This is not a plea for "lowering of standards": it is a plea for more searching consideration of the nature of *the standard. We should ask ourselves whether in fact* the best possible yardstick is being used to measure proficiency in premedical science; to what extent the proficiency so measured is predictive of performance in medicine; and to what extent the standard actually influences proficiency in medicine because of its significance in early training.

SUMMARY

The London external 1st M.B. examination i
a stringent selector of medical students. In 1
only 13% of the 485 (external) candidates
examination, and only 30% of the 850 candi
London Higher School Certificate in physics,
and biology (or botany and zoology) passed at a
allowing them exemption from the 1st M.B
desired it. In considering whether this high
is justifiable two points should receive attention.
validity of this form of selection (i.e., to wh
performance in 1st M.B. is predictive of perform
doctor); and secondly, the effect of the high
on the attitude of medical students to the p
sciences.

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Public Health

SCHOOL OUTBREAK OF GASTRO-ENTERITIS ASSOCIATED WITH A PATHOGENIC PARACOLON BACILLUS

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IN September, 1947, an outbreak of gastro-enteritis affecting forty-seven out of three hundred children in an infant and junior school occurred 14–24 hours after a midday school meal. Of these forty-seven children, twenty-eight were acutely ill. They complained of headache and malaise followed by diarrhœa and vomiting some 4–24 hours later; in one patient the onset of diarrhœa was delayed for 48 hours. Pyrexia was present in some cases to 104°F, and persisted for a day or two. Collapse was reported in three patients. Most of the children had recovered after 48 hours of illness although some were unwell for 3–4 days and one child complained of malaise and diarrhœa for a longer period. A small number of cases occurred during the two days following the explosive outbreak, and the fathers of two of the children were reported ill with similar symptoms 2–3 days after the children. Although the onset was less acute in these patients the symptoms persisted slightly longer than in the children.

None of the sixteen members of the school staff or eight members of the kitchen staff, was affected. Within 3 hours of the report of the outbreak the school was visited, members of the staff were questioned, the kitchen was thoroughly inspected, and arrangements were made to visit patients to obtain specimens of fæces and vomit where possible.

INVESTIGATION OF PATIENTS

Twenty-four specimens of fæces and two specimens of vomit were obtained from patients 1–3 days after the outbreak, together with eight specimens of fæces from the kitchen staff. On desoxycholate citrate medium non-lactose-fermenting colonies of a uniform appearance, developing on some plates in almost pure culture, were isolated from fifteen of the fæcal specimens from patients and from one of the kitchen staff; these colonies failed to show slide agglutination with sera from any of the common members of the salmonella and dysentery groups.

Fermentation reactions after 24 hours suggested
organism was probably a paracolon bacillus,
subsequently referred to as paracolon 411
of the biochemical activities will be given in
section.

Coagulase-positive staphylococci were isolated
agar from fourteen specimens of fæces. There was
variety of types among these strains, but those
associated with staphylococcal enterotoxin food
described by Allison (1949) were not found. Sap
organisms only were isolated from the two spec
vomit.

Blood was taken from seven of the cases
days after the onset of symptoms, and the
tested for the presence of *agglutinins to the*
411. As a control twelve Wassermann sera we
at the same time. It will be seen from the
there was no difference in titre between sera from
and from the control group.

EXAMINATION OF SERA FROM PATIENTS AND CO

Agglutinating titre of sera	Paracolon suspensions		
	H		O
	Patients	Control	Patients
Less than 1 : 5 ..	7	Not tested	1
1 : 5–1 : 20 ..	0	Not tested	0
1 : 40–1 : 80 ..	0	2	6

INVESTIGATION OF FOOD

Information available about the foodstuffs
the day preceding the outbreak was as follows:

Pasteurised milk, common to the whole school, was
from the Express Dairy; *milk from the same* co
had been supplied to other schools without ill effect.

Most of the cases (38 out of 47) were in a group
children including infants and junior classes with a
from about 5 to 8 years. Their midday meal on the
question included cold tinned salmon, salad made
lettuce, beetroot, tomato, and cooked carrot, ser
salad cream made freshly from flour, vinegar, and
mashed potatoes, and freshly prepared sponge pud
tinned apricot jam.

In the nursery class of 43 children under 5 yea
there were 2 cases. Their meal consisted of hot fish
from the same batch of salmon mixed with potato
was baked in an oven for about half an hour and wa
to boil. It was served with a white sauce made with
flour. The same salad and salad cream were served
pie, and the same sponge pudding was given for
apricot jam being replaced by tinned orange jelly.

ining junior classes, about 100 children from 8 to 11 ate cheese, potato, and salad, followed by sponge d jam. None of these children was affected in the sive outbreak, but 7 of them were taken ill during ng 2 days.

embers of the school staff ate spaghetti and cheese, and salad cream, bread and margarine, and sponge ith jam, while the 8 members of the kitchen old salmon, salad and salad cream, and sponge ith jam. From these two groups no illness was

e seen that the salad and salad cream, potatoes, e pudding were eaten in common by the whole d that the foodstuff which appeared to be with the majority of cases was the tinned hirty-seven apparently normal one-pound tins used; eleven tins had been emptied into one sh and nineteen *into another*, while salmon o seven tins was used for the fish-pie. Preparahe meal were made at 10.30 A.M. and the dishes mon were refrigerated until 11.45 A.M., when covered and sent to the dining-hall.

vas no history of gastro-enteritis amongst the aff either before or during the outbreak, and ared to be free from cuts, abrasions, or other out the member found to be excreting paracolon e time of the outbreak continued to do so for after which her fæces were negative. The remises were clean and tidy and the washinglure and storage of crockery and utensils was ry.

BACTERIOLOGY

pecimens available for examination were remains almon from one large dish, six sound tins of rom the same batch, and thirty-seven empty ins taken from the dustbin approximately 24 er they had been thrown out.

ony count on the left-over portion of salmon was er g. at 37°C and 380,000 per g. at 22°C. Predominisms from direct and enrichment cultures were tic streptococci, *Staphylococcus albus*, and coliform rganisms of the salmonella and dysentery groups and positive staphylococci were not found. Strains of bacilli were isolated, but their biochemical and l reactions differed from the strain predominant in of most patients.

six unopened tins of salmon, three were incubated or 10 days and three were examined immediately. d enrichment cultures from all tins were sterile.

irty-seven empty tins were rinsed with quarter-Ringer solution and the suspensions were cultured and through liquid selective media for salmonella, , and paracolon bacilli. Organisms of the salmonella ntery groups were not found. Seventy or more of paracolon bacilli were examined, but their bio-and serological reactions differed from those of the ains.

ugh circumstantial evidence suggested that the might be the vehicle of infection there was no logical proof; the second dish of salmon may een infected, but none had been kept for tion.

possible that some other article of foodstuff such gredient of the salad may have been responsible. ne light of subsequent experience it seems likely infecting dose of the paracolon bacillus may be

ACTERIOLOGY OF THE PARACOLON BACILLUS

een strains of the paracolon bacillus were available study, of which seven were isolated from cases hœa in children, two on separate occasions from ber of the kitchen staff, three from two healthy volunteers who had swallowed cultures of the organism, one from a worker accidentally infected in the laboratory, and one from a sporadic case.

The organism was a gram-negative rod. A few motile forms were present, but fully motile cultures were isolated from each strain only after repeated passage through sloppy agar. On desoxycholate-citrate agar the colony was round and shiny, 2–3 mm. in diameter with an entire edge. All strains fermented glucose, maltose, mannitol, sorbitol, arabinose, xylose, and trehalose with the production of acid and gas after 24 hours' incubation, but failed to ferment sucrose, salicin, adonitol, rhamnose, and inositol after 21 days' incubation. All strains fermented lactose with the production of acid only at some time between 4 and 21 (usually 9) days; in addition they fermented dulcitol with the production of acid and gas between 1 and 13 (usually 3) days. Dextrin was fermented with the production of a small amount of acid after 24 hours' incubation. Indole was formed, citrate was not utilised. Urease and hydrogen sulphide were not formed, nor was gelatin liquefied. There was no change in the MacConkey broth after 48 hours' incubation at 44°C.

Serology

Antisera were prepared in rabbits using as inocula a suspension steamed for 2 hours for the production of anti-"O" serum and a suspension of a motile strain in broth killed with 0·3% formalin for the production of anti-"H" serum. It was thought that paracolon 411 might have a surface antigen comparable to those occurring in *Bacterium coli* described by Kauffman (1947). In addition, therefore, a serum was made by the intravenous inoculation of living culture. No evidence was obtained suggesting that these organisms had a surface antigen apart from the somatic antigen, since the titre of the serum made with the living inoculum was 1 : 1280 when tested with either a living or a steamed broth suspension, and absorption of this serum with the living or steamed suspension removed all agglutinins to the living suspension. It was found by direct titration and by agglutinin-absorption tests that all fourteen strains of paracolon 411 had the same somatic and flagellar antigens.

The biochemical reactions of paracolon 411 are very similar to those described for *Bact. coli* var. *acidi-lactici* and *Bact. coli mutabile*. Strains of these organisms were obtained from the National Collection of Type Cultures but were found to differ in their biochemical reactions and to have no serological relation to paracolon 411. All strains of the Arizona group of paracolon bacteria described by Edwards et al. (1947) were found to have no serological relation to paracolon 411. Paracolon organism type 29911 described by Stuart et al. (1946) was not agglutinated by the paracolon serum, but a serum made with type 29911, obtained from Dr. Wheeler, agglutinated the paracolon to 10% of the homologous titre.

Pathogenicity

Two drops of a young broth-culture of paracolon 411 were mixed with 5–6 ml. of quarter-strength Ringer solution. This mixture was introduced into the stomach of a monkey by means of a catheter. The monkey remained in good health with no signs of gastro-enteritis though the organism was recovered from the fæces over a period of several days.

Two human volunteers offered to test the pathogenicity of paracolon 411. Four drops of a 4-hour broth-culture of the organism were mixed with a portion of sterile tinned salmon. The portion was divided at once into two parts, each volunteer eating one.

About 22 hours after the ingestion of the infected salmon the first volunteer complained of slight abdominal discomfort. This was followed 2–3 hours later by shivering, pains in the limbs, and headache. The temperature at this time was 101°F, falling to normal within the following 48 hours. Nausea and diarrhœa started about 12 hours later. Diarrhœa was accompanied by upper abdominal pain which continued for a few days, particularly after the consumption of food. In the acute stage of the disease paracolon 411 was present in the fæces in almost pure culture. Three days later it was found in small numbers but was not isolated after 12 days when the patient had recovered.

The second volunteer began to feel unwell 3 days after eating the infected salmon. He complained of abdominal discomfort and lack of appetite for a few days. Paracolon 411 was isolated from specimens of fæces.

Specimens of blood taken before the ingestion of paracolon 411 and 4 weeks after, gave the following serological results when tested with a suspension of paracolon 411 :

Paracolon 411 suspension	1		2	
	Before	After	Before	After
H	<1 : 10	<1 : 10	<1 : 10	<1 : 10
O	<1 : 10	1 : 40	1 : 10	1 : 20

There is a definite rise in titre in the serum from the first volunteer though little change in the serum from the second.

While working with the paracolon a member of the laboratory staff became infected. The incubation period was about 48 hours and the clinical picture similar to that of the first volunteer. This patient's serum taken on the 5th day of disease failed to agglutinate the paracolon " O " suspension at a dilution of 1 : 10, but serum taken on the 20th day after onset agglutinated the suspension to a titre of 1 : 80.

DISCUSSION

The rôle of the paracolon group of organisms in diarrhœal conditions is very difficult to assess, for they are commonly found in specimens of fæces during the recovery period in patients who have been shown to be suffering from salmonella or dysentery infections.

Rhodes (1942) described a small outbreak of diarrhœa in a mental hospital associated with a paracolon bacillus differing from the present one in some of its biochemical reactions.

In the present investigation evidence pointed to paracolon 411 being the cause of the outbreak : cultures from fæces in the acute phase of the disease showed it in almost pure culture ; it disappeared from the fæces with the recovery of the patient ; and it was isolated from the majority of specimens of fæces received during the acute stage of the disease. Careful investigation of some of the articles of food left over from the suspected meal failed to reveal paracolon 411. Other foods—notably fresh salad, salad cream, fish pie, and one dish of cold salmon—were not investigated, because none remained, and it is possible that one or more of these foods may have been the vehicle of infection. It seems unlikely that the paracolon was present as a contaminant due to faulty processing in an unopened tin of salmon : it is far more likely that one or other of the foodstuffs eaten at the meal was infected accidentally. But no data as to the source of the infecting organism were obtained ; for the food-handler found to be excreting the organism over a period of some weeks may herself have been infected in the kitchen.

The infecting dose of paracolon 411 may be assumed to be small, since the period between the preparation and consumption of the foods was about $1^1/_2$ hours which would not allow time for a large increase in the number of bacteria present.

Proof of pathogenicity was provided by two human volunteers and an accidental case of laboratory infection. The two human volunteers were infected by the consumption of probably not more than 500,0 —a small infecting dose when compared with t of 2000–4000 million *Salmonella typhi-mur* Hormaeche et al. (1936) found necessary for the of human volunteers. Additional evidence of inf a significant rise in agglutinin titres in the se of the patients during convalescence.

It may be mentioned that one of us (J. T.) thirteen strains of a paracolon bacillus isolated outbreak of food-poisoning in a prisoner-of-war Leicestershire and two sporadic cases of gastro —one in Hull and the other in Oxford. The reactions of these strains were the same as paracolon 411 described except that all thirte small amount of acid, or acid and gas, in 1–7 days, and acid and gas in MacConkey 48 hours' incubation at 44°C. Ten of the were firmly non-motile, but after many became motile. A serum was made using one of reciprocal absorption tests showed that these were serologically identical with paracolon 411.

SUMMARY

In an outbreak of food-poisoning among children, a serologically homogeneous strain of colon bacillus was isolated from the ma patients.

This organism produced illness in two huma teers, and also by an accidental laboratory infe

The infecting organism was not found in foods examined.

From a knowledge of the methods of the pr of the food in this outbreak, and from the organisms causing infection in the two volu appears that comparatively small numbers of th of paracolon bacillus can produce illness.

We wish to thank Dr. W. C. Harvey, medical officer for making arrangements for the visiting of pa promptly after the onset of symptoms. The collection specimens and epidemiological data at an early sta possible to obtain a clear picture of the outbreak wish to thank Dr. H. J. Harris for his valuable a and Dr. R. Pilsworth for sending strains from the o Leicestershire. The strain has been deposited in the collection of Type Cultures, and bears the number

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Poliomyelitis

In the week ended Sept. 3 notifications in E and Wales were : poliomyelitis 289 (258), polioe litis 19 (22). Figures for the previous week are in *parentheses*.

The following counties reported multiple London 43 (34), Berkshire 5 (3), Chester 3 (0), C 5 (5), Cumberland 1 (1), Derby 2 (2), Devon Dorset 2 (2), Durham 8 (3), Essex 21 (13), Gl 13 (14), Hertford 3 (6), Huntingdon 2 (0), Kent Lancaster 28 (33), Leicester 11 (1), Lincs, Kesten- Lincs, Lindsey 5 (3), Middlesex 18 (17), North 3 (4), Northumberland 10 (6), Nottingham Somerset 9 (6), Southampton 10 (16), Stafford Suffolk, East 2 (1), Surrey 7 (5), Sussex, Ea Sussex, West 3 (2), Warwick 8 (7), Wiltshire Worcester 4 (0), Yorks, West Riding 37 (33), Gla- 5 (1).

The fluctuation during the past three week thought to have any special significance ; and th increase in the weekly total should not be tak omen of further rises of considerable magnitude

Disabilities

CHRONIC MYELOID LEUKÆMIA

I was 51. Life has always been a mad rush
il these last few years have slowed me down.
onder whether the violent sport I undertook
th was detrimental to my health. I have had
, too. even though I prided myself on doing
ly and in the best manner. I pulled my side
mping, I remember, when gaining the school
hip—quite an achievement in those days,
t lady-like. In fact, now that I think about it,
d trouble with my side for many years. For
lying in bed on my left side has for a long
very uncomfortable.

1946–47, when I was 48–49, I began to feel
d the pain in my side was getting naggingly
ly doctor could find nothing wrong with me
sted my age and fibrositis as the cause of my
s. My weight was noticeably diminishing and
became anxious. All this time I carried on as
ting up at 7.15 A.M. and dragging myself about
hold duties, though I often had to stop in the
a job, flop on my bed, and go fast asleep for short
most unusual for me. I lost three stone in a year.
tor ordered me extra milk and took a sugar
ere was a small amount present, so I went to
or a full test. I also had my chest examined
s. These proved to be all clear and the clinic
ympathetically told me I was suffering from
exhaustion due to the menopause. The meno-
y the way, I got over quite without trouble.
while on holiday with my family, which I spent
out, that I discovered the lump in my side.
as I returned home my doctor examined me and
t it was my spleen and I would have to have
sts. I went to a special clinic, where a blood-
as taken and I underwent the most thorough
tion I have yet experienced. I was told I was
from myeloid leukæmia and was advised to
ections of nitrogen mustard as soon as possible.
arned that these would be unpleasant and make
ill. They did—but I know I would not be alive
ut for them. I was in such a low state that
ed a hospital for treatment and observation.
ood tests were done daily and I began to take
sulphate and ascorbic acid, and I had the injec-
ery four days. After five injections my white-cell
ropped from 552,000 to 21,200. After this I had
r ten weeks. Then I started the injections again,
es fortnightly, sometimes monthly.

injection was usually given about 3 or 4 P.M.
that I had two hours' grace before the sickness
My aim was to go to bed and try to sleep, and for
took a sedative. I found a mild one (pheno-
ne) preferable to hyoscine as I felt more normal
rds. I was sick for four hours, at 15-minute
ls, the actual vomiting lasting a few minutes each
The retching and straining distressed me very much
t me extremely exhausted, but at the end of the
urs I would fall asleep. It helped greatly to have
by me to cheer myself up with " Half way now,"
nly another hour now."

t day I found it was best to stay in bed until mid-
g. I would take breakfast and feel cheered to
e worst over. I felt quite well on getting up—
shaken perhaps, since even an ordinary bilious
has always proved a major calamity for me.
I had been up a short while I would begin to feel
shaky and slightly nauseated. To get up very
y from a chair would produce a feeling of being
d-out, and it took three days before I felt better.
ps a younger person would have more resistance.

I dreaded the injections terribly, yet I would go of my own accord before my next appointment and ask for one, if I thought my count was getting high, since they had such marvellous and immediate results. Incidentally, I can tell what my count is doing from the size of my spleen. It disappears at about 16,000–18,000 and I can make a good guess up to 50,000 or 60,000: over that I just know it is very high.

After having injections at various intervals for about four months I began to put on weight, and after six months nobody would have guessed there was anything wrong with me, though I think my weight fluctuates a little. I carried on with this treatment, visiting my specialist for spleen examinations and blood-counts, with injections accordingly, for about a year, when to my joy one day I was told a new treatment was to be tried, consisting of a similar drug in tablet form.*

* * *

Now, the injections definitely haunted me. Frankly, I was afraid of them, though I knew they were keeping me alive. I sometimes wondered how I could go on living if I had to have them. They say that nausea can cure a drunk, the feeling is so awful; so it will be understood how one feels about the sickness. My family had to be considerate to me during these bouts, and it worried me to be a liability to them, though I cannot say enough for the wonderful patience, understanding, and moral support I received from my husband even when I was told nothing was wrong with me. This is extremely important to a woman. The doctors can do much, but unless the patient's morale is high they must be handicapped. So the injections were a shadow, even though I kept congratulating myself on being able to have any treatment at all.

At first I was dubious about the pills. I wondered whether they would produce the same awful effects. but so far I have been fortunate. Four pills affect the bladder sufficiently to be slightly uncomfortable. Three pills let me know they are working and cut my count by half in two weeks. I notice they take about 8–10 days to start working. This is a pity sometimes, as the count in the meantime is soaring. My doctor is now aiming to find how many pills are needed to keep me on an even keel. At the moment I am on $1^1/_2$ daily. My red cells and hæmoglobin vary, I suppose according to the energy I expend, and mental worry I think also affects them. 'Metatone' cheers me up wonderfully, and a glass of burgundy—I like to think—is excellent. But the pill treatment is so mild that I do not consider myself an invalid any longer. Indeed, most of the time I completely forget my complaint. I can walk to and from the village—2 miles altogether—when I am in good form, which is quite often, and arrive home fresh and ready to prepare whatever meal is due. I go and spend a week in London and do a day's shopping in town. I enjoy life, though perhaps I am more sedate than I used to be. I live quietly, which is no punishment, and rest if I feel I need it. The only alteration in my mode of living is that I have given up cycling—loading my bike up with shopping parcels and string bags full of vegetables is too much for me. I am poor at standing, so I just don't stand. I find a seat anywhere. I get weary sometimes—perhaps if my count has been high; but every mother seems to be weary these days.

My doctor has always treated me frankly, teaching me about my malady and giving me credit for a little intelligence, and this has encouraged me to coöperate.

If the injections can be avoided, leukæmia is not a bad disease really—no pain, one can eat what one likes, and do anything one feels up to, and one has a legitimate excuse for being lazy. I bear this in mind and am thankful.

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* We understand that results of clinical trials with this drug have not yet been published, and that other patients have seldom had such benefit from it as our contributor records.—ED. L.

In England Now

A Running Commentary by Peripatetic Correspondents

MY holiday this summer presented me with a valuable addition to my therapeutic armamentarium. The Western Highlands had drawn me for the fishing, but rivers were low and water and skies clear. Even the sea lochs failed, for as the local fisherman had it "the fish had a' stravaiged awa on their ain mysteerious occasions." Not being fit enough to climb mountains I loafed around—a thing my temperament allows only for a short period. One evening a chance remark led to an impromptu exhibition of water-colour sketches in the hotel lounge. The artists were all amateurs and enthusiasts. Four members of the Ayrshire Sketching Club had come north to paint. The other two exhibitors, a pharmacist and a physician from London, were sketching as an incidental to the holiday. The pictures took my eye at once. There were about 40 water-colours, all attractive, some strikingly beautiful. The number impressed me, for it was a surprise that all these fine sketches had been done in less than ten days.

"I paint for pleasure of painting," the physician admitted. "My efforts will never be hung even in the decent privacy of my dressing-room. They will sleep in a portfolio and I may hardly look at them again—except for self-discipline," he added ruefully. He waved aside my complimentary objections. "No," he went on, "I know my own limitations. But I like painting and there is no other occupation I know which is so rewarding to the incompetent. But it has done more than give me pleasure, for it prevented an incipient nervous breakdown a couple of years ago. A colleague prescribed paint brushes for me and I've blessed him many times since." He eyed me with that unmistakable look of clinical appraisal. "And if I may suggest it, my friend, it is a prescription you could profitably take yourself. If you like I will lend you paints and things tomorrow."

Next day my colleague reminded me of Mr. Churchill's advice to be bold and resolute, and then left me to it. My previous experience of drawing was meagre—though I recall that Sharpey-Schafer once almost praised my histology notebook. But I took a big wet brush and slapped the paper full in the face. For a moment I felt I had been too temerarious, but anxiety disappeared with every daub, and soon I was slashing on rich, rewarding colour with gusto. For the rest of the holiday I did not repine over the low water in the river. Since I returned to my practice I have gone on painting and I am calmer and happier than I have been for years, because of the relaxation given by this beautiful hobby. And it is beautiful even though perhaps all my paintings are not. Anyway I have put several patients on it and they have all benefited. This therapy has the advantage of being quite safe, and it appears virtually impossible to overdose.

* * *

We have all read about the surgeon who admits his dying fiancée to the casualty department or who finds himself amputating his wife's leg. But have you tried being on duty for yourself? In my small hospital we take some pride in having maintained a 24-hour X-ray service (the radiographer and myself) for over twenty years. It was, of course, during my spell of duty that I fell heavily from a stage and assessed the damage as a badly bruised right hip, an almost useless right arm with no power of adduction, and a minimum certainty of a subcoracoid dislocation of the head of the right humerus. It seemed all important to get a skiagram before the rapidly increasing pain from arterial and muscle spasm produced complete incapacity. My new car, with its gear-change on the steering column, requires at least some power in one's right hand, but with the help of a kind friend from the audience I managed to park the car at the hospital and hobble along to the X-ray department, only to find that increasing pain and faintness made any practical movements impossible. Night sister arrived at once and made things harder still. Though hitherto our slightest word had been law, now all was changed. We were now a patient, and patients didn't treat themselves in a properly run hospital. She flew to telephone my partner and the rad Meanwhile, feeling certain that the latter w unobtainable and that the sands of time wer out as the hand became more ischæmic, I m persuade the young and kindly nurse who was me to pull over and switch on a portable di while I struggled into a half-lying position on X-ray table. Night sister soon returned to matron was dressing. With reluctant appre the circumstances, sister helped to push a cas the damaged shoulder, and the two girls betw as if they were handling red hot devils, aligned and set the time switch to my mumbled direct nose in pillow.

I was just able to stagger into the change the film left-handed from the cassette to and into the waiting developing tank. Then mental seconds for development time—this is of a distraction against pain—I made a final dumped the film into hypo. Then I fell almost arms of my partner and very gratefully left th conduct of affairs to him. Matron had now keep order and tell me that one of my surgical *was on his way. Meanwhile she* supported paralysed arm while my partner lifted out film and found a viewing screen within my field I had underestimated development time wit developer—it was now 11 P.M.—but the film clear subcoracoid dislocation and, more no obvious fracture. Then my fellow surgeon to make a careful examination, characteristically to see the film until he had made a clinical After that, along came an injection of anæsthetic, and expert reduction.

One has to be a patient oneself to realise the value of confidence in one's surgeon and and how ghastly it would be to have to sub operation without that confidence. After a very able night in a private ward I won two pitched one with a young nurse determined to give me a bath (perhaps because I had taken out her appe months before) and the other with the entire staff, now abetted by my dear wife, who idea of dressing and going home. Two day except for a sling, there was surprisingly little d True, I could only play the church organ left and it was not very kind of the congregation to they didn't notice any difference.

* * *

Having been used to a teeming outpatient in a Chinese city, doing a locum tenens in th country" is a bit of a change. There it was m than not: "What kind of a pain?" "Where pain start?" "Was it relieved by meals?" all ing to the Teachers. Here it is: "What colour medicine?" "Did you take it twice or three day?" "Did it make you sleepy?" This after a search through the records, ending in a ring to the local chemist for the magic mixture which Mrs. X will not be able to endure day.

There the patient could be seen returning hom *many miles distant), walking carefully between* th gingerly holding a three-ounce bottle suspended neck with string. Here nothing less than a ounce bottle will do, even for the patient in th street.

Here, given the immense advantage of being address the patient in one's native tongue, I the temerity one day to take the bull by th and suggest that that pain of indefinite charac obvious psychogenic origin was not due to any able disorder of the stomach but to an anxious of the mind—following the methods of explanati reassurance advocated by the Teachers when by an anxiety state. By the end of the day, b after repeated visits and angry parleys with the vexed friends and relations, I heartily wished back in China with the limitations of that tongue to restrain any sorties into the too too fields of psychological medicine, as the well-love rhei co. was once more offered to appease the angered psyche and pander to his *aerophagic* hab

Letters to the Editor

MPLOYMENT OF ELDERLY PERSONS

ur leading article last week draws attention
rtant matter in which the medical profession
an interest. The advantages to a person
ached the age of retirement of finding useful
it are well known. It is not only a
f keeping mind and body active; the know-
he is still of use in the world helps to keep
y. While, however, everybody is agreed that
should be encouraged to continue working
clear how this may best be done.

ibly it is advisable for a man to remain in the
ronment, doing much the same kind of work
if full use is to be made of his experience and
Indeed, this will usually be necessary because
culty for an old person of finding new employ-
illed medical assessment of his capabilities will
d to include both the type of work and the
.e., full or part time); but certain difficulties
or example, should there be a medical
on at the age of, say, 65 and another at 70?
aminations give such a feeling of insecurity
eems well to have a longer period between

from medical questions, how is the elderly
be fitted in without injustice to his juniors?
ment services, for instance, it will be necessary
ock promotion, and presumably the Treasury
to be satisfied that the continued employment
members of the staff involves no loss to the
Possibly an answer may be to employ them
at a reduced salary on some subject in which
e become expert and may perhaps be able to
ers.

l workers, especially those doing heavy work,
be so easy to place. The number of "light"
chmen, storekeepers, &c.) in a factory is limited,
n may not be physically capable of continuing
er work. Perhaps here too something can be
the way of shorter hours and the teaching of
We need to know much more about conditions
nt kinds of employment and about the varying
for work in people reaching retiring age;
the knowledge that they may extend their
days has a beneficial effect mentally and
y; the period during which pensioners can
be expected to make a useful contribution
work of the world; and, indeed, whether
a general desire among the elderly to go on

roblem is complicated, but as your leading
ows, it is important, and the difficulties cannot
d the wit of man to solve. The collection and
tion of facts needs time, skill, and money;
eems desirable that somebody with experience
r inquiries should collect evidence on which
suggestions for the best means of keeping the
n employment. The Nuffield Foundation already
od deal on its hands, but it is the kind of organisa-
t would do the work well; and no doubt general
mers, district medical officers of health, and
officers of factories would be invaluable for
g information about individuals and industries
areas.

ly others of your readers can think of better
ons than this; but something should be done
, because the problem grows yearly and a
ory solution is overdue.

y of Health, London, S.W.1. E. L. STURDEE.

PAYMENT FOR INVOLUNTARY RESIDENCE IN HOSPITAL

SIR,—The salaries of hospital doctors are now assessed to exclude residence; and suitable sums for residence are to be deducted where necessary.

If a doctor is fully resident he uses the hospital as his hotel and a full deduction seems appropriate. But many registrars are resident only when on duty. Residence then becomes an imposition, of value to the employer, and the doctor ought really to be paid extra for it. The L.C.C. recognised this principle in allowing assistant medical officers to be non-resident and granting full non-resident allowance, although the doctor was usually expected to live in when on duty.

Some management committees appear to be intending to charge these unfortunate residents-on-duty for part or even full residence costs. Some of these men are quite senior and their residence is of very obvious advantage to their hospitals. All have their home expenses and all must pay income-tax on their whole salary, including the sum deducted at source for residence. It is much to be hoped that medical members of management committees will resist any attempts to deduct from an employee's salary in respect of his overtime.

London, E.11. J. BARNARD.

SODIUM β-GLYCEROPHOSPHATE IN OBSTETRICS

SIR,—Since 1946 many papers have appeared in the Spanish and South American journals extolling the virtues of sodium β-glycerophosphate in the treatment of abortion and disorders of uterine activity. Velazquez and his colleagues[1] and Cativiela[2] have examined its pharmacological properties and regard it as a non-toxic and effective antispasmodic of smooth muscle. There have been very favourable reports of its effect in threatened abortion, hypertonia of the uterus, and persistent afterpains.[2 3]

In view of this, the drug was given a short trial here. Some difficulty was experienced in preparing the solution for intravenous injection, a 50% solution having been recommended but no details for preparation given. A 50% solution of sodium β-glycerophosphate *B.P.C.* was prepared in sterile water and resterilised in 10 ml. ampoules at 115°C for 30 minutes.

Altogether twenty cases of threatened abortion were treated by rest in bed and intravenous injection of this solution. The dosage varied considerably—from 10 ml. per day (as recommended) to 10 ml. whenever uterine contractions were apparent; 16 cases received considerably more of the substance than has been reported in the original papers. In all the cases the cervix was closed at the commencement of therapy, and every case aborted within five days; no toxic effects were noted. In view of these poor results, no extended trial has been made of its effect on the full-term uterus. However, in 2 cases injections of 10 ml. of the solution were given during apparently normal first stages of labour when contractions were well established and the cervix four-fingers dilated; no diminution in the frequency and strength of the contractions was noted and further doses produced no effect. In one case, 30 ml. was given well on in the second stage; no effect whatsoever was observed.

In our hands, therefore, the substance appears to be ineffective in diminishing uterine tone. None of the patients gave any history suggestive of vitamin-B deficiency, the commonest cause of failure reported in

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1. Velazquez, B. L., Garcia de Jalon, P., Perez Carcinero, R. *Obstet. ginec. latino-amer.* 1946, 4, 827.
2. Cativiela, M. R. *Farmacoterap. actual*, 1946, 3, 474; *Ibid*, 1947, 4, 26.
3. Llusia, J. B., Funcasta, C. G. *Obstet. ginec. latino-amer.* 1946, 4, 896. Santamaria, L. T. *Hisp. Med.* 1946, 3, 481.

the original papers. This *B.P.C.* grade of sodium β-glycerophosphate does contain a little of the α form, but Velazquez states that this too is effective. The possibility that the substance decomposes on autoclaving has also been investigated, but it appears to be stable.

The unavoidable conclusion is, therefore, that sodium β-glycerophosphate is of no use in the treatment of abortion and has no effect on the contracting full-term uterus.

St. Mary's Hospitals for Women and Children, Manchester. D. C. A. BEVIS
Senior Registrar.

PERFORATION OF INTESTINE BY FISH-BONE

SIR,—Mr. Travers's article last week calls to my mind a similar case operated on by me.

For six weeks before consulting me in December, 1944, the patient, a stout elderly man, had persistent pain in the abdomen followed by a swelling immediately to the right of the umbilicus. This swelling had diminished and then reappeared. He had a very deep umbilicus, and I concluded that the swelling was due to cellulitis with suppuration in an hour-glass umbilicus.

Appropriate treatment was ordered and I did not see him again until June, 1945, when there was an obvious abscess in the same situation. Immediately before incising this, I ventured a guess that a foreign body might be present. A small amount of pus was evacuated, and, on exploring the cavity with a finger, the foreign body, which was a flat and springy fish-bone $^1/_8$ in. wide and 1 in. long, was removed. The wound healed normally.

Obviously this bone must have perforated the small intestine, causing the abdominal pain of which the patient complained, and had managed to perforate the peritoneum and fasciæ. The patient had no recollection of having swallowed this bone.

Plymouth. EDRIC WILSON.

CONCENTRATION OF DIPHTHERIA ANTITOXIN IN CORD BLOOD

SIR,—I was interested in the article by Miss Barr, Mr. Glenny, and Dr. Randall in your issue of Aug. 20.

For reasons pointed out elsewhere[1] one may assume that diphtheria antitoxin is a univalent antibody, and that therefore its concentration in the cord serum and the maternal serum should be equal. In fact, the data given by Miss Barr and her colleagues in table II fulfil this expectation. In their conclusion, however, the authors state: "The antitoxin content of cord blood was very appreciably higher than that of antenatal samples of the mother's blood taken during labour."

The reason for the discrepancy between the conclusion and the actual findings can be found in the body of the article, where the authors claim that the method of titrating antitoxin used by them has an error of less than 10%. Actually, serological titrations ordinarily have a minimum error of about 100%, and only by doing multiple titrations and averaging the results can the error be reduced to 50%. If the authors' conclusions were correct, then it should be possible to take the same samples blind—that is, with no indication of which is the cord blood and which is the maternal blood —and by repeating the titrations to identify the samples correctly. Had this experiment been tried by the authors they would have found that they could not really differentiate the cord serum from the maternal serum, showing that the titres of antitoxin in the cord serum and the maternal serum are not significantly different. In five cases where the antitoxin titrations were repeated on the baby's serum only 1–5 days after birth, lower titres were obtained which agreed more closely with the maternal titres, demonstrating the existence of a relatively large experimental error.

New York. A. S. WIENER.

WHY NOT GENERAL PRACTICE

SIR,—Your admirable leader of Aug. 27 ex
thoughts of many, and calls attention to matte
importance for the future development of m
this country.

The prestige of the profession will depend
on the general practitioner and not on the
To debase him is to debase the medical profes
Health today is an urgent social problem, and
tice of medicine calls for more than technical
The hospitals in general must remain the
for salvage and research. They accumulate th
the rare, and the little understood cases, and
by specialists who have never been in gener
and too frequently have little understandin
problems. They tacitly assume that the
become specialists and the rest go into general
and their teaching often reflects this attitud
primarily for this reason that the average stud
hospital woefully ill-prepared for general pract

To restore the balance and raise the presti
general practitioner you suggest the estab
chairs of general practice. Surely the need
met if before specialist status were granted, par
for any post entailing teaching, a certain lengt
had to be spent in general practice. Similarly,
entering general practice the new graduate sh
several hospital posts. In this way there would
balance in teaching and more unity in the p
The specialists would bring to their posts a som
ledge of social problems and human under
gained from general practice, and through thei
ship raise the vocation of medicine to new h
service to humanity.

The present tendency to which the ill-prepar
mentation of the National Health Service h
impetus, is for the general practitioner to be
by a mass of people with trivial or imaginary
many of them demanding specialist opinion.
facilities for handling this mass, the inevitable
that a large number of ill-assorted and unsort
reach the specialist clinics and hospitals. T
waiting-list for appointments increases and the s
in turn are deprived of the opportunity for effici
by overwhelming numbers.

The only hope of improvement is in the
health centres where the general practitioner m
facilities for examination and diagnosis and c
for thorough work. Most of these centres will, f
years to come, have to be improvised, but tha
have the merit of allowing the best type to be
out in practice. These centres would, moreover,
from which future specialists might, by their
set standards for general medicine and restore th
of the medical profession which present te
endanger.

Farnham Royal, Bucks. M. E. M. HER

SIR,—The proposal to establish a College of
of General Practice[1] revealed not only dissati
with graduate and postgraduate medical educat
also some confusion about the practice of medic

Having spent many years in general practice,
postgraduate education, I want to suggest that
mission of inquiry should be appointed to consid
problems. The following questions should be
"What is general practice, and what should
How and why does it differ from specialist p
How should these two branches of medicine be
to each other? What, if any, special skills
require? Can those skills be taught? If so, b
whom, and at what stage in the career of the

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[1] Wiener, A. S. *Ann. Allergy*, 1948, 6, 293.

[1] *Lancet*, 1949, i, 372, 415, 458.

ers have been obtained to these questions,
d postgraduate education cannot be planned
l.
iminary to such an inquiry, I offer the following
discussion :

l practice is the practice of the entire corpus of
) within a special (domiciliary) environment.
rd with a particular conception of health and
(c) in relation to the individual patient, as a person.
ot and cannot be a "specialist," except in the
relatively unimportant sense that he works in a
environment. Even in this restricted sense,
e G.P. is not a "specialist," since the patient
the consequences of his occupational and social
t, even while he is in his home. The home is not
vironment.
lism (properly so called) consists in the practice
(*a*) within a special environment (e.g., tropical
r (*b*) in respect of an organ, system, or region of
r of mind, that can be conveniently isolated for
ecialism is really a matter of medical convenience,
be regarded as such.
cialist, as such, can instruct a G.P. only in those
special subject that the G.P. needs to embody
corpus of his general knowledge. The specialist,
nnot teach the general doctor what (as a specialist)
practise.
ine of demarcation between special and general
ill be found to lie in the differing attitudes towards
l disease that characterise these two groups of
actitioners. To define and recognise this difference
e first step towards the reorganisation of medical

two different attitudes manifest themselves in
nd treatment. Thus the specialist-scientific diag-
sentially a nominal diagnosis—a classification. It
e identification of the pattern of the disease or
he integral or comprehensive diagnosis, on the
l, aims at making a causal or ætiological diagnosis.
t majority of actual instances of illness which the
actitioner sees, a nominal diagnosis is impossible.
ttern of disease nor any syndrome has yet estab-
f. Indeed, the appearance of such a pattern means
ractitioner has failed to achieve his chief object,
to prevent syndromes and to establish positive
o do this he must make what may be called an
pre-diagnosis, and to make it before illness becomes

general practitioner knows that states of soul,
society, economic states, and states of will are
causes alike of short-term illness and of long-term,
syndromes. He knows that imponderables, such
and spirit, are ætiological factors. He is aware
iagnosis must embrace the whole man and that his
must deal with the imponderable as well as the
e causes of ill health. Indeed, if he is wise, the
actitioner seldom thinks in terms of either cure or
nt. He thinks always in terms of health, and of
, moreover, of the whole man—that is of the person
o-religious setting.

ld be wrong to suppose that integral medicine
ht to be, practised only by general practitioners.
ecialists practise it whenever they forget that
specialists and become human ; and all general
ts practise it. Nevertheless general practice is
erent from specialist medicine. It is different
ecause it is concerned essentially with the pre-
of the patterns of disease and with hygiene.
sent general practice is not being well taught
graduates or undergraduates—at least, as a
discipline. Its condition calls, I believe, for a
on of inquiry.

er. HOWARD E. COLLIER.

The true answer to the above question can be
Dr. D. R. Goodfellow's "Reflections on leaving
Practice," published in Bulletin no. 5 of the
ip for Freedom in Medicine. I shall be happy
n a copy to anyone interested.

On reading this very human document two thoughts struck me forcibly. Firstly, unlike so many of us, the writer actually welcomed the National Health scheme and determined to try to make it a success. Secondly, the writer is so obviously sincere. It is a tale of disillusion and frustration, and should be read by everyone before others can make the same mistake. I am glad to see that Dr. Goodfellow stresses the impossibility of treating anything like 4000 patients, and of course it is nonsense for men to say that they can effectually do so. They may be able to "manage" them, with the help of dispensers, but this is not real doctoring nor medicine. In over 25 years of general practice I saw how big panel practices were run or managed ; the choice of word is immaterial.

I can reassure Dr. Goodfellow that there is nothing cowardly in resigning from impossible conditions of service. It is the advice any doctor who can think clearly will give his own son today. Undoubtedly it will further Mr. Aneurin Bevan's purpose in levelling down the profession, but the time will come, in general practice at any rate, when most men worthy of the name of doctor will be *outside* his health service of today.

No ; the word cowardly might be more fittingly applied to those who led the profession into such a mess, and this does not absolve the highest, nor the lowest. Rather I congratulate Dr. Goodfellow in his courage, and I hope everyone will read his reflections, and we may then be spared such effusions as "the sympathetic attitude of the Minister of Health."

Hampstead, London, N.W.3. H. V. DEAKIN.

NATIONAL COAL BOARD

SIR,—In his letter last week Dr. Capel rightly draws attention to the notable developments in the field of health brought about by the National Coal Board. Nevertheless, he is hardly fair to private enterprise in saying that the first seeds of a medical service in the coalmining industry were sown by the Ministry of Fuel and Power. Progressive mine-owners established medical treatment centres at their collieries more than twenty years ago.

Codnor, Derbyshire G. F. KEATINGE.

CANICOLA FEVER

SIR,—It has been suggested to me that case 4 recorded by Captain Watts and myself in our paper of May 28 was one not of canicola fever but of leptospirosis icterohæmorrhagiæ. The reasons for this suggestion were : (1) that jaundice and pneumonia are unusual in canicola fever, and (2) that the symptoms in the patient's two dogs were unusual for a leptospiral infection.

The full serological findings in this case (omitted from our abbreviated report) were :

Day of disease	*L. canicola*	*L. icterohæmorrhagiæ*
7	+ at 1/100	+ at 1/10
	± at 1/3000	± at 1/30
	± at 1/1000	
16	− at 1/1000	− at 1/1000
31	+ at 1/1000	− at 1/100
	trace at 1/3000	trace at 1/300
79	+ at 1/1000	+ at 1/10
		trace at 1/30
140	+ at 1/300	− at 1/10

Though jaundice and pulmonary infiltration are admittedly rare in canicola fever, they nevertheless occur ; for example, cases showing both these conditions have lately been reported by Günther-Kühne and others.[1] The serological results in our case leave no doubt, I believe, that our diagnosis was correct.

Military Hospital, Cowglen,
Glasgow. JOHN MACKAY-DICK.

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[1] Günther-Kühne, von H., Rimpau, W., Schubert, H. *Dtsch. med. Wschr.* 1949, 74, 129.

ANURIA FOLLOWING ISCHÆMIA OF RENAL CORTEX

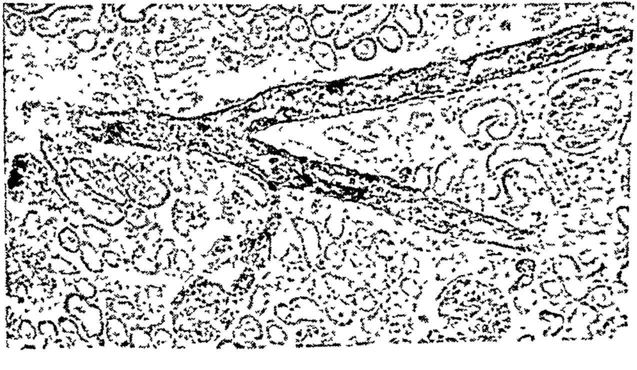
SIR,—In his article of June 4, Dr. Solymoss mentions Furtwaengler [1] as having suggested thrombosis or spasm of renal vessels as the ætiological factor in symmetrical cortical necrosis.

It is interesting to recall that in 1911 Professor Teacher,[2] of Glasgow, wrote of cortical necrosis:

> "It is an anæmic necrosis or infarction affecting about two-thirds of the whole renal cortex in both kidneys, and it is caused by thrombosis in the interlobular arteries, the peculiar distribution of which is best explained on the theory of spasmodic contraction affecting these arteries and so favouring the formation of localized thrombus."

He also considered the hepatic lesions of eclampsia as being of the nature of infarcts. As early as 1906 Professor Jardine,[3] of Glasgow, quoted Teacher's opinion that the renal lesion is essentially an infarction, and he provided a beautiful coloured illustration, by A. K. Maxwell, of confluent infarction. In 1911 Jardine and Teacher [4] published contrasting illustrations of cortical necrosis, diffuse and focal, in eclampsia. To the naked eye the lesions encountered are sometimes more correctly described as confluent infarcts than as symmetrical necrosis, and indeed for many years the professor of pathology at Glasgow illustrated his lecture on infarction with one of Teacher's specimens. The specimen is illustrated in Muir's *Textbook of Pathology*.[5]

Dr. Solymoss appears to consider that the medullary shunt plays an active part in the lesion. In 1947 I illustrated in Bristol a postgraduate lecture on eclampsia with kidneys from the condition. In one case both cortex and medulla showed extreme pallor; histology revealed nothing but lack of blood. In another case the cortex was extremely pale; the medulla was deeply congested, but there was no histological abnormality except that the interlobular arteries were dilated and the medullary vessels stuffed with blood. A third was similar except that there was early necrosis of all structures in the outer two-thirds of the cortex. A fourth showed the classical picture of cortical necrosis. From these cases, and referring to the cases of confluent infarction, I concluded that the medullary shunt merely played a passive rôle. Where the spasm was localised to the interlobulars, the blood in the renal arteries was merely diverted to the medulla. In the case where the kidneys showed blanching of cortex and medulla, I considered that the spasm must have been in the renal arteries.



The accompanying illustration is of renal cortical necrosis where the patient lived for some days in coma; I conclude that spasm has been sufficiently prolonged and severe to lead to devitalisation of the cortex. On relaxation of the spasm, blood has rushed into tissue. The interlobular artery and afferent are enormously dilated and lined by mural. Many glomerulur capillaries are dilated and blood. On the other hand, where the spasm is duration or is sufficiently intermittent, no abnormality may be found in the cortex.

Shaw Dunn and Montgomery [6] conclude vascular abnormality in cortical necrosis in the glomerulus and works back to the arteries. This theory is difficult to Teacher's specimens of multiple infarction point to a prime abnormality in the vessels the infarcted areas—the interlobulars. De Nav considers that the primary abnormality is nec interlobular arteries. This theory falls down can lay out a series of kidneys from cases of and show that necrosis is one end of a scale at end of which are kidneys which yield pathologist except a peculiar distribution Certainly the interlobulars may at times be but this is an end-result; before this there functional abnormality—presumably spasm. shown healed lesions of eclampsia in the vessels. De Navasquez's condition would invariably fatal; eclampsia is not.

Much confusion has been caused by writers to the liver necrosis as zonal. While micro it is especially periportal in distribution, of the liver will show large blotchy areas of irregular in size and shape, and scattered th the liver substance. I agree with Teacher that essentially infarctive and, finding no thrombi, I that they are due to spasm of the hepatic art

To anyone who peruses the British liter eclampsia it will be apparent that Teacher's been completely neglected and that our naked-eye pathology have declined.

N. G. B. McL

Regina, Sask., Canada.

HOSPITAL POSTS FOR THE MIDDLE

SIR,—Of those in difficulties through the intr of the National Health Service, one group seems escaped notice—namely, that of the mid specialists who, for one reason or another, attached to a hospital or clinic at the start service.

I do not know whether we are a large or a sma but I do know a number of others in the same myself. We are too old to try for junior appointments, especially of the residential kind, appointments are almost always made—and ju so—by promotion from the lower ranks; while posts are being created into which we might fit, a sessional or part-time basis.

Here the trouble seems to lie. Obviously the for specialist services cannot have diminished; there are constant complaints of shortage of staff. Yet no arrangements are being made to those who, like myself, have found their priva very much curtailed by the service and the shortage of money, and are competent and take on hospital work, given anything like conditions.

Granted that some of those not employed are unemployable, there are still some of us who ha nothing worse, professionally, than to work in hospitals or clinics, or in private practice, rat attach ourselves in time to institutions taken ov Ministry.

PSYCHIA

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1. Furtwaengler, A. *Krankheitsforschung*, 1927, 4, 349.
2. Teacher, J. H. *Brit. med. J.* 1912, ii, 1125.
3. Jardine, R. *J. Obstet. Gynæc.* July, 1906.
4. Jardine, R., Teacher, J. H. *J. Path. Bact.* 1911, 15, 137.
5. 5th ed., London, 1942; p. 666.
6. Shaw Dunn, J. S., Montgomery, G. L. *J. Path. Bact*
7. De Navasquez, S. *Ibid*, 1938, 46

RESEARCH

your leading article of Sept. 3 you say: ds of teaching hospitals now control funds not be used for ordinary expenses, but we hear of a board using such funds to support

rd of governors of the Hospital for Sick reat Ormond Street, has set aside a substantial its "free income" for just this purpose, and is completely at the disposal of a research It will be used for the support of investiga- for the study here and at other centres of ical advances. The research committee, in its medical members, has representatives of of governors, including a member of the ance committee. These arrangements might quoted as a precedent in other teaching

Alan Moncrieff
Chairman, Research Committee.

spital for Sick Children,
ond Street, London, W.C.1.

IALE-TOAD PREGNANCY TEST

lli Mainini's[1] account of the use of male s for the rapid diagnosis of pregnancy has wed by encouraging reports from workers parts of the world, including Wiltberger and the U.S.A., using *Rana pipiens*; Hinglais lais[3] in France, using *R. esculenta*; and n Britain, using *Bufo arenarum* Hensel (the nerican toad employed by Galli Mainini); nd Genover,[5] in Barcelona, using *B. calamita*, is, and *R. pipiens*; Bach and others,[6] in using *R. esculenta*; and Klopper and Frank,[7] d, using *B. vulgaris*.

per and Frank's series of 51 cases, the male- in 3 women who proved to be pregnant was whereas the Aschheim-Zondek test was

ritius none of the toads or frogs employed workers is to be found. The local toad, *B.* differs from *B. arenarum* Hensel in being ller; when fully grown it weighs only 20–25 In this toad the nuptial excrescences charac- the male in certain species[8] are incon- but Mr. R. Mamet, assistant entomologist partment of agriculture, pointed out to us that can be readily distinguished by a dark patch ted skin over the vocal sac. On dissecting we have found this sign infallible.

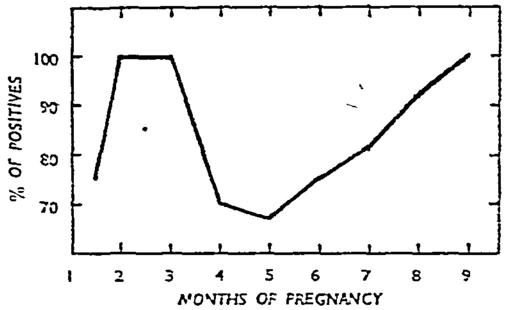
ber of male toads was kept in the laboratory n boxes with a supply of water in shallow ach was fed on 0·5 g. of beef thrice weekly, nended by Crew[9] for female xenopus. A positive invariably free of spermatozoa forty-eight er inoculation with pregnant urine; so we same toad several times with a resting period a week between tests.

ue.—Throughout the experiment Crew's technique jection of urine into the lymph-sac was followed. simple and permits of the release of the animal injection without risk of the urine oozing out he puncture. Before injection the toad's cloacal examined for spermatozoa, which were invariably

, for each test three toads were each injected with urine[4] without regard to their weight. The results were poor; only 40% were positive, and several toads died of toxæmia within an hour of injection. We therefore reduced the amount of urine injected to 5 ml., which proved to be still too much, only 70% giving positive results. Finally we injected 2·5 ml., 2 ml., and 1·5 ml. respectively into each of three toads and found these to be the most satisfactory quantities. With highly toxic samples the 1·5 ml. injection gave the best result, while with very dilute urines 2·5 ml. was best.

Results.—In all, 130 samples of urines were tested. The cases in which the test was made included 10 of amenorrhœa of 2–5 months' duration which later proved not to be due to pregnancy, 1 of hydatidiform mole of long standing, 1 of ectopic gestation which had ruptured eleven days previously, and 1 of a patient in the puerperium. In each of these 13 cases the result was negative.

Results from the remaining 117 samples are shown in the accompanying figure. The urines were of women in different stages of gestation. These results conform with the fact that excretion of gonadotrophic hormones in the urine of pregnant women increases from the first month to the third month, then gradually decreases to about the sixth month, and finally rises again till term.[10] The results also show that male *B. regularis* will nearly always respond to the injection of urine containing more than 5 units gonadotrophin. The marked sensitivity of the male toads to gonadotrophic hormones was reflected in the detection of pregnancy as early as the 5th day after the first missed menstrual period.



Many of the urines were not first morning specimens and some were twenty-four hours old on reaching the laboratory. By keeping the urines in a refrigerator the hormones could be preserved for several months and then still cause spermatogenesis in the toad; but urines not kept on ice might lose potency within forty-eight hours.

Our results agree with those obtained by other workers and show that the male toad *B. regularis* is as sensitive as the other species which have been used for pregnancy tests; it has moreover the advantage of needing a much smaller amount of urine (1·5 ml.) for the test.

We wish to thank Dr. A. Rankine, Director of Medical Services, Mauritius, for permission to publish these findings; Dr. H. D. Tonking, senior pathologist, for his keen interest and advice during the course of the experiment; and Dr. W. Dupré for his encouragement during this work.

Central Laboratory,
Medical Department,
Mauritius.

A. Ng Cheung Hin
J. L. Webb.

Sir,—In your leading article of July 23 on hormone assays, you cited nine species of anura which had been found suitable for the male-toad test for urinary gonadotrophin. These frogs and toads were from America, Europe, and Asia. It may interest your readers in Africa to know that *Bufo regularis* appears to be equally suitable as a test animal. (I am indebted to Mr. G. S. Cansdale, superintendent of the London Zoo, for the identification.)

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. A. E. *Brit. med. J.* 1939, i, 766.

[10] Wright, S. Applied Physiology. London, 1947.

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Medical Research Institute,
Accra, Gold Coast.

MARK H. HUGHES.

MEMORIAL TO C. J. BOND

SIR,—It has been decided in Leicester to raise a fund for a memorial to the late Charles John Bond, C.M.G., F.R.C.S., and there may be friends of his elsewhere who would like to know about this project and be given an opportunity of showing their appreciation.

Bond was born in Leicestershire in 1856, and after his training at University College Hospital, London, he returned to live and work in Leicester until his death in 1939. He was pre-eminently a scientist, and his publications, which are very many and of great interest, show his surgery to have been far ahead of his time. His work was done in the Leicester Royal Infirmary but also, as was the custom in those days, often in the patient's home in the country under very simple conditions. In an exceedingly busy life he never ceased from original and experimental research. This he did in a wide range of subjects which brought him international recognition. He began with two papers on anatomy as a student, passing in turn to surgery, gynæcology, hæmatology, and genetics. Breeding experiments in birds and plants were carried out in his own garden. For forty years he was the close friend of the late Sir Victor Horsley, F.R.S., and
Bond showed in his book, *Recollections of Student
Later Years,* how closely their work was integrated.
During the 1914–18 war he was gazetted h
in the Army Medical Services and became con
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represented on the Inter-Allied Commission on
War Wounds, which met in Paris in 1916–18.
years he studied wounds, immunity, the effect of
on body tissues, and leucocyte activity, finding
publish his own observations which are of particula
in relation to the work on these subjects in the
war twenty-five years later.

Throughout his work, in all its ramifications, he
his wide experience and philosophy with the
problems of the times. Were he alive today
undoubtedly have been keenly interested in the
which he foresaw as early as 1912. Nothing was
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recorded, and deduced with courage, but there was
teristic humility and consideration for the opinions

Surely it must be unique for a surgeon unatt
of the great teaching hospitals to have carried out
valuable work on so many subjects, based on a
logical foundation. Bond decided to work in the
at a place where, though the material is always a
good, there is no medical school and for many of
years of his life there was no laboratory acc
It seems fitting that such a life should be comm
our inspiration.

It is proposed to place a plaque in the Leicester
Infirmary, and also to create a fund to enable
in biology at the Leicester University College,
greater opportunities for research and trav
contribution to this memorial should be sent to
treasurer, Dr. L. K. Harrison, 2, Springfi
Leicester.

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Medicine and the Law

The Wrong Blood

LAST week the assistant deputy West London
returned a verdict of death by misadven
case of a 43-year-old man who died after
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where the transfusion was given stated in evid
during her absence, an unlabelled specimen w
from a nurse by another technician, and "the
the technician that it was the man's bl
coroner concluded that there had been a mistak
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the pathological department, or possibly in the
logical department itself, by which presumably t
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of anæsthetic cylinders was disclosed in the pr
in Dublin on Sept. 4 of a woman doctor on a c
illegal killing of a patient.

The patient entered hospital for a minor ope
which an anæsthetic was required. The mac
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one for nitrous oxide and one for oxygen. The
finding the oxygen cylinder empty, asked a
replace it; the nurse took a cylinder from

supposed contained oxygen cylinders; it
itrous oxide and the result was fatal.
stated to be the first case of its kind in Eire.
e was that of the nurse, but the prosecution
that the doctor, being a qualified practitioner
tood the difference between the two cylinders
ıger of using nitrous oxide in place of oxygen,
to verify the cylinder used.
ior anæsthetist at the hospital stated in
at a scheme had been prepared to make such
ssible but that it would not be in operation for
.

g to the code agreed by the Medical Defence
the Association of Anæsthetists $2^1/_2$ years ago,[1]
hould be marked in distinctive colours as a
policy, and non-interchangeable connexions
fitted to all anæsthetic apparatus as a long-
r. The mere marking of cylinders will never
event mistakes of the kind reported from

ath after Measles Immunisation

ek the St. Pancras coroner adjourned the
n 3 children who appear to have died of
hich developed after prophylactic injections
asles.

Obituary

E LATE DR. JAMES FERGUSON

writes: "To his many friends it will be a happy
ıat the staff of St. Helier Hospital, to which
on had given so much, was privileged to look
luring his last illness; and it will not be easy
to forget the courage with which he faced it.

[Elliott & Fry

"Coming to Surrey in 1929, he brought to the development of the county hospital service a wisdom which never lost sight of the ideals of the voluntary hospitals, and it was his aim throughout to bring into St. Helier a leavening from the staff of the various teaching hospitals. He did much to avoid a divergence of the municipal and voluntary systems, and as a prominent member of the Surrey Hospitals Divisional Council he helped to outline the pattern of the coming national service.

"His part in the designing of St. Helier showed a rare
f the need to integrate the varied components
ınty health service, and it was an unfailing
happiness to him to discuss or to revisit the
hich he loved. Dr. Ferguson's work and ideas
ibuted much in the field of hospital planning,
ourtesy and human understanding had even
ach by their constant and unassuming reminder
onal relationship on which hospitals ultimately

HE LATE DR. STACEY WILSON

writes: "After reading W. H. D.'s note about
lson's confidence in his powers of observation,
ate an encounter I had with him nearly 50
, when he rejected my application for a life
Vith great courtesy he gave me the grounds for
e opinion and, believing them to be invalid, I
o the head office and was re-examined by the
ical officer, who reversed the decision. It was
ı of deficient air-entry to an upper lobe of the
[had the support of my hospital chief. A year
d a hæmoptysis during a ward round. Now I
was right."

Notes and News

THE YOUNG OFFENDER: A CONFERENCE

THE words "juvenile delinquency" are beginning to have an almost hackneyed ring in some ears: not unreasonably, perhaps, since the public interest excited by this topic is, in the words of the National Association for Mental Health, "quite out of proportion to the relatively small increase in juvenile crime." Opinions on treatment—usually by repressive and retributive measures—are much commoner than studies of causes or of the results of such measures. The association have examined 500 British press-cuttings collected during the first six months of this year, in order to learn what the public pick up from the newspapers about juvenile delinquency. Nearly three-quarters of the cuttings were of signed articles or letters, and many put environmental conditions—broken homes, and lack of living space, food, income, or parental affection or responsibility—among the leading causes; but commonly they ended by demanding greater discipline, punishment, and intimidation. Less than 15% mentioned prevention in any form. Facts, figures, or scientific method were rarely the background of the opinions given: "for many the prototype was clearly the contributor himself in his own childhood; for others the contributor's children, the schoolmaster's class of boys drawn from a particular district, the psychiatrist's or probation officer's highly selected problem cases."

It is possible—indeed likely—as the association note, that views collected in this way do not represent a true cross-section of public opinion, for some of them come from publicity-seekers or from those with special prejudices, while all are subject to editorial selection. Nevertheless the association fear that public interest in the subject—whatever its springs—is so strong that some action might be taken prematurely, before enough is known about the facts. They have therefore convened a conference, jointly with the British Psychological Society, the Howard League for Penal Reform, the Institute for the Scientific Treatment of Delinquency, the Institute of Sociology, and the Royal Medico-Psychological Association, to discuss "The Scientific Study of Juvenile Delinquency." The conference will be held on Saturday, Oct. 1, at the Royal Institution, 21, Albemarle Street, London, W.1, and details of the programme may be had from the secretary, National Association for Mental Health, 39, Queen Anne Street, London, W.1. Invited delegates will represent the Church, judiciary bodies, statutory officials, Government departments, social workers, youth organisations, voluntary bodies, universities, and other educational authorities, as well as the medical and legal professions. A critical examination of delinquency by informed people can do nothing but good, and the conference deserves to be well attended.

FILMS ON THIOPENTONE AND SULPHONAMIDES

Messrs. May & Baker Ltd. have copies of the following medical films which they will lend on request: (1) *Thiopentone Sodium and its Use in Intravenous Anæsthesia*, made in coöperation with the Department of Anæsthetics, Westminster Hospital, London; running-time 38 minutes, on 16 mm. and 35 mm. sound. (2) *Medical Applications of Sulphonamides*; running-time 34 minutes, on 16 mm. and 35 mm. sound. Both films are divided into three sections—introduction (chemistry), pharmacology, and clinical use. Applications, specifying alternative dates when possible, should be addressed to Documentary Film Unit, May & Baker Ltd., Dagenham, Essex, from whom synopses may also be obtained.

Royal College of Obstetricians and Gynæcologists

On Wednesday, Oct. 12, at 2.30 P.M., Prof. R. W. Johnstone will deliver the William Meredith Fletcher Shaw lecture. His subject is to be Scotland's Contribution to the Progress of Midwifery in the 18th and early 19th Centuries.

Regional Board's Revised Estimate Approved

The Minister of Health is reported by the *Daily Telegraph* (Sept. 12) as having approved Sheffield regional hospital board's revised estimate of £12,900,000 for maintenance expenditure in the current year. The board's original estimate of £10,624,580 had been reduced by £221,000; and the new estimate was drawn up in response to the Minister's request. This request was addressed to all boards; and the Sheffield estimate is the first of the revised estimates to be sanctioned.

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[1] See *Lancet*, 1947, i, 72.

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TO THE ÆTIOLOGY OF GRAVES'S DISEASE *

J. H. MEANS
M.D. Harvard
PROFESSOR OF CLINICAL MEDICINE, HARVARD
RSITY; CHIEF OF THE MEDICAL SERVICES,
SSACHUSETTS GENERAL HOSPITAL, BOSTON

hyperthyroidism is usually present at some raves's disease this is not to be regarded as y simple endocrinopathy like primary athy- ull's disease; it is a widespread and complex mal disorder involving, besides the thyroid, ocrine glands, the tissues of the orbit, the he thymus, and the lymphatic, reticulo- l, hæmopoietic, muscular, nervous, and very r bodily systems.

iology of Graves's disease is a challenging r inquiry, and, particularly as regards its nifestations, its treatment presents an urgent or the clinician. I cannot offer any solutions; rely make surmises and indicate approaches eing used and clues which it may be profitable in the future.

's disease the primacy of the thyroid gland, y use that term in a negative sense, is indis- The gland has undergone atrophy or been , and all the manifestations of the disease may reted as the result, direct or indirect, of lack d hormone throughout the body. One cannot al confidence assert that Graves's disease ally the opposite. The primacy of the thyroid Graves's disease has never been conclusively ed.

wish to see simple hyperthyroidism we can feed land to normal people, or we can find it occurring in cases of oversecreting thyroid adenoma. ckground to our inquiry into the nature of disease, it may be well to examine this seemingly isturbance.

TOXIC ADENOMA OF THE THYROID

te Henry S. Plummer (1926), of the Mayo as chiefly responsible for distinguishing between enoma of the thyroid and Graves's disease, or lmic goitre, as he preferred to call it, and for g them as of different origin. For many years d the validity of this distinction. I never denied ence of toxic adenoma; indeed I admitted that, ere were plenty of instances of oversecreting in other endocrine glands, it was reasonable t them in the thyroid. However, I failed to , in my clinic, cases which on clinical grounds confidently call Plummer's disease rather than disease. The thyrotoxic patients with nodules thyroid glands I took to be cases of Graves's with goitres which happened to be nodular.

dvent of radioactive iodine has entirely changed rpretation. We have proved with this agent e oversecreting tumours may occur in the thyroid, t the hyperthyroidism they produce is ætio- distinct from that of Graves's disease. The alone oversecretes in Plummer's disease; the land in Graves's disease.

highly probable that the activities of all tissues, true neoplasms, are under either nervous or l control, or both. Neoplasms are almost cer- ot under nervous control, and it seems likely ey have also largely escaped from humoral

Investigation of Function

The function of thyroid adenomata can be studied by giving the patient tracer doses of radioactive iodine. It is well established now by extensive investigations on animals that the uptake of labelled iodine by the thyroid gland is a dependable index of the rate of secretory activity of the thyroid cells. Uptake after administration of tracer doses can be determined in at least three ways: scanning over the region of the thyroid with an externally applied Geiger counter is the most direct way; excision of thyroid tissue and the making of autoradiograms with tissue slices is another; and a third, indirect, method is to determine what proportion of the administered dose of radioactivity is excreted in the urine, and then to assume that the remainder has been retained for the most part by the thyroid gland.

When one applies these methods to the study of thyroid tumours, the results range from that in which a tumour takes up no iodine, and hence is to be regarded as totally inactive, to one in which a tumour takes up iodine with great avidity and the remainder of the thyroid takes up little or none.

Malignancy

In the thyroid gland, as in most other tissues, both benign and malignant tumours may be found. Whether the malignant tumours only originate in the benign or may arise de novo from previously normal tissue is unknown. There is plenty of evidence that benign thyroid tumours may ultimately become malignant. But it is also apparent that malignant tumours usually secrete only slightly, if at all, whereas benign ones may secrete enough to produce hyperthyroidism, and when they have done so the possibility of their becoming also malignant is remote. Indeed, it is extremely rare to find cancer in the thyroid gland of any thyrotoxic persons, whether the source of their hyperthyroidism is a tumour or the diffuse hyperplasia of Graves's disease. For many years we considered hyperthyroidism a good guarantee against thyroid cancer. Recently we have found histologically malignant nodules buried in the hyperplastic thyroids in five cases of Graves's disease; none of them formed metastases, and what might have happened to them had they remained in situ cannot be said. In spite of this experience we still believe that, to a large extent, hyperplasia and malignant neoplasia are mutually exclusive. The significance of this relationship is not yet apparent, but it may later become so. It is worth bearing in mind.

Life History of Adenoma

The life history of the oversecreting thyroid nodule has been well worked out in our clinic with radioactive iodine by Dobyns and Lennon (1948). The important phases are shown diagrammatically in fig. 1. Here is portrayed an adenoma which produces thyroid hormone from its birth onwards. In the beginning it is very small and its contribution of hormone is insignificant compared with that of the rest of the gland. The thyroid gland, as the diagram shows, is under pituitary control, making just enough total hormone to maintain the patient in a euthyroid state. However, the tumour grows out of control and, as it does so, contributes more and more hormone in simple relation to the total volume of its parenchyma. The pituitary gland, we suspect (it has not been proved), in these circumstances restricts its output of thyroid-stimulating hormone so that as the tumour produces more and more hormone, the remainder of the thyroid, in compensation, makes less and less. Finally, as the tumour grows, the time comes when it alone makes enough thyroid hormone to keep the patient in a euthyroid state. At this point, we suspect, on the basis of what is actually known of pituitary-thyroid

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lecture delivered at University College Hospital Medical ol, London, on June 23, 1949.

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Sept. 20, Prof. S. L. Baker will speak on Bone and Joint Pathology, and on Thursday, Sept. 22, Prof. C. H. Browning, F.R.S., on Bacteriological Principles Governing Chemotherapy. Both lectures will be given at 4.30 P.M. in the anatomy lecture theatre of Edinburgh University.

International Congress of Forensic and Social Medicine

The third congress of the International Academy of Forensic and Social Medicine will be held in Cairo from March 21 to 26, 1950.

Welsh National School of Medicine, Cardiff

The opening sessional address of this school will be given on Thursday, Oct. 6, by Dr. William Pickles, medical officer of health for Aysgarth.

Biochemical Society

A meeting of this society will be held in the department of biochemistry, School of Medicine, Leeds, 2, on Friday, Sept. 23, at 11 A.M.

Royal Free Hospital School of Medicine

At 3 P.M. on Friday, Sept. 30, at B.M.A. House, Tavistock Square, London, W.C.1, Mr. James Laver will deliver the inaugural address of the new session. His subject will be Clothes and Psychic Health.

Oliver Memorial Fund

The second award of this Fund has been made to Dr. H. F. Brewer, clinical pathologist to St. Bartholomew's Hospital. Dr. Brewer has been medical officer to the British Red Cross London Blood Transfusion Service for 16 years.

Minister of Health to Visit India

Mr. Aneurin Bevan has accepted an invitation from Mr. Nehru to visit India. A Reuter message, quoted by the *Times* (Sept. 12), says that the invitation is understood to have been prompted by Mr. Nehru's desire to have Mr. Bevan's advice on India's health problems.

Review of Cancer Research

A series of fifteen articles on cancer has been prepared by Mr. Lester Grant, of the *New York Herald Tribune*, with the help of the U.S. Public Health Service and the American Cancer Society. The articles, which review progress in this field, in language understandable to the layman, may be obtained without charge on application to the department of natural sciences, UNESCO, 19, Avenue Kléber, Paris 16°.

Rheumatism Centre for Sheffield

Sheffield is to have a centre for the investigation and treatment of rheumatic disorders. The *Sheffield Telegraph* (Sept. 6) reports that this is to be set up jointly by the board of governors of the United Sheffield Hospitals and the regional hospital board; research will be developed by the two boards in collaboration with the university. A full-time consultant is to take charge of the centre.

Course on Rehabilitation of the Disabled

Twenty European delegates—physicians, surgeons, and specialists in social affairs—are to attend a course next month on the rehabilitation and resettlement of the disabled. The course, which will be under the general direction of Dr. Harold Balme, of the Ministry of Health, and Mr. G. C. H. Slater, of the Ministry of Labour and National Service, has been arranged by the British Council, in coöperation with these two Ministries and the Ministry of Pensions. A similar course was held last year.

U.S. Congress Delegation in Britain

Members of the House of Representatives' committee concerned with the national health insurance legislation introduced by the Administration in Congress, have been in England this week. On Monday they visited the Ministry of Health where they talked with the Minister and officials; and the programme arranged for them between then and their departure for Stockholm on Friday included a day in Oxford and visits to King's College Hospital, Guy's Hospital, and the headquarters of the North-West Metropolitan regional hospital board, London County Council, and the Nuffield Foundation. Meetings were also arranged with representatives of the Medical Practices Committee and the Dental Estimates Board, and with Dr. Charles Hill, secretary of the British Medical Association.

C.M.F. Surgeons' Club

The annual dinner of this club will take place
Hotel, London, W.1, on Sept. 29. Applications and cheques for 25*s*. should be sent to Mr. Guy
Keats House, Guy's Hospital, S.E.1.

Chadwick Lectures

On Thursday, Dec. 8, at 4.30 P.M., at St. Mary,
medical school, Praed Street, London, W.2, Dr G
will give the Malcolm Morris lecture on Generalised Sclerosis. Details of other public lectures to be
autumn may be had from the secretary of the
Abbey House, Westminster, S.W.1.

'Paramisal Sodium,' manufactured by Her
ceuticals Ltd., will in future be marketed in the name 'Paramisan Sodium,' which has hitherto
only abroad.

The effect on National Insurance benefits of
hospital is explained in a leaflet (N.I.9), of which
to keep a stock for the use of patients.

CORRIGENDUM: *Inheritance of Nodular Gout*
article of July 30 (p. 198), Dr. W. P. U. J
comment by Prof. R. A. Fisher, F.R.S. The comment should read: ". . . it is possible that it
gene having a similar effect though at a different

Births, Marriages, and Deaths

BIRTHS

CLARKE.—On Sept. 3, at Colomendy, Ruthin, the
E. G. W. Clarke—a daughter.

COUCHMAN.—On Sept. 4, at Oxford, the wife of Dr. J. M.
D.S.C.—a son.

HOFFMANN.—On Sept. 8, the wife of Dr. B. L. Ho

PEATFIELD.—On Sept. 3, in London, the wife of M
Peatfield, F.R.C.S.—a son.

POWELL.—On Sept. 4, the wife of Dr. B. W. Powell—a

ROBINSON.—On Aug. 31, at Danby-in-Cleveland, the
Dr. R. A. Robinson—a son.

SCOTSON.—On Sept. 4, the wife of Mr. F. H. Scotson,
daughter.

WILLIAMSON.—On Sept. 3, at Macclesfield, the wife of
Williamson—a son.

MARRIAGES

BLYTHE—SKIDMORE.—On Sept. 10, at Tettenhall, S
Blythe to Clarice A. Skidmore, M.B.

GIBB—DAVIES.—On Sept. 3, at Lower Peover, Robert
to Ena Anne Davies.

KING—BARNARD.—On Sept. 10, at Norton, Derbyshire
Michael King, M.B., to Barbara Lilian Claudia Barn

McELLIGOTT—SCANLAN.—On Sept. 7, in Dublin, G.
Malins McElligott, [illegible] to Mollie Scanlan
terham

MANNING—O'FLAHERTY Flaherty
Claude Manning, M Raglan

SCALES—WRIGHT.—On Wright
Scales, M.R.C.S., to Wilts, I

SMITH—BLATHERWICK.—
Smith, M.B., to Marjorie Blatherwick.

WAIND—RYCROFT.—On Sept. 7, at Skipton, Arthur P
Waind, D.SC., M.D., to Catherine Mary Rycroft, M.B.

DEATHS

DENSHAM.—On Sept. 8, at Parkstone, Dorset, Ashley
M.R.C.S., aged 79.

FINN.—On Sept. 11, at Ashwick, near Bath, Patrick T
L.R.C.P.E.

HAY.—On Sept. 8, Edmund Hay, M.B. Edin.

McCALL.—On Sept. 9, at Rudgwick, Sussex, Annie M
Berne.

MARTIN.—On Sept. 5, in London, William Whittle M
Manc., D.P.H.

O'CONNOR.—On Sept. 5, at Epsom, James Alphonsus O'
M.B. Glasg., aged 55.

ROBERTS.—On Sept. 8, at Heswall, Cheshire, Hugh Le
M.D. Edin.

ROBERTSON.—On Sept. 6, in Manchester, William F
M.R.C.S., aged 78.

STEWART.—On Sept. 3, in Manchester, William Stewart, M

STRAIN.—On Sept. 10, William London Strain, M.B. Glas

Appointments

DENTON, P. H., M.D. Lond., M.R.C.P.: physician, Sw
Cirencester group of hospitals.

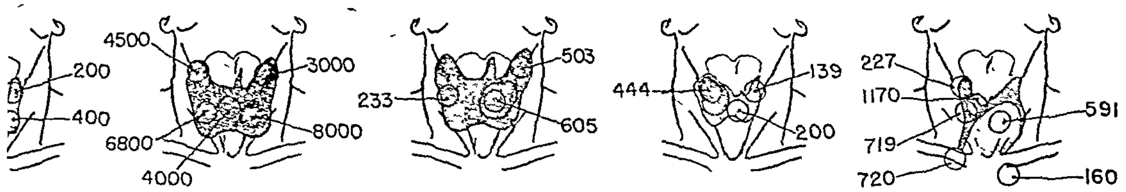
DUFFIELD, J. E., B.A., D.M. Oxfd, D.P.M.: psychiatrist to
Regional Hospital Board.

GEMMELL, ELIZABETH, M.B. Edin., D.T.M. & H.: M.O., Sa

PATERSON, A. S., M.A. Oxfd, M.D. Edin., F.R.C.P., D.P.M.
consulting psychiatrist, French Hospital and D
London.

PAUL, F. A., L.R.C.P.E., D.P.H.: physician-superintendent, L
Disease [illegible] ium, Stornoway, and
trative [illegible] Lewis Hospital, St

WALLACE, H [illegible] M.D. Camb., M.R.C.P.: physician, S
Hospital for Diseases of the Skin, London.



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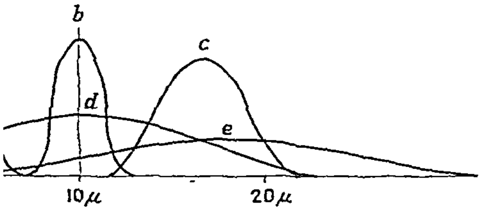

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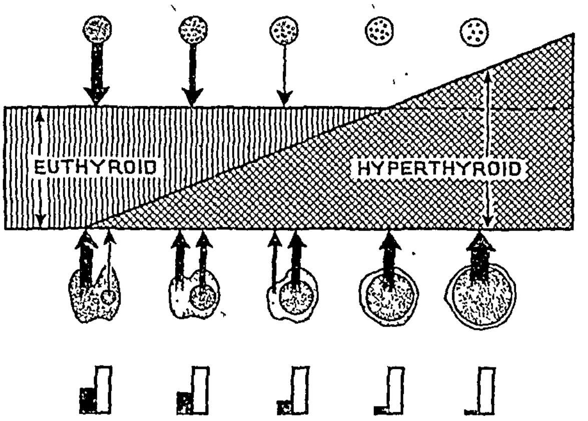


Fig. 1—Life history of secreting thyroid adenoma ("hot" nodule). Upper row of circles represents anterior lobe of pituitary gland; intensity of stippling and width of arrows indicate degree of thyrotropic activity.

Lower row of circles, enlarging from left to right, denote growth of tumour in thyroid gland; intensity of stippling denotes functional activity disclosed by uptake of radioactive iodine. Arrows, by their thickness, indicate contribution of thyroid hormone by both tumour and remainder of thyroid gland.

Single-hatched zone indicates portion of B.M.R. produced by hormone from non-neoplastic thyroid parenchyma, and cross-hatched zone that by hormone from tumour.

Columns at base represent cell height: black, of thyroid parenchyma; white, of tumour.

balance, that the pituitary gland ceases altogether to produce thyroid-stimulating hormone, and the normal thyroid parenchyma consequently becomes atrophic and functionless. However, the process does not stop here. The tumour, being out of control, continues to grow *and make even greater quantities of thyroid hormone.* The patient therefore at last becomes thyrotoxic and enters a stage in which he can be truly said to have a toxic adenoma of the thyroid.

This diagrammatic simplification (fig. 1) is based not only on collections of radio-iodine by the thyroid and basal metabolic rates (B.M.R.) but also on measurements of the mean acinar cell height of the thyroid parenchyma. The extensive studies of Rawson and Starr (1938) have demonstrated a close relation between the height of thyroid cells and their functional activity. Dobyns and Lennon (1948) have shown that the same holds true, usually but not always, for the epithelium of thyroid tumours. In fig. 1 I have therefore indicated *cell heights as well as function estimated from iodine* collections. The height of the tumour cells, it will be seen, is above that of the normal cells from the beginning and remains fixed at this high level, whereas that of the normal cells steadily declines as the tumour takes over and the *pituitary gland restricts its output* of thyrotropic hormone.

The situation in Graves's disease is altogether different. Here we have no evidence that the thyroid parenchyma escapes from hormonic control. Unless, perchance, the sensitivity of thyroid cells as end-organs is altered, which is possible but not proved, we may assume that the thyroid abnormality in Graves's disease lies in the control of the thyroid gland rather than in the gland itself.

Pituitary-thyroid Axis

Salter (1940) referred to the pituitary-thyroid relationship as the pituitary-thyroid axis, and this is a convenient term to use. The pituitary gland makes a hormone which stimulates the thyroid gland to make its hormone, which in turn inhibits the pituitary gland. It may be regarded as, within limits, an automatic physiological mechanism. As I conceive the situation in toxic adenoma of the thyroid, it is one in which the axis functions ably to preserve the euthyroid state of the patient until the limit of its ability to effect an adjustment is reached. *Only at this point does the patient* thyrotoxic. In the thyrotoxicosis of Graves's on the other hand, I regard the axis as out of from the beginning or as receiving a morbid from the hypothalamus.

In fig. 2 I have indicated these relationships. we have parallel increases in iodine uptake, size, cell height, and B.M.R. All these may be due increased thyrotropic activity of the pituitary or possibly to increased sensitivity of the thyroid to its pituitary stimulator. If the latter were the one would expect compensation for a time until it its limit. Whether such compensation occurs determining. An approach seems to be to dis *what really is the normal stimulus to the th* function of the pituitary gland. Is it the absolute of thyroid hormone in the blood, the B.M.R. of patient, or what? The answer to this question provide a clue to the ætiology of Graves's disease.

Results Obtained with Radio-iodine

In fig. 2 I have also indicated one of the reasons for scepticism, before the days of radio-iodine, about existence of toxic thyroid adenoma. Graves's may occur in persons with non-secreting nodules their thyroids; this condition would be called, descriptively, toxic nodular goitre, but it is Graves's disease with incidental thyroid nodule nodules, neoplastic or other. Before radio-iodine ca along, such situations made for confusion; now its use we can very easily separate secreting from no secreting nodules and thus understand the process more accurately. In our clinic we call se *nodules "hot" and non-secreting nodules* "cold and for convenience I shall use that terminology fr here on.

The sort of thing one finds on scanning the neck wi the directional Geiger counter after a tracer dose of radi iodine, in the several conditions I have been talki about, is shown in fig. 3. The circles indicate the locati of the aperture of the counter, and the numerals indica the detected nuclear disintegrations per minute observe in those areas. The normal value is 200–400 count

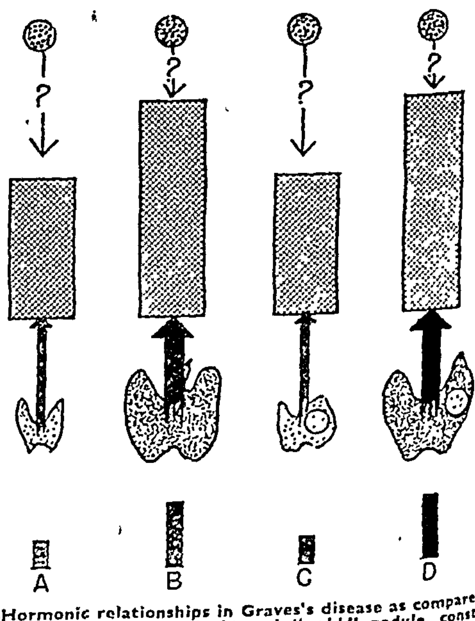
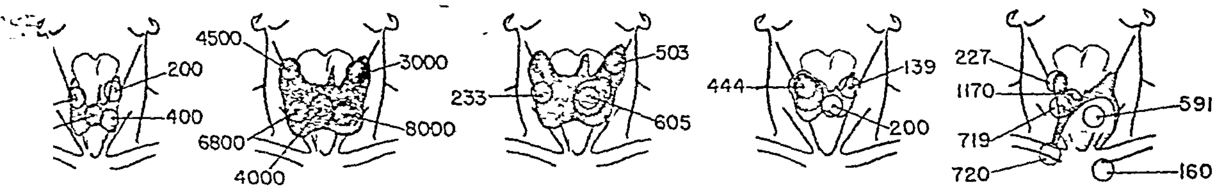


Fig. 2—Hormonic relationships in Graves's disease as compared with normal, with or without incidental "cold" nodule, constructed in similar fashion as fig. 1. Height of cross-hatched rectangles indicates B.M.R.; columns at base denote height of thyroid acinar cells. A, normal thyroid; B, Graves's disease with thyrotoxicosis; C, normal thyroid with incidental nodule; D, Graves's disease with incidental nodule.



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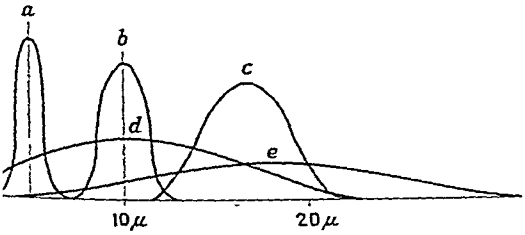

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Warthin (1938) attached great importance to the involvement of lymphoid tissue in Graves's disease. He claimed that it constituted the most striking feature of the histopathology of the disease, and he looked on it as an expression of a constitutional state of the thymicolymphatic type which he called the "Graves's constitution." Unless one were born with this, so Warthin claimed, one would never get exophthalmic goitre. I am not prepared to accept Warthin's contentions unreservedly, but I am to some degree in sympathy with them. There can be small doubt that inheritance plays some rôle in Graves's disease; also it is impressive that lymphoid high lights keep appearing, first in one place and then in another, in the over-all picture.

When Rawson and Starr found that lymph-node tissue, as well as thyroid and thymus tissue, would inactivate thyrotropic hormone, I at once thought of Warthin's old theory. I also recalled that in the ophthalmopathy of Graves's disease the ocular muscles are invaded by lymphocytes—indeed actual lymphorrhages may be found in them. All these facts concerning lymphatic tissue in Graves's disease must be related and must have some significance, but what it may be I cannot tell. Perhaps, however, Warthin was right, and here may lie one clue, at least, to the enigma of Graves's disease. Certainly the lymphatic component deserves further and vigorous study, and so does the muscular component. It is well known that some patients present a myopathy not merely in the orbit but also throughout the entire skeletal muscular system. Instead of the orbits being selectively involved, it is possible that the state of affairs there is merely a local exaggeration of a widespread process, conditioned by local peculiarities.

In any event, in my own thinking, I keep returning to the orbit. I cannot escape a strong conviction that the solution to the problem it presents may solve that of the whole disease. The production of exophthalmos in animals with pituitary extracts seems a very important clue, but it is disconcerting (1) that none of the preparations of thyrotropic hormone thus far used are completely pure, which fact leaves open the possibility of their containing an exophthalmos-producing substance other than thyrotropic hormone; and (2) that so far as I can discover, Graves's disease does not occur in animals, which fact leaves open the possibility that the exophthalmos produced in them differs in pathogenesis from that of Graves's disease in man.

In human Graves's disease there are two categories of eye signs: (1) wide palpebral fissures, lid retraction, and lid lag, due to levator spasm; and (2) swelling of the orbital tissues, which pushes the eyeballs forward and exudes round the globes, causing swelling of the eyelids (Rundle and Pochin 1944). The characteristic limitation in the movement of the eyeballs is interpreted as a result of weakness of the extrinsic muscles, which are the seat of a myopathy, itself an essential part of the total Graves's syndrome. The morbid anatomy, in its gross features, is fairly well known. There is, as Rundle and Pochin clearly showed, an increase in the total fat in the orbit. There is also, at least in the severer stages, an increase in orbital water content. The muscles display, in the more malignant types, a profound and characteristic myopathy. They are invaded both by fat and by lymphoid elements. What we need now is some biochemical, especially cytochemical, information about this amazing lesion.

It has seemed to me for some years that quantitative data on intraorbital pressure and records of how it is affected by treatment might be particularly illuminating. I was therefore delighted to receive a monograph on clinical orbitonometry with the description of a successful orbitonometer from Dr. A. C. Copper (1948) of Leiden. I have since visited his laboratory. Copper's permits the measurement of the backward displac of the eyeball when any desired pressure is ap its anterior surface.† Such measurements, I am can be accepted as indices of intra-orbital pr Copper's orbitonometer is at the same time an ex exophthalmometer—i.e., it can be used to the exact position of the eyeball in relation to connecting the outer bony angles of the two One measures simultaneously the intra-orbital p and the degree of proptosis. The proptosis can be to be the resultant of the forces which tend to the cyball out—i.e., increased orbital pressure swelling—and the forces which tend to pull it —i.e., the tug exerted by the muscles. Whatev actual strength of these opposing forces, it mu assumed that, when the position of the eyeball, or otherwise, is stationary, these forces must equal.

Copper reports orbitonometric data on normal p and in Graves's disease and acromegaly. I quote his conclusions as follows:

> "In thyrotoxicosis and classic Graves's disease o tension was either normal or increased. An increase more evident in eight postoperative cases. The c most likely suggest a state of mild œdema of the o tissues.
>
> "In the hyperophthalmopathic type orbital tension markedly increased, like in diffuse infiltration. On the cases showed a progress to normal in the cour treatment with thyroid extract.
>
> "Both our clinical observations and the orbitonom results are in accord with Means's concept of a 'spec of types of phases within the clinical entity.' Orbit metry assists in differentiating the types and in diagn a possible progression to hyperophthalmopathy."

Copper here refers to my expressed belief that is no such thing as a type of malignant exophthal ætiologically distinct from Graves's disease. I glad to find that he agreed with me. I believe Po does also.

Copper's observation that in one case in the hyper thalmopathic phase the orbital pressure dropped normal during treatment with thyroid extract I particularly exciting, though one case proves noth We have given thyroid extract in cases of progres ophthalmopathy on the theory that it inhibits pituitary gland as regards oversecreting of what thyrotropic or other hormone causes the lesion. beneficial effect is neither prompt nor dramatic, judging by clinical observation, it offers more than other drug thus far tried. If by further orbitonome observations it can be shown that thyroid extract re does dependably lower intra-orbital pressure, such findi will be of great theoretical and practical interest.

Concentration of Thyrotropic Hormone

For the solution of the eye problem of Graves's dis and the larger one of the entire morbid state, determi tion of the concentration of thyrotropic hormones body fluids is obviously indispensable.

Rawson and Starr (1938) devised a fairly satisfacto method for urine, making use of the effect of inject material on the height of the thyroid cells in chic The very limited data which they have obtained indica that in thyrotoxic Graves's disease there is an increas excretion of thyrotropic hormone in the inactivat form.

De Robertis (1942, 1949) observed the rapid accumu tion of colloid droplets in the apices of thyroid ce after the injection of thyrotropic hormone, and u

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† This instrument can be obtained from C. W. Dixey & Sons Ltd 9, Cavendish Square, W.1.

st for thyrotropic hormone, finding a relation-
en the number of droplets and the amount
given. In the blood of patients with Graves's
found an excess in those exhibiting the
of progressive or malignant ophthalmopathy.
(1949) has revived and improved the well-
hibian-metamorphosis test, and believes that
can estimate the concentration of both the
and the thyroid hormones in the serum.
s tadpoles into a non-metamorphosing state
on, and then injects them intraperitoneally
st fluid—e.g., serum. Two observations are
: the effect on metamorphosis (growth of
ities) and the effect on the tadpole's thyroid
rotropic hormone causes metamorphosis and
y of the thyroid epithelium ; thyroid hormone
metamorphosis but it leads to atrophy of
epithelium. In normal people and in classic
isease D'Angelo finds little or no detectable
hormone in the serum. In hyperophthalmo-
ves's disease, on the other hand, D'Angelo
siderable amount of thyrotropic hormone in
Only a few observations have been made,
ar D'Angelo's and De Robertis's results seem

Sensitivity

ough the evidence is scanty, we may still be
to speculate on its possible significance. If
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nderwent a change in end-organ sensitivity.
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perophthalmopathic phase, because in such
arefully refrain from thyroidectomy. However
lly vitally needed is information on the sensi-
nd-organs to the thyroid hormone, and what
ermine it. Almost no facts on these important
ave yet been obtained. How actually does
ormone act on cells, and what potentiates or
uch action ? To these questions we badly
ers.

Gland

we hold that Graves's disease is a widespread
licated constitutional disorder, we may next
hat other endocrine glands besides the pituitary
hyroid are importantly involved in its morbid
m. The thymus is undoubtedly, but is that
rine gland ? We know nothing very definite
rôle of the thymus save that it is often some-
rged in Graves's disease. Selwyn Taylor tells
as fed five patients with Graves's disease on
ves' thymus and noted a fall in B.M.R. and
ent in symptoms, but the data are not sufficient
nclusive. Then there are the ancient claims
surgeons as von Harberer and Halsted that
my contributes some benefit. In passing we may note that the thymus plays a part in the alarm reaction of Selye ; so too does the adrenal cortex, which moreover, is a perfectly respectable endocrine gland. Therefore its rôle in Graves's disease may properly next concern us.

Adrenal Cortex

There is rapidly accumulating evidence of a vitally important balance between the thyroid gland and the adrenal cortex. The hormones of each appear to protect against ill effects of overproduction of the other. Thus Koelsche and Kendall (1935) found that adrenocortical hormones exert a sparing action against the negative nitrogen balance induced by thyroxine, and G. W. Thorn (personal communication) has found that rats made thyrotoxic with thyroid hormone lose less body-weight and show less increase in heart weight if given adrenocortical extract than do controls given thyroid hormone alone. Conversely, Zondek (1935) states that thyroidectomised animals survive total adrenalectomy longer than do those possessing thyroids, and it is well known clinically that patients with hypofunction of the adrenal cortex are far more sensitive to thyroid hormone than are normal persons.

The opportunities nowadays for studying the inter-relations of the thyroid gland and the adrenal cortex are abundant, because we have many tests for the functional activity of both these organs. The thyroid gland can be tested, for example, by its response to thyrotropic hormone, to iodine, and to anti-thyroid drugs, and the effect of thyroid hormone on targets as expressed by the B.M.R. We can also measure the avidity of the thyroid gland for iodine by observing its uptake of radioactive iodine. On the adrenal side, among other things, we can observe the responses to the adrenocorticotropic hormone, and we can identify steroids of adrenal origin in the urine.

I have long been curious about the function of the adrenal cortex in Graves's disease, and when, in 1945, the late Edwin J. Kepler spent six months in my clinic, I induced him to apply his water test of cortical function to patients with the thyrotoxicosis of Graves's disease. He did this in a few cases, but the results were equivocal. More recently the eosinophil has made its entry upon the adrenal stage as a good index of cortical function. The eosinophilic population of normal blood is 100–300 per c.mm. When cortical function increases through the impact of adrenocorticotropic hormone, there is a sharp fall in the eosinophil-count. One can give the hormone directly to man or animal, or one can stimulate the pituitary to increase its output of the hormone by giving adrenaline (epinephrine). If after the administration of either adrenaline or adrenocorticotropic hormone there is no fall in the eosinophil-count, the conclusion is that the cortex is capable of being stimulated.

Studies are under way in our clinic on the cortical function in thyrotoxicosis and in myxœdema, and of the effect of treatment in each, making use of the several methods of testing which I have mentioned. The data are only just being obtained. All that can now be said is that in untreated myxœdema the response to adrenaline is at or below the lower limit of normal, and in thyrotoxicosis the eosinophil-count, which before treatment runs in the low range of 30 per c.mm., rises during treatment with propylthiouracil to a normal range. It seems, then, that in myxœdema the cortex is underactive and in thyrotoxicosis, on the other hand, it is working overtime.

One is tempted to generalise that, when either adrenal cortex or thyroid gland increases or decreases its functional activity, the other does likewise in compensation. In addisonian anæmia there is characteristically a low B.M.R., and Thorn tells me that there is also a slow uptake of radioactive iodine—another manifestation of lowered thyroid function. When Kendall's Compound E is given in addisonian anæmia, the uptake of radioactive iodine becomes normal and the B.M.R. rises.

Thorn holds the theory that with waning cortical function there is an increase in lymphoid elements, and that these absorb thyrotropic hormone. In so far as they can compete with the thyroid for thyrotropic hormone they can spare the patient from the ill effects of thyroid hormone in the presence of low cortical function. Thus emerges a link between the lymphatic system and the suprarenal cortex, which in the face of the well-known lymphoid hyperplasia of Graves's disease seems to be pregnant with meaning, but to me at least this meaning still remains obscure.

One other item of Thorn's I regard as of extreme interest. In his large series of addisonian anæmia he finds a past history of Graves's disease significantly more often than in any random series of patients. I shall have to leave both thymus gland and adrenal cortex at that. Certainly they deserve intensive study in relation to Graves's disease from every possible angle.

Thyrotoxic Crisis

The thyrotoxic crisis, or thyroid storm, also deserves intensive study. This remarkable event in the course of Graves's disease was formerly far commoner than it is today and may be the "Open Sesame" to the conundrum of Graves's disease. The best guess that I can make about its significance is that it may represent what we may call decompensated Graves's disease. There is an acute failure in the ability of the body to adjust to the thyrotoxicosis; a breakdown occurs, with the fulminating development of hyperthermia. I can see some analogy between it and the hyperthermia of sunstroke. The opportunity to study thyrotoxic crisis but rarely presents itself, and when it does is apt to be lost, because so urgent is the patient's situation that all efforts are directed toward treatment, and investigation goes by the board. I urge any of those who encounter such cases to mobilise all aid possible and obtain all the facts possible about the levels of hormones and electrolytes in body fluids.

Thyroidectomy

As regards primacy, or lack of primacy, of the thyroid gland in Graves's disease, the usual effectiveness of ablation of that organ, whether by surgery, drug, or radiation, is intriguing. Many years ago J. de J. Pemberton, of the Mayo Clinic, remarked to me that the results of subtotal thyroidectomy were better than theoretically they should be. If the morbid cause is left behind, why does not the disease invariably recur after operation? Sometimes it does, but more often it does not. Pemberton suggested that a hormonic vicious circle has been set up in some way in Graves's disease and is broken by thyroidectomy, permitting restoration of normal hormonic balance. Linnell and Greene (1947) also, referring to Boon and to Fenz, introduce the possibility of a vicious circle; they include the hypothalamus, on which thyroxine may act directly. They make the following suggestion:

> "In thyrotoxicosis a hypersensitive hypothalamus, reacting to a normal blood thryoxine, causes, via the carotid plexus and the pituitary, a still greater output of thyroxine, thus initiating a vicious circle On this hypothesis it is easy to explain both the influence of mental strain in initiating the disease and the occasional cures produced in early primary cases by rest, psychiatric methods, or thiouracil. It is, on this hypothesis, improbable that a permanent cure could be produced in long-standing cases by any known means other than thyroidectomy."

I cannot believe, nor is it claimed, that this hypothesis has had adequate testing. It seems to me, however, worthy of investigation. If the primary fault in disease lies in an oversensitivity of the thyroxine, we must determine what causes sensitivity. Is it acquired or inherited?

Heredity

The rôle of heredity is indeed a high-priority To assess its importance we need the help of the cist, and a geneticist is already at work on the here at University College Hospital. Linnell and (1947), at the London County Council Thyroid have emphasised the importance of the genetic a to the ætiology of thyrotoxicosis, and Bartels favours the hypothesis that Graves's disease is a bance of balance in the relations between the the vegetative nervous system, and the pituitary, if I understand him aright, is essentially the theor I hold. He further believes that in many cases the must develop on the basis of an inherited defect, he thinks may reasonably be located in the Indeed, in his opinion Graves's disease is "alwa to a genotypic disposition."

Epidemiology

Another clue may lie, I believe, in the fact Graves's disease, at times, is epidemic. In his last on the Danish epidemic Meulengracht (1949) ind that the spot map of cases bears a striking resem to that of an infectious disease. He does not go as to conclude that Graves's disease is infectious he does submit that here is a resemblance which re explanation. I agree on this last point, but I c yet bring myself to believe that infection is a factor in Graves's disease.

CONCLUSION

I surmise that Graves's disease is somewhat anal to the adaptation syndrome of Selye (1946) except it is pathological. Perhaps tentatively we might a "maladaptation syndrome" and look on it type of response that persons of certain constitu pattern make when they encounter certain ad circumstances in living.

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"... I detect in many doctors and many scientists a fai to achieve a corresponding stage of maturity in other re —political, social, cultural, religious, and esthetic. transfer value of achieving maturity in science and medi seems to be very slight indeed.... It is the proper destin man as a human being to achieve maximum maturity. medical profession has made notable strides in promoting exhibiting such maturity in dealing with bodily and men ailments, but no comparable advance has yet been ma toward a mature judgment on historical movements, econo forces, cultural values, moral responsibilities, and relig beliefs. Although this is the special responsibility of liberal arts teacher and scholar, medical schools are in responsible for developing this judgment."—Prof. T. GREENE, in *Trends in Medical Education* (Commonwea Fund, New York, 1949).

TUBERCULOSIS

ONTROL OF AN INFECTIOUS DISEASE

JOHN FRANCIS
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trol of tuberculosis in cattle has been described
(Francis 1947, 1949). I need only repeat here
a satisfactory means of diagnosis (the intra-
berculin test) was developed, eradication of
disease in any country has depended solely
termination of the veterinary profession to
interest of the farmers, obtain support from
ment, and guide the work along rational lines.
e not always been easy tasks. but tuberculosis
been eradicated from Finland, the Channel
vast area of the U.S.A., very largely from
d Sweden, and almost entirely from Denmark
to twenty years ago had an incidence similar
reat Britain). In this country there are already
cattle, out of 8–9 million, in Attested herds.
has the distinction of being the first Attested
there is little doubt that others will soon be
on the mainland.

e, because of the control that can be exerted
dividual animal and herd, the chain of infection
roken relatively easily, and immunisation is
s. In man, however, immunisation is the one
eans of increasing resistance to tuberculosis
reducing the number of clinical cases and
ersons. For this purpose B.C.G. vaccine has
lable for twenty-five years, but it has only
tly been used in Great Britain.

Efficacy of B.C.G.

ief opposition to the use of B.C.G. in Great
s come from G. S. Wilson (1947), and because
ensive knowledge of bacteriology and immunity
act that his conclusions have generally proved
d it is natural that his paper should have made
ple doubt whether it was worth using the
It is, however, not always realised in scientific
at it is at least as important not to be over-
s it is to guard against over-optimism.

n (1948) has dealt with Wilson's criticisms and
"although partly justified they are correct
unessentials and are in many respects erroneous
st; they do not give the impression of being
" Wallgren admits that in his own work the
t played by B.C.G. in the remarkable reduction
ity and mortality cannot be accurately assessed,
bservations show that "while primary pulmo-
rculosis in a child unvaccinated with B.C.G.
show any tendency towards radiographically
able regression during the first six months. in
ho has been vaccinated with B.C.G. and who was
rculin-positive at the time of infection radio-
veal that within this period the condition has
resolved." He continues:

> is also remarkable that I have not seen a single
> tely vaccinated child die from tuberculosis after
> been infected, nor have I observed a single case
> rculous meningitis among vaccinated children. Is,
> he scientifically calculated and statistically reported
> of immunity of such great import if the effect of the
> tion is satisfactory?"

ther Wallgren's reply nor the presentation of
other people (Tytler 1946) have overcome the
on created by Wilson's article; so it is necessary
amine his criticisms.

DIFFERING STANDARDS OF EVIDENCE

n's main thesis is that there are no adequate
ed trials with statistically significant results showing that B.C.G. is effective. If this criticism were true it would have some validity; but it should be pointed out that he adopts entirely different standards of evidence when discussing B.C.G. on the one hand and, say, pasteurisation or different methods of immunisation on the other. He has himself presented the evidence supporting the value of pasteurisation (Wilson 1942), and much of it is seen to depend on falls in the non-pulmonary death-rate when milk is heat-treated or when tuberculosis is eradicated from cattle. But it is well known that the proportion of tuberculosis deaths which are extrapulmonary varies independently of the incidence of infection in cattle. Wilson himself (1947) points out that in American Indians the ratio of non-pulmonary to pulmonary tuberculosis was 2½ : 1, whereas in the general population of the U.S.A. it was about 1 : 5; and as bovine tuberculosis has been eradicated from the U.S.A. the high incidence of non-pulmonary tuberculosis in the Indians can hardly be due to consumption of tuberculous milk. The above example is admittedly extreme, but it is well recognised that the morbidity and mortality of extrapulmonary tuberculosis become steadily less as the tuberculous epidemic progresses. In Australia, where bovine tuberculosis has never been a serious disease and hence no special precautions have been taken to prevent milk-borne infection (Wakefield Rainey 1944), extrapulmonary tuberculosis has diminished more rapidly than in other countries (Holmes 1937).

Admittedly some of the epidemiological evidence that pasteurisation reduces the mortality from extrapulmonary tuberculosis is very convincing, but it is no more convincing than the epidemiological evidence supporting the value of B.C.G., and Wilson (1942, p. 151) admits that it includes no really satisfactory controlled experiment. Hence it is hard to understand his advocacy of pasteurisation and opposition to B.C.G.

The more effective the measures taken to protect children from tuberculous infection, the more necessary does immunisation become to protect the tuberculin-negative adolescent (Birkhaug 1948). In Scandinavia the importance of infection from bovines has been recognised but not overestimated. The work of Hedvall (1942), Magnusson (1942), and especially of Sigurdsson (1945) has shown how the subject should be investigated—by obtaining the collaboration of veterinary surgeons and farmers and studying the epidemic at its source. Meanwhile pasteurisation of milk and eradication of bovine tuberculosis has proceeded in Denmark as a small part of an adequate programme to control human tuberculosis.

Wilson fears that B.C.G. vaccination may interfere with such highly reliable prophylactic measures as vaccination against smallpox and diphtheria. Scarcely anyone doubts the value of these measures; but does the evidence in their favour conform to the standards he demands for B.C.G.? The figures of Harries (1930) showing the results following diphtheria immunisation of the nursing and later the domestic staff of the Birmingham City Fever Hospital were quoted by Topley and Wilson (1946, p. 1397) as being the most convincing, and they doubtless provide very good "demonstrative evidence"; but they are no more a statistically satisfactory result of a controlled experiment than are the results of Wallgren and other Scandinavian workers (see Birkhaug 1948) following vaccination of nurses with B.C.G., or the fall in the death-rate from pulmonary tuberculosis in vaccinated but not in unvaccinated groups in Bornholm (see Malmross 1948).

> The same is true of *smallpox* vaccination: "The evidence that vaccination protects against smallpox is very strong, but unfortunately exact statistical evidence is difficult to obtain" (p. 1891).
>
> Similarly with *typhoid fever* in the first world war: "the exigencies of war, the impossibility of getting complete figures

for the inoculated and the uninoculated exposed to risk, and the fact that the proportion of inoculated men rose, in the British Army, to well over 90% by the end of 1915, rendered impossible the collection of mass figures of a kind suitable for detailed statistical analysis. The general trend of the evidence is not, however, in doubt" (p. 1551).

Discussing plague vaccination Topley and Wilson say that "the results are necessarily difficult to interpret, since it is impossible to know what fall in mortality would have occurred in the absence of vaccination. The fall, however, in this instance was remarkably rapid, and the figures taken in conjunction with those of Table 154 suggest strongly that vaccination played a not unimportant part." Again, in Madagascar, "as in Java, the fall after vaccination was started appears to have been greater than would have been expected in its absence" (p. 1645).

Even with such a potent antigen as tetanus toxoid, "owing to the low incidence of tetanus in peace-time, the efficacy of active immunisation has been for the most part judged by the antitoxin response in the inoculated subject, and it is only in the last few years that *indications* of its prophylactic value have been obtained" (p. 1765).

No reasonable person doubts the value of all the above measures, but as it will be shown later that B.C.G. vaccination is the one immunological procedure in man about which there is satisfactory statistical evidence it is very difficult to understand the stubborn opposition to its general use.

CONTROLLED TRIALS WITH B.C.G.

The results of a number of controlled trials are shown in the accompanying table. The observations of Hyge (1947) deal with a natural epidemic rather than a controlled trial, but this does not reduce their significance.

He described an epidemic of tuberculosis in a school for girls aged 12–18 years: 105 pupils were tuberculin-positive before exposure, 106 were vaccinated with B.C.G., and 94 were tuberculin-negative. The source of infection was a temporary teacher who visited the school for only a limited time. The duration of exposure was two months in all three groups. The pupils were followed up during the first three years after exposure. Of the tuberculin-positive group only 2 had fallen ill with pulmonary tuberculosis during the period of observations, of the B.C.G.-vaccinated group 2 contracted pulmonary tuberculosis and were in need of pneumothorax treatment. Of the tuberculin-negative group 41 fell ill with tuberculous disease; 1 of them died and 5 others needed treatment with pneumothorax. The morbidity-rates in the three groups were 1·9, 1·9, and 43·6% respectively.[1]

In the other experiments every precaution appears to have been taken to make the groups comparable.

Nieman and Loewinsohn (1947) carried out a trial in which 1417 *children were vaccinated 4–6 days after birth; 1414 children* were not vaccinated and served as controls. All the children came from homes free from tuberculosis, as proved by chest radiography, but they lived in an area of Chicago with a high tuberculosis mortality-rate. The groups included negro and white children and paired subgroups were observed for intervals varying from three months to nine years. A primary complex was demonstrated by X rays in 14 vaccinated and 42 unvaccinated children.

Ferguson and Simes (1949) carried out a trial in Indians: families of comparable status in respect of housing, sanitation, and certain other economic and social factors likely to affect the health of children were paired, and one member of each such pair was allotted at random to one of two groups, designated A and B. All children born into the families of group A were vaccinated in one year, while all children born into families of group B in the same year were taken as controls. In the following year this situation would be reversed, and so on throughout the duration of the study. This procedure resulted over a period of years in groups of 306 vaccinated and 303 unvaccinated, which were balanced in respect of both age and environmental factors considered. The trial has lasted fourteen years and 2 vaccinated and 9 control children have died from tuberculosis; all other manifestations of disease have shown about the same relationship.

EFFECT OF IMMUNISATION WITH B.C.G.*

Author	Immunised with B.C.G.		Controls		P
	No.	No. with tuberculosis	No.	No. with tuberculosis	to
Nieman and Loewinsohn 1947	1417	14	1414	42	1
Ferguson and Simes 1949	306	6 **2**	303	29 **9**	1 t 1
Aronsen 1948	1551	**6**	1457	**53**	1 to
Hyge 1947	106	2	94	41	1 t

* Figures in bold type indicate deaths from tuberculos

No data in any way comparable with those shown in t are quoted by Topley and Wilson (1946) to support the any one of the commonly used immunological procedures. T two studies shown above had not been published when article appeared, and only a preliminary announcement of results had been made.

Aronsen and Palmer (1946), and Aronsen (1948) reported a trial in which children in Indian reservations who failed to react to tuberculin were divided into groups on an age-and-sex basis. One group was intradermally with saline and the other with va The study was begun in 1936 and ten years 1550 vaccinated children and 52 of 1457 control chi had died of tuberculosis. The possibility of this being due to chance is about 1 in 10,000, and W goes so far as to admit that the figures are "very st tive"; but he adds that "it may be questioned wh the conclusions drawn from them can legitimate transferred to civilized peoples having a higher d of genetic immunity and exposed, as a rule, to a risk of infection." He says it may perhaps be w remember the law of diminishing returns. It may be well to remember some of the laws of immuni as set forth by Topley and Wilson (1946). They p the well-known evidence that an animal often res much better to a second dose of antigen than t first—i.e., a slight immunity increases the response given dose of antigen. In the production of dipht antitoxin it is recognised that horses having natural antibodies respond much better than having none; but, quite apart from this, Kayne (has suggested, with very good reason, that the diffe between "primitive" and "civilised" persons in response to tuberculosis is that civilised races ha much greater ability than primitive to develop a sp *active resistance to tuberculosis.* Nieman and Loewin (1947) apparently observed no difference in the resp of white or negro children, and there is ample evid from Scandinavia that Europeans do respond sati torily to B.C.G. Therefore, in direct contrast to Wil suggestion, the evidence indicates that civilised viduals would respond at least as well to B.C.G. a primitive. It is, in fact, pointed out by Topley Wilson (1946) that the allergic state is advantageou European nurses but not to African miners.[2]

EVIDENCE FROM ANIMAL EXPERIMENTS

Before discussing this subject one must pay a tri to the basic pioneer work of *Calmette* and Gué Although the significance of their observations on is still disputed, their original ideas and experime on animals laid the *foundation* on which all subsequ work has been built. There is good experimental evide that B.C.G. produces an increased resistance to inva by tubercle bacilli in every species adequately studi It also produces allergy, and so far as I am aware allergy, in experimental animals, has always b associated with immunity. The fact that allergy m later be reduced or abolished without abolishing immunit does not invalidate the truth of the above statemen

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[1] For more recent observations on these girls see *Lancet*, Aug. 13, p. 291.

[2] A fallacy in the last part of this statement is discussed b

terion of successful B.C.G. vaccination is the
nent of a positive tuberculin reaction, and if
e not associated with an increased resistance in
it is in all other animals, it would be one of the
culiar facts in comparative pathology. All our
ge of the pathogenesis and epidemiology of
osis in man does, however, support the view
allergic individual has a heightened resistance
enous reinfection. There are therefore very
reasons for assuming that we have direct
ental evidence of increased resistance in every
ed person who becomes tuberculin-positive.

y and its relation to immunity in tuberculosis is
l at some length by Topley and Wilson (1946).
ng the disease in European nurses and African
s, they admit that, in the heavily infected
nent of the hospital the advantage is with the
person, but they say that in the less heavily
but physically strenuous conditions of the mine
actory the advantage is with the non-allergic.
statement is true, but it involves a confusion
ht: the allergic native is allergic because he is
ing virulent tubercle bacilli, and although he can
this infection fairly well when living in his kraal
ot control it under the adverse conditions of mine
The allergy produced by B.C.G. obviously does
end on the presence of virulent tubercle bacilli
ody.

n this section on the efficacy of B.C.G. by quoting
n's (1948) clinical impressions, and I may perhaps
e by quoting those of Dorothy Price (1949), who

> my mind, B.C.G. offers a simple solution to the
> m of the infant of tuberculous parents. This vaccina-
> ith avirulent bacilli produces in a safe situation,
> y the skin, a minimal primary complex, which is
> enough to produce a tuberculin allergy and afford
> nity against subsequent exogenous re-infection, . . .
> ld say of our Dublin infants in the first year of life
> re exposed in the home to an open case of tuberculosis,
> ver 90% contract the disease; of these 41% die and
> ccupy treatment beds for one to three years. With
> ative vaccination the stay is six weeks in a maternity
> al or three months in a children's institution, or if
> ntact is removed the child may be inoculated at home.
> ying the Swedish vaccine, I would offer 90% security
> t the development of tuberculosis, and the death-rate
> ligible."

t Justifiable to Prohibit the Use of B.C.G.?

ssing the Medical Research Council trial, the
Medical Journal (Editorial 1949a) doubts the
justification of returning unvaccinated children
rculous homes. Is it then justifiable to expose
lin-negative girls to tuberculous patients in
o obtain "statistically satisfactory evidence" on
ue of B.C.G.? Such an action would be considered
sible in every country that has experience of using
and one is glad to note that there are hospitals
t Britain where tuberculin-negative girls are not
to nurse tuberculous patients.

safety of B.C.G. vaccine has been fully established
1946, Holm 1946) and the evidence of its efficacy
ably better than that for any other vaccine. In
ht of these facts, and since in this country many
s but probably ineffective proprietary medicines
purchased, it is very difficult to see on what ethical
s those who wish to use B.C.G. are prevented from
ng.[3] Twenty-five years ago there would have been
ation for intensive work on the standardisation
vaccine and on controlled trials, but this work
w been done for us.

Natural History of Tuberculosis and Methods of Control

William Budd (1863), one of the pioneer epidemiologists, advised his medical colleagues to study natural epidemics in animals in order to throw light on human epidemics. During the first decade of the 19th century there were people who believed that tuberculosis in cattle could be controlled by raising "healthy" cattle that would not develop tuberculosis.[4] This method never met with success, but it has become abundantly clear that when all efforts are concentrated on breaking the chain of infection eradication can be achieved relatively quickly and over vast areas.

Some people believe that civilised men must learn to live with the tubercle bacillus; and it is of course true that a group of persons with healed primary complexes withstands subsequent exogenous infection better than an uninfected group—though it should be remembered that they are already a selected population. But the danger to which a population of "healthy reactors" are exposed is well shown by events during the two world wars, when lowered resistance and increased stresses of various sorts caused many such persons to die of active tuberculosis (Wolff 1940, Long 1942, Bruns 1920). In fact, anyone who regards the "satisfactory" development of a primary complex as desirable is in the same position as those who regard tubercle bacilli in milk as desirable. The dangers of these "methods of immunisation" are well illustrated by the cases of acute tuberculosis in children, and in adolescents who are exposed to infection when still tuberculin-negative.

Wilson says that if "minimal pulmonary, glandular, and other manifestations of tuberculosis are included in the results of trials it may be possible to swell the number of tuberculous cases in the control group, as in Heimbeck's (1936) figures, and make out a theoretically convincing but practically unimportant case for B.C.G. vaccination." In view of the facts I have mentioned this attitude is surely open to question. In addition, all the work on the control of tuberculosis in cattle shows that, for success, tuberculosis must be regarded as an infectious disease, and Myers (1946a and b) has rightly emphasised the fallacies of disregarding "healthy reactors" in man: every person with phthisis was once a "healthy reactor."

The eradication of human tuberculosis is obviously much more difficult and complex than the eradication of bovine tuberculosis, but it has recently been pointed out (Editorial 1949c) that less attention has been paid to the control of human tuberculosis than to its clinical study and treatment. This appears to be generally true: thus Ryle (1948) writes:

> "The morbid 'material' of the hospital ward (sanatorium) consists very largely . . . of end-result conditions for which, as a rule, only a limited amount of relief repays the long stay, the patient investigation, and the anxious expectancy of the sick man or woman. With ætiology—the first essential for prevention—and with prevention itself the majority of physicians and surgeons have curiously little concern."

Again, Ryle says that the *living* human community has been insufficiently considered as an object worthy of study.

It appears that in Great Britain more interest has been taken in the clinically tuberculous person in the sanatorium than has been taken in epidemiological studies and preventive work of the type reported by Sigurdsson (1945), Holm and Holm (1945), Madsen et al. (1942), and Olsen (1943). British veterinarians, on the other hand, while paying little attention to the clinical study

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ent memorandum from the Ministry of Health (*Lancet*,
ly 2, p. 29) indicates that the vaccine will be more generally
ailable than was supposed when this paper was written.

[4] This conflict in the human field is illustrated by Editorials (1949b and c) and by Wingfield (1942). Paterson (1947) has given an interesting account of other conflicts which may arise in course of work on the control of tuberculosis.

of the individual (apart from diagnosis) or to the treatment of tuberculosis, have studied the living animal community—the problems of infection and control—and they have eradicated tuberculosis from many thousands of herds.

Wilson believes in pasteurising milk because he believes it will prevent about 40% of the mortality from tuberculosis in infants.[5] Yet, even when he assumes for the purpose of argument that B.C.G. does afford some measure of protection, he doubts whether it is worth using, and puts forward seven points of difficulty against its adoption. These points have already been met by Wallgren, and since the difficulties were overcome in Norway during enemy occupation, surely we in Great Britain need not be overwhelmed by them now?

One cannot help feeling that even the staunchest supporters of B.C.G. have been too much impressed by the critics and too much on the defensive. At the same time it should be made clear that I do not expect B.C.G. to produce such striking results as those obtained with some other immunological procedures, and there are limits to its usefulness. Medlar (1948) has rightly remarked that although it is of value in reducing the severity of primary tuberculosis and the progressive tuberculosis that develops soon after primary tuberculosis in young adults, its effect on tuberculosis of the "reinfection" type in older persons must be less. But if one belongs to the "endogenous" school one must assume that anything which reduces the severity of the primary lesion will reduce its tendency to exacerbate in later years.

The whole subject of primary infection and reinfection has been fully discussed by Pagel (1948), who showed that phthisis may sometimes develop at an early stage from a primary cavity. Myers (1946a) contended that primary infection is nearly always benign and anything which follows the primary lesion is due to "reinfection" in a dangerously allergic soil; but Malmross (1947) points out that it would be just as reasonable to say that a primary syphilitic lesion is harmless. He cites the evidence that in young adults progressive tuberculosis not uncommonly develops in close connexion with the primary infection, and the evidence that B.C.G. affords considerable protection against this sequence. It is interesting that in a later paper Myers (1947) says that he will be prepared to use B.C.G. when its efficacy is "proved," though he emphasises the good results he has obtained by using fundamental, well-established methods of control.

The Importance of Tuberculosis and Its Eradication from Human Communities

Wilson states that during the whole Prophit survey, which lasted for ten years, only 2 nurses died of tuberculosis, and he seems to imply that the disease is not important in nurses. But the fact that tuberculin-negative nurses, medical students, and young physicians are particularly liable to develop tuberculosis is established beyond dispute (Holm 1941, Topley and Wilson 1946). The *British Medical Journal* (Editorial 1947) notes that in the Prophit survey

> "the number *initially Mantoux-negative* was 452, and of these no fewer than 33 (7%) developed clinical tuberculosis. It is true that only 2 of these nurses had died when the report was written, but 2 had spinal caries, 1 advanced tuberculous laryngitis, and 4 others active pulmonary disease; in the remainder the lesion was stated to be 'arrested,' 'quiescent,' 'healed,' or 'recovered,' but any such description can be only provisional in this Of the originally Mantoux-positive 2120 nurses —a much lower proportion—had developed tube the disease was still active in 14 and 'quiescent' in the number of deaths in this series could be sta or even twenty years hence the picture would different: tuberculosis is a disease which takes a lo to kill. For the same reason the fact that only 1 1740 dies of tuberculosis in the first year of life d present a true picture of the mortality from n acquired at this time."

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Need for a New Sanitary Revolution

Both in the animal and human field, Great Brit led the way in the great sanitary revolution which be about 1850; but when the time came to deal wi tuberculosis much of our energy seems to have fa and the lead was taken by other countries. Veterinar and farmers have now decided that tuberculosis shall b eradicated from the cattle of Great Britain and a well on the road to achieving this in ten to twenty yea time. It would be appropriate if another sanitar revolution could be begun just a hundred years after th first, which would lead to the virtual eradication of hum tuberculosis. The control of the last of the great zymo diseases of man in Great Britain might well be sk of the new social medicine advocated by Ryle. on harbouring tubercle bacilli would then be upon in the same light as a carrier of typhoid se of smallpox.

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[5] It has been suggested elsewhere (Francis 1949) that the total effect of pasteurising milk may be to increase the total mortality from tuberculosis, because alimentary infection acquired from drinking milk is usually mild, and it appears to immunise against the more serious respiratory infection. It does not follow that we should fail to make milk safe: it does follow that more effective methods should be used to protect against human tuberculous infection.

[6] Birkhaug (1948) has pointed out that B.C.G. becomes more, less, important as tuberculosis is controlled.

ognise that there are many difficulties to over- efore this aim is achieved, but it will never be d unless clearly envisaged and worked for. What ired now is not a "statistically satisfactory trial" ., but the imaginative leadership of a campaign ch all weapons—tuberculin-testing, mass radio- , clinical treatment (including chemotherapy), munisation with B.C.G.—will be used in an attempt uce mortality from the most important single f death in Great Britain.

Summary

ork on tuberculosis in cattle shows that the can be controlled over large areas when the ilin test is used as a diagnostic agent and all are concentrated on breaking the chain of n.

he control of human tuberculosis is obviously more complex, because far less control can be over the individual. Though chemotherapy entually come to play an important part, B.C.G. one specific weapon that can now help to reduce mber of infected persons and the severity of new ns.

C.G. has been available for twenty-five years, have done almost no work in Great Britain on ndardisation of the vaccine or methods of using it .

here still appears to be little official enthusiasm use of B.C.G. in Great Britain.

uite different standards of evidence are used when iscussing the value of B.C.G. and when discussing e value of other immunological procedures or of asteurisation.

is stated that there are no properly controlled trials emonstrating the value of the vaccine in man. This atement is unjustified. The suggestion that civilised ces will not respond to B.C.G. as well as native races spond also has little foundation: indeed the reverse more probably correct.

here is abundant evidence that B.C.G. increases ce to tuberculosis in experimental animals, and creased resistance is for all practical purposes ted with the development of allergy. An allergic e is the criterion of successful B.C.G. immunisation, ere are very good reasons for regarding allergy munised persons as direct practical proof of ed resistance.

here seems to be no justification for withholding vaccine from people who want to use it or for g tuberculin-negative girls to tuberculous patients er to obtain statistically satisfactory evidence of ue. The evidence supporting the use of B.C.G. dy better than the evidence supporting any other ological procedure in man. Data collected in indicate that B.C.G. may cause a fivefold reduction morbidity and mortality of tuberculosis, which be well worth achieving if only for the ny it would mean in surgical and sanatorium ent.

eterinarians and farmers have decided that bovine ulosis shall be eradicated in ten to twenty years. n tuberculosis remains the most important single of death in this country. What is required t so much an "adequate trial" of B.C.G., campaign which will begin a new "sanitary tion" and control of the last of the great ic diseases in Great Britain.

References at foot of next column

SEQUELÆ OF INFECTIVE HEPATITIS IN CHILDREN

REVIEW OF TWELVE CASES

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MANY recent reports have drawn attention to the relatively high incidence of cirrhosis following infective hepatitis among adults, especially troops, during the war years. Records of chronic hepatic damage, possibly leading to a fatal termination, among children are scarce. The power of hepatic regeneration may be greater in childhood than in adult life, yet the present series of cases with sequelæ is composed of twelve children aged $3^1/_2$–12 years; all except one were seen between 1942 and 1945, and six died.

Epidemics of infective hepatitis chiefly affecting children have been recorded, in this country, by Pickles (1930), Glover and Wilson (1931), Montford (1934), and Frazer (1935). There were no fatalities, and apparently all recoveries were complete, though Pickles mentions one patient who did not recover for two months. Commenting on these, Barber (1937) remarked that infective hepatitis was most infectious to children, the majority of whom recovered completely, but that "these apparently simple cases of jaundice should be treated

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of the individual (apart from diagnosis) or to the treatment of tuberculosis. have studied the living animal community—the problems of infection and control—and they have eradicated tuberculosis from many thousands of herds.

Wilson believes in pasteurising milk because he believes it will prevent about 40% of the mortality from tuberculosis in infants.[5] Yet, even when he assumes for the purpose of argument that B.C.G. does afford some measure of protection, he doubts whether it is worth using, and puts forward seven points of difficulty against its adoption. These points have already been met by Wallgren, and since the difficulties were overcome in Norway during enemy occupation, surely we in Great Britain need not be overwhelmed by them now?

One cannot help feeling that even the staunchest supporters of B.C.G. have been too much impressed by the critics and too much on the defensive. At the same time it should be made clear that I do not expect B.C.G. to produce such striking results as those obtained with some other immunological procedures, and there are limits to its usefulness. Medlar (1948) has rightly remarked that although it is of value in reducing the severity of primary tuberculosis and the progressive tuberculosis that develops soon after primary tuberculosis in young adults, its effect on tuberculosis of the "reinfection" type in older persons must be less. But if one belongs to the "endogenous" school one must assume that anything which reduces the severity of the primary lesion will reduce its tendency to exacerbate in later years.

The whole subject of primary infection and reinfection has been fully discussed by Pagel (1948), who showed that phthisis may sometimes develop at an early stage from a primary cavity. Myers (1946a) contended that primary infection is nearly always benign and anything which follows the primary lesion is due to "reinfection" in a dangerously allergic soil; but Malmross (1947) points out that it would be just as reasonable to say that a primary syphilitic lesion is harmless. He cites the evidence that in young adults progressive tuberculosis not uncommonly develops in close connexion with the primary infection, and the evidence that B.C.G. affords considerable protection against this sequence. It is interesting that in a later paper Myers (1947) says that he will be prepared to use B.C.G. when its efficacy is "proved," though he emphasises the good results he has obtained by using fundamental, well-established methods of control.

The Importance of Tuberculosis and Its Eradication from Human Communities

Wilson states that during the whole Prophit survey, which lasted for ten years, only 2 nurses died of tuberculosis, and he seems to imply that the disease is not important in nurses. But the fact that tuberculin-negative nurses, medical students, and young physicians are particularly liable to develop tuberculosis is established beyond dispute (Holm 1941, Topley and Wilson 1946). The *British Medical Journal* (Editorial 1947) notes that in the Prophit survey

> "the number initially Mantoux-negative was 452, and of these no fewer than 33 (7%) developed clinical tuberculosis. It is true that only 2 of these nurses had died when the report was written, but 2 had spinal caries, 1 advanced tuberculous laryngitis, and 4 others active pulmonary disease; in the remainder the lesion was stated to be 'arrested,' 'quiescent,' 'healed,' or 'recovered,' but any such description can be only provisional in this Of the originally Mantoux-positive 2120 nurses —a much lower proportion—had developed tu the disease was still active in 14 and 'quiescent' in the number of deaths in this series could be sta or even twenty years hence the picture would different: tuberculosis is a disease which takes a lo to kill. For the same reason the fact that only 1 1740 dies of tuberculosis in the first year of life d present a true picture of the mortality from acquired at this time."

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DELAYED RECOVERY

7.—A girl aged 6 years in April, 1943, when first seen, eptember, 1942, been off her food and sick, and had jaundiced at the end of about a week. She had d but subsequently had recurrent attacks of nausea, e, and sometimes a yellow colour lasting for 2–3 Her urine contained bile. The edge of her liver three finger-breadths below the costal margin; her as not palpable: she was apparently in good health: m-bilirubin level was 0·6 mg. per 100 ml., and a reaction was strongly positive. In June, 1943, was clinically normal, and her Takata ±.

8.—A girl, aged 3 years, had vomiting, abdominal d dark urine, and became jaundiced for 2 weeks in 1942. Intermittent bouts of abdominal upset d. She was again jaundiced in May, 1946, and had r relapse in June. The symptoms all disappeared. December, 1946, her liver was "only just palpable." en was not felt, and the child appeared to be in good

possible that some cirrhosis may be present, in clinical and biochemical recovery, in cases 7 and 8.

COMPENSATED CIRRHOSIS

9.—A boy, aged 5 years, was first seen on Jan. 20, ith 10 days' history of malaise, frequent vomiting, ndice, dark urine, pale stools, one hæmatemesis, and staxis. After admission his temperature ranged to 103°F for a fortnight. He was drowsy and had y reddish-purple rash on his arms and face for 4 days. r and spleen were both firm and enlarged. He had contact with infective hepatitis at school. He had able anæmia: Hb 56%, red cells 3,600,000 per c.mm. dice lasted 3 weeks, but the liver and spleen were still l enlarged when the patient was discharged home in 43.

s readmitted subsequently five times up to January, ith bouts of vomiting and diarrhœa, or headache, s, and hæmatemesis, or pyrexia and abdominal Latterly the liver was recorded as "small" and the s just palpable. The patient has subsequently gone ica and is said to be in good health.

10.—A boy, aged 2½ years when first he became d in September, 1944, had had a normal infancy. ls were pale, urine dark, liver enlarged down to the s, and spleen palpable. The jaundice disappeared, Takata-Ara test was strongly positive in October, n December, 1944, the patient had a relapse, with ance of jaundice for a short time. On subsequent tions up to December, 1948, his liver and spleen were n and enlarged; he has had occasional epistaxes aid to be lively and well. A Takata reaction on 1948, was negative.

11.—A girl, aged 10 years, first seen in 1943, had had t attacks of abdominal pains associated with vomiting e stools for 5 years. She was slightly jaundiced and ow conjunctivæ; her urine contained bile. After a eal she had considerable abdominal pain. A chole- m was negative. The edge of her liver was not felt, derness was present in her right hypochrondrium. rum-bilirubin level was 3·2 mg. per 100 ml.; it ed to 1 mg. per 100 ml., and the jaundice disappeared. ata reaction changed from + + to ±. Since leaving the patient has not been traced.

SEQUEL IN A POSSIBLE NON-ICTERIC CASE

12.—A girl, aged 6 years, sister to six healthy children, ed in 1943 to be developing considerable enlargement abdomen, the firm rounded edge of her liver being lt, and her spleen palpable on inspiration. Laparotomy n done at another hospital a month before she was e, and "cirrhosis of the liver" had been found out 1½ pints of straw-coloured fluid. There was no d on admission here, and she had never been yellow. ssermann reaction and Mantoux test were negative, e Takata-Ara + +. Since discharge the child s well, and was last seen on Jan. 10, 1949, when her liver was enlarged and hard, the tip of her spleen palpable, and the Takata reaction ±.

The condition in cases 6 and 12, both with non-icteric onset, can, we think, be related tentatively to a preceding attack of subclinical infective hepatitis.

DISCUSSION

In our cases of compensated cirrhosis we have been unable to obtain serial estimations of the indirect van den Bergh and other tests of hepatic function. Altschule and Gilligan (1944) found some residual enlargement of the liver and a raised serum-bilirubin level in nine of thirty-six unselected patients examined 1–29 years after acute infective hepatitis.

As regards prognosis, we have found no means of telling, during the initial illness, whether an individual patient is going to do well or badly. Biochemical tests of liver function have not been found to help in this respect. This is in accordance with Sherlock's (1948) findings, though Roholm and Iversen (1939) have found that a strongly positive Takata-Ara reaction early in the disease is of some significance.

The clinical picture, again, gives no indication of the outcome. In all but two cases nausea, vomiting, or abdominal pain preceded the jaundice. In case 1 the jaundice preceded the intestinal symptoms by some days, but this has not been so in the other reported cases of acute yellow atrophy in infective hepatitis. In case 10 also the jaundice came first.

Ascites, though indicating severe liver damage, is not necessarily associated with a fatal outcome. It occurred in three fatal cases and one non-fatal case in this series. Other cases of recovery following ascites are reported (Sherlock 1948). Lucke (1944) reports its occurrence in the final phase of two-thirds of his series of 125 fatal cases.

It is not clear why ascites develops. Cullinan (1936) assumes that it is due to portal obstruction, since some patients also had melæna and hæmatemesis. This does not seem to be the entire explanation, since it occurs in the absence of other obstructive signs. Lucke suggests that it may also be due to a change in the plasma-proteins or to interference with the water-storage capacity of the liver. Fearnley's (1947) case is interesting in that the ascites was reduced by giving intravenous plasma-protein, even after the serum-protein level had been restored to 7 g. per 100 ml.

SUMMARY

The relation of chronic hepatic damage to infective hepatitis in children is discussed.

Twelve cases of infective hepatitis are reported, six of them fatal, to illustrate the possible sequels.

There is apparently no means of telling, in the initial attacks of jaundice, which patient will recover and which will not.

We acknowledge our thanks to Dr. W. W. Payne for his help in the biochemical studies.

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with respect." In the past, death in childhood from infective hepatitis has been rare. One case, in a girl aged 11 years, is described by Morgan and Brown (1927), and another, in a girl aged $3^{1}/_{2}$ years, by Findlay and Dunlop (1932). Both of these showed acute yellow atrophy. There is some evidence that in recent years the virulence of infective hepatitis has increased, possibly aided by amino-acid deficiencies in war-time diet (see Himsworth and Glynn 1944) and by mixing and concentration of groups of the population. THE LANCET (1948), discussing the sequels, puts the case-mortality of epidemic jaundice at about 1 in 500, possibly higher, and reaffirms that it is a condition never to be taken lightly.

It seems to be possible for chronic liver damage to follow non-icteric attacks of infective hepatitis (Lawrence 1946, Kelsall et al. 1947). The apparent clinical severity of the initial attack certainly bears no relation to the likelihood of sequelæ.

It has been established by aspiration biopsies (Roholm and Iversen 1939, Dible et al. 1943) that the primary lesions of infective hepatitis are periportal cellular infiltration and hepatic-cell degeneration or necrosis beginning in the centre of the lobule. In severe cases, widespread necrosis or yellow atrophy occurring early may end fatally or may be compensated for by multiple nodular hyperplasia. In such cases a later decompensation may terminate in a recurrence of acute or subacute necrosis.

The late effects, based on Sherlock's (1948) aspiration biopsy and necropsy material and on the necropsy findings of Lucke (1944) and Cullinan (1936), may be graded as follows:

(1) Complete restoration of the hepatic lobule, provided its reticulin framework is undamaged.

(2) Periportal (zonal) fibrotic scarring, which usually disappears or may be progressive.

(3) A fine diffuse portal cirrhosis, which may be obstructive, leading to gastric or œsophageal hæmorrhages.

(4) Multiple nodular hyperplasia replacing massive necrosis.

(5) Acute or subacute liver necrosis ending in one of the chronic forms.

According to Lucke (1944), histological signs of regeneration begin to appear about the tenth day of the illness, and it is interesting that, in the patient dying of acute yellow atrophy in whom there was no attempt at repair, it was at about this time that clinical deterioration set in.

FATAL CASES

In the six fatal cases of our series the symptoms lasted from 11 days to 5 years. The liver in the case of the shortest duration showed acute yellow atrophy. Subacute necrosis, with multiple nodular hyperplasia, was the feature of cases of longer duration. The classical portal type of cirrhosis was not seen in this series (cf., Sherlock 1948).

Case 1.—A boy, aged $3^{1}/_{2}$ years, had an illness lasting 11 days, in which he was jaundiced and had malaise, vomiting, dark urine, and pale stools. On the ninth day he had intermittent bouts of abdominal pain and became comatose and restless, with exaggeration of tendon-reflexes and extensor plantar reflexes. His abdomen became grossly distended, and he had a hæmatemesis a few hours before death.

Necropsy.—The liver was much smaller than normal for the boy's age, and weighed 390 g. The cut surface had a yellowish-pink ground-glass appearance. Histologically there was acute hepatic necrosis without signs of nodular regeneration.

The patient's elder brother had had a bilious attack, with light stools and dark urine, $4^{1}/_{2}$ weeks before the onset of the patient's illness.

Case 2.—A boy, aged 7 years, had a history of vomiting and dark urine, 8 weeks before death, followed in a week by jaundice and pale stools but no loss of appetite. His liver was tender and reached four finger-breadths below the costal margin, and the tip of his spleen was palpable. His terminal state was characterised by vomiting, inability to see clearly, restlessness passing into coma, neck rigidity, ex plantar reflexes, sudden decrease in the size of the liver final hæmatemesis.

Necropsy.—The liver was small, with well-marked su liver atrophy, and there were multiple hæmorrhages lungs and mesentery.

Case 3.—A boy, aged 11 years, had an illness last weeks, starting with sickness and malaise, and succeed jaundice, after which he felt well in himself for a time, e for some epistaxes and muscular pains in the first fort of his illness. In the fourth week his abdomen became distended, with prominence of the superficial veins, marked ascites, and œdema of the abdominal wall and the liver and spleen could not be palpated. Parace was done four times, with removal of 54, 60, 200, and 2 The boy felt comfortable and ate well, but in the eighth of illness he became deeply jaundiced and his tempe rose gradually. There were no terminal cerebral signs.

Necropsy.—The liver weighed 720 g. and showed a irregular surface; on section there were irregular nodu olive-green tissue and microscopy showed multiple no hyperplasia, with terminal necrosis.

Case 4.—A boy, aged 10 years, had had an attack jaundice 10 weeks previously, with a rash resembling rub nausea, sickness for a week before the appearance of jaund dark urine, and pale stools. He had not been free f jaundice since but had improved and then relapsed. He bruising and petechiæ for a week and bleeding from g in the last 2 days. Liver and spleen were impalpable. T was terminal intracranial hæmorrhage. The serum-bilru level was 2 mg. per 100 ml.

Necropsy.—The liver weighed 1030 g., was moderat firm, and showed multiple nodular hyperplasia and subac necrosis.

Case 5.—A boy, aged $12^{1}/_{2}$ years, had had, at the age 7 years, an attack of jaundice which had lasted 17 we and been followed by recurrent attacks of abdominal pain jaundice and by profuse melæna on three occasions. liver had a hard edge, felt at the costal margin; his spleen grossly enlarged down to the level of the umbilicus; he had ascites and telangiectasia on his face and trunk. serum-bilirubin level was 10·4 mg. per 100 ml. He had termin epistaxis, melæna, spasticity of limbs, and coma.

Necropsy.—His liver weighed 1140 g. and was coars nodular, the nodules being bile-stained and the interven fibrotic tissue pink. His spleen weighed 1000 g. The li on section showed a late stage of subacute necros No varicosities were found; hæmorrhage was due hypoprothrombinæmia.

The next case is an example of multiple nodular hyp plasia with terminal necrosis, possibly following a s clinical hepatitis. It is included because the patholog findings were similar to those in the preceding cases.

Case 6.—A boy, aged 8 years, had been in good he up to July, 1948, when he developed abdominal pains, pall and temperature for a few days. Since then he had be unwell, lost half a stone in weight, and passed pale stoo on several occasions. He had had frequent epistaxes fo 12 months.

When first seen in September, 1948, he presented icter conjunctivæ; protuberant abdomen, with free fluid demo strable; liver firm and hard; liver and spleen both extendin three finger-breadths below the costal margin; and spid nævi on wrists, knees, and trunk. The serum-bilirubin lev was 3·7 mg. per 100 ml. Paracentesis abdominalis was required twice. A liver biopsy by laparotomy showed a tawny coloured hobnailed liver. Microscopically areas both o necrosis and of multiple nodular hyperplasia were present.

On Nov. 25, 1948, the jaundice greatly increased, the temperature rose to 103°F, œdema spread to sacrum and ankles, and the patient became drowsy, vomited altered blood, and died. The duration of the hepatic symptoms was 5 months or more but difficult to assess, because the onset was non-icteric.

This case closely resembles one of Cullinan's (1936), a boy, aged 12 years, who first had jaundice on the d before his death, but whose liver at necropsy showed cirrhosis and long-standing nodules.

The remaining six cases demonstrate in children three possible forms of sequelæ following infective hepatitis:

tients (51 alive and 40 dead) in whom the diagnosis sseminated sclerosis was confirmed were a biased le. For both series (the 91 cases used and the 54 followed up) information was available, with few tions, about sex, type of illness, and age at onset. stical comparisons were made between the two series ms of the distribution of each of these known facts, the results of these comparisons in no way suggest the differences between the used cases and the unused were greater than could easily have arisen by ce:

Sex-distribution: $\chi^2=0{\cdot}39$ D.F.=1 $0{\cdot}7>P>0{\cdot}5$.

Symptomatic distribution: $\chi^2=0{\cdot}13$ D.F.=1 $0{\cdot}8>P>0{\cdot}7$.

Distribution of monosymptomatic onsets as "motor" or al": $\chi^2=0{\cdot}17$ D.F.=1 $0{\cdot}9>P>0{\cdot}8$.

Age-at-onset distribution: $\chi^2=6{\cdot}93$ D.F.=5 $0{\cdot}3>P>0{\cdot}2$.

PROGNOSIS

e prognosis in disseminated sclerosis is generally idered to be uniformly bad, though Birley and geon (1921) and Heine (1936) state that the possi- y of a spontaneous cure cannot entirely be denied, Symonds (1948) has necropsy evidence of such a

> his patient died of pneumonia in her sixties. During he only evidence of a neurological condition was extensor ar reflexes. At necropsy scattered lesions of disseminated sis were found. Subsequent inquiry revealed that in her ties she had had fluctuating weakness of her legs, which tually improved, leaving her slightly lame but not venting her from leading an active life. There were no er symptoms of organic disease.

LE II—PROBABILITY OF SURVIVAL ACCORDING TO TYPE OF ONSET AND SEX

ars m et	Probability of surviving from onset to end of period shown					
	Males		Females		All cases	
	Mono-symptomatic	Poly-symptomatic	Mono-symptomatic	Poly-symptomatic	Mono-symptomatic	Poly-symptomatic
-4	0·91	0·89	1·00	0·88	0·95	0·89
5-9	0·84	0·76	0·91	0·76	0·87	0·76
-14	0·70	0·62	0·68	0·54	0·69	0·58
5-19	0·64	0·45	0·56	0·43	0·60	0·44
-24	0·26	0·30	0·56	0·29	0·34	0·29

rley and Dudgeon (1921) emphasised the better prognosis in the remittent type compared with the chronic ressive type of disseminated sclerosis. Brain (1936) shown that the acute extensive disease of young ts has a poor prognosis, the chronic spinal form of ddle age a better, and the remitting form the best gnosis. In cases with unilateral retrobulbar neuritis, in the absence of other symptoms and signs, it is sonable to hope that there will be a remission lasting ew, or possibly many, years. Similar observations were de by McIntyre and McIntyre (1943).

Symonds (1930) found that 28% of 139 patients had trobulbar neuritis as a *first symptom, and 15% as an* ly symptom. In 20 of these the next symptom veloped in less than two years, in 5 in less than five ars, and in 5 in more than five years.

Brown and Putnam (1939) have shown that symptoms e to small lesions, such as diplopia, central scotoma, d sensory disturbances of one extremity, tend to gress within a few months, whereas symptoms due to ge lesions, such as paraplegia, ataxia, and mental terioration, are usually permanent. First symptoms ve a higher rate of recovery than the same symptoms veloping later. Thysgesen (1947) states that the ognosis is unfavourable when optic-nerve symptoms pear early in the disease in association with other symptoms, and when disturbances of coördination appear in the initial stages.

TABLE III—TYPE OF ONSET ACCORDING TO AGE AT ONSET

Type of onset	Age at onset (yr.)										
	10–	15–	20–	25–	30–	35–	40–	45–	50–	Unknown	All ages
Monosymptomatic	2	5	10	10	9	10	8	—	—	2	56
Polysymptomatic	—	5	9	9	4	3	4	—	1	—	35
Total ..	2	10	19	19	13	13	12	—	1	2	91

The case-records of the 51 living and 40 dead patients of the present series were analysed. The onsets of the disease were divided into two categories: monosymptomatic and polysymptomatic. From a pathological point of view this is an artificial division, since it probably requires more plaques to produce symptoms in the long tracts, such as the pyramidal tracts, than in the short tracts, such as the optic nerves and posterior longitudinal bundles. Also it was difficult to be certain in what category some types of onset should be placed. Subjective symptoms, such as paræsthesiæ of the legs, where the lesion is in adjacent posterior columns, were labelled monosymptomatic, whereas weakness of both legs was called polysymptomatic because, both pyramidal tracts being involved, it required two plaques or more, or possibly one large plaque. Hence, as a rule, the case was labelled polysymptomatic when the symptoms were bilateral, except in the case of paræsthesiæ, and monosymptomatic when unilateral—e.g., in hemiparesis and monoparesis. An onset with weakness and paræsthesiæ of one limb was called monosymptomatic but was not included in the motor type of onset (see below).

Table I shows the sex-distribution of monosymptomatic and polysymptomatic onsets. Since 51 patients are still living, their ultimate prognosis is unknown. However, the living patients can be used in conjunction with the dead to give better estimates of survival-rates at certain periods after onset through which they have been exposed than could be obtained by use of the dead patients alone. The duration of the disease has been considered here in five-year periods and the technique used is set out in detail in the appendix.

From table II it will be seen that, except for males between 20 and 24 years from onset, the probability of survival is consistently less for the polysymptomatic group than for the monosymptomatic. Otherwise the figures for males and females are very similar. This is surprising, since in view of the effects of pregnancy on disseminated sclerosis, the prognosis would have been expected to be better in males. Four women in the series passed through pregnancies without adverse effect, including one who successfully weathered four pregnancies during a long remission. In 2 cases, however, the onset was precipitated by, or related to, childbirth.

Table III shows that the age of onset in the two groups, monosymptomatic and polysymptomatic, is somewhat different. Therefore the data have been divided into two groups according to the age (less than 25 and 25 or more) at onset, to see whether or not the differences in chance of survival are a function of age rather than of type of onset. Table IV shows that in each age-group the probability of survival up to 19 years after onset is consistently less for the patients with a polysymptomatic onset. Only in the patients aged up to 24 at onset is the probability of survival to 20–24 years from onset lower in the patients with a monosymptomatic onset and there were too few patients in this group for the findings to carry much conviction.

On the whole, then, the prognosis is less favourable for patients with polysymptomatic than with monosympto-

DI-ISOPROPYL FLUOROPHOSPHONATE AS AN INTESTINAL CARMINATIVE

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In a clinical study of postoperative adynamic ileus Quilliam and Quilliam[1] commented favourably on di-isopropyl fluorophosphonate (D.F.P.), but they emphasised that it should be used only as part of the general management of such cases. The fact that the clinician is often obliged to adopt several different forms of treatment simultaneously obscures the part played by these measures individually. We have therefore investigated the carminative value of D.F.P. alone and in conjunction with posterior pituitary extract (P.P.E.). The D.F.P. was dispensed in arachis oil, and the dose was injected intramuscularly, equally divided between two sites to promote rapid absorption.

METHOD

The method of assessment used was that of Alstead and Patterson.[2] Observations were made on 23 patients. The intestinal gases were collected in a measuring cylinder with a rectal catheter. During a control period of two hours no drugs were given and nothing was taken by mouth. The patient then received his midday meal, and the postprandial output of flatus was noted. About two hours after the meal D.F.P. was injected intramuscularly, and the experiment was continued for a further two or three hours.

Twelve patients received D.F.P. alone, 3 of them receiving 2 mg. and the remainder 4 mg. Six patients received 4 mg. of D.F.P. and 3 units of P.P.E. simultaneously In addition 5 patients were given 4 mg. of D.F.P. followed by 2 units of P.P.E. thirty, sixty, and ninety minutes later, in order to maintain the effect of P.P.E. during the period of greatest activity of D.F.P.

RESULTS

A postprandial evacuation of gas was recorded in 13 of the 23 patients (56%). In 3 of the 12 patients given D.F.P. alone a smart carminative action was observed (450 ml., 330 ml., and 340 ml.). A smaller response was given by 3 other patients (180 ml., 105 ml., and 80 ml.). The response to D.F.P. was most striking in those patients who had already produced large postprandial evacuations of flatus. The action of D.F.P. was apparent in some cases a few minutes after administration and continued in others for at least two and a half hours. When D.F.P. and P.P.E. were given simultaneously, an early response occurred in 5 out of 6 patients and this was attributed to the action of the pressor principle in the P.P.E. A delayed action was explained by the relatively slow-acting D.F.P. and occurred in only 3 out of 6 patients. When small divided doses of P.P.E. were substituted for the single dose, 3 out of 5 patients showed a considerable response (150 ml., 280 ml., and 380 ml.), but it was no greater than the response of other patients to D.F.P. alone.

None of the 12 patients given D.F.P. alone showed any untoward effects. Of the 11 patients given D.F.P. and P.P.E., 2 developed severe reactions, with vomiting, colic, and frontal headache, and 3 other patients had similar but less severe symptoms. These troublesome side-effects occurred irrespective of whether the drugs were given together or spaced out as described above.

SUMMARY

Tested by its capacity to remove gas from the di-isopropyl fluorophosphonate was more or less in 12 out of 23 patients and produced no si

When this drug was given with posterior extract, no useful synergistic action occurred but effects were frequent and sometimes distressing.

We wish to thank Prof. Stanley Alstead for help advice in this work and Dr. A. D. Briggs, the medical tendent, for permission to publish the results. We indebted to Messrs. Allen & Hanburys Ltd., for of D.F.P.

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DISSEMINATED SCLEROSIS

A FOLLOW-UP OF 91 CASES

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The object of this follow-up was to discover the of patients in 1947 who had been diagnosed in 193 as having disseminated sclerosis. Most of them had investigated in hospital on at least one occasion. I tried to compare the prognosis of cases with types of onset and to consider familial aspects of disease and its possible association with the disease growing lambs known as swayback.

The material was drawn mainly from the re 137 patients examined in the Royal Victoria H Belfast, and of 25 in one consulting practice. W was found that there was great difficulty in tracing ma patients, 7 seen in other hospitals were included. Of the 169 patients, 121 were traced; 74 were alive and had died. Of the 74 alive, 6 either refused examinatio or could not be visited. Of the 68 examined, 51 confirmed as having disseminated sclerosis, 7 were uncertain diagnosis, and 10 were considered in 1947 be probably not cases of disseminated sclerosis. Of t 47 dead, after careful study of all available record including death certificates, 40 were considered to ha had disseminating sclerosis and 7 probably not. D seminated sclerosis was not mentioned in the dea certificates of 4 patients for whom the diagnosis was ver clear from the clinical records.

Of the 10 living patients who were probably n suffering from disseminated sclerosis 4 showed neith symptoms nor signs of any disease (they may possib have been enjoying long remissions), and 1 had angioma of the cervical cord (confirmed at operatio To the remaining 5 it was difficult to attach a satisfacto diagnosis: 1 of them showed definite signs of moto neurone disease of only a few years' duration, but seems unlikely that the symptoms on which disseminat sclerosis had been diagnosed could have any connexi with his present condition.

If the 54 patients who could not be followed up in 19 had disseminated sclerosis and were not available fo re-examination because they had died between 1937 an 1947, then the results of my investigation may b invalid. On the other hand, there is no evidence that th

TABLE I—SEX-DISTRIBUTION OF TYPES OF ONSET

Sex	Onset						Total		
	Monosymptomatic			Polysymptomatic					
	No. of patients								
	Alive	Dead	Total	Alive	Dead	Total	Alive	Dead	Total
Male ..	20	12	32	9	9	18	29	21	50
Female	15	9	24	7	10	17	22	19	41

CONTACT WITH SHEEP

w of recent work on swayback and its possible on with disseminated sclerosis, nearly all the interviewed were asked whether they had ever close contact with sheep or lambs. It had been plot the residence of the patients at the onset isease on a map showing the incidence of sway-Northern Ireland. The Ministry of Agriculture thern Ireland states, however, that there has evidence of swayback in the country, either r during this investigation. In 11 cases out of 49 s evidence of close contact with sheep or lambs ; compares with the incidence of the contact of eings with these animals in the general popula-nknown. One of the patients was working with Australia when his first symptoms came on.

SUMMARY

-one cases of disseminated sclerosis were to show the probability of survival at different after onset of the disease.

sults suggest that patients with a monosymp-onset have a better prognosis than those with a ptomatic onset ; patients with an onset with mptoms have a better prognosis than those with ymptoms ; and patients whose first symptoms efore they are 25 have a better prognosis than h a later onset.

out of eighty-nine families showed a disease like ated sclerosis in more than one member.

ack has so far not been reported among lambs ern Ireland. This is of interest in view of the ion by Coates (1930) that disseminated sclerosis nore common in this country than in other parts ritish Isles.

o thank the physicians of the Royal Victoria Hospital, or permission to use their cases ; Dr. R. S. Allison couragement, help, and stimulation ; Dr. J. Knowel-e London School of Hygiene and Tropical Medicine of the statistical work, and Dr. E. A. Cheeseman, partment of Social and Preventive Medicine, Queens y, Belfast, for the rest of the statistical work.

APPENDIX

Calculating Chances of Survival

ject is to compare the probabilities of survival of ps of patients at certain periods of duration of se—e.g., monosymptomatic with polysymptomatic one age of onset group with another, males with kc.

ta are available either as lengths of survival after 947 in the case of patients alive in 1947, or duration er onset in the case of patients who died before 1947. following explanation the data are grouped in five-ods after onset—i.e., 0–4, 5–9, 10–14, 15–19, and ars, indicated by the subscript 0, 1, 2, 3, and 4 ly, and in general by the subscript x.

presents the number of patients exposed in period x. he number of deaths in the same period, then :

of patients alive in 1947 and observed to the end of period x) $+ (d_x + d_{x+1} + d_{x+2} \dots .)$

hance of surviving period x is $1 - \frac{d_x}{P_x}$ or p_x.

x for each five-year period is an independent estimate ance of surviving period x based on the greatest f available data ; and the chance of surviving from the end of any given period, say t, is :

$$p_0 \times p_1 \times p_2 \times \dots \dots p_t$$

l Example

ulate the chance of survival from onset to 10 years—e end of the second period (data of males and females l with monosymptomatic onset) :

	Period 0–4 yr. (x=0)	*Period 5–9 yr.* (x=1)
atients alive in erred to end of	35	34
No. of deaths in period x and subsequent periods	$d_0 + d_1 + d_2 + d_3 + d_4 = 21$	$d_1 + d_2 + d_3 + d_4 = 18$
No. of patients exposed in period x	$P_0 = 35 + 21 = 56$	$P_1 = 34 + 18 = 52$
No. of deaths in period x	$d_0 = 3$	$d_1 = 4$
Chance of surviving period x	$\left(1 - \frac{d_0}{P_0}\right) = \left(1 - \frac{3}{56}\right) = 0{\cdot}95$	$\left(1 - \frac{d_1}{P_1}\right) = \left(1 - \frac{4}{52}\right) = 0{\cdot}92$

∴ Chance of surviving from onset to end of second period—i.e., 10 years after onset—is $p_0 \times p_1 = 0{\cdot}95 \times 0{\cdot}92 = 0{\cdot}87$.

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EXPERIMENTAL TYPHOID INFECTION TREATED WITH CHLOROMYCETIN AND SULPHADIAZINE

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Preliminary reports on the treatment of typhoid fever with chloromycetin indicate that this drug usually causes rapid subsidence of fever and a corresponding symptomatic improvement (Woodward et al. 1948, Murgatroyd 1949, Bradley 1949) ; but treatment has to be continued for at least 8 days, and the relapse-rate is high. El Ramli (1949) has found that of 17 patients treated with chloromycetin 9 (53%) relapsed, compared with 16 (13%) of 122 untreated controls ; he has also found that, in the doses used, chloromycetin gave rise to some toxic manifestations, of which the commonest were anorexia, stomatitis, glossitis, skin rashes, and mental apathy.

A synergistic action between penicillin and sulphonamide compounds on *Salmonella typhi* was first reported by Bigger (1946), and advantage has been taken of this phenomenon in treating typhoid fever (Comerford et al.

TABLE I—AVERAGE SURVIVAL PERIODS IN DIFFERENT GROUPS OF MICE TREATED WITH CHLOROMYCETIN BY VARIOUS DOSAGE SCHEMES

Chloromycetin, dose (mg.)	Dose given at time of infection		Dose given three times at 3-hourly intervals	
	No. of mice	Average survival period (days) after death of all controls	No. of mice	Average survival period (days) after death of all controls
8	18	5·7	12	7·0
4	18	2·7	12	6·4
2	12	2·0	12	4·5
1	12	0·25	12	1·4
0	36	..	18	..

matic onsets. It must be emphasised that, though the results of statistical analysis are uniformly suggestive in this respect, no significant differences were obtained in this small series. However, in general the findings agree with clinical impressions. One finding not in general agreement with clinical impression is that patients whose symptoms appear before the age of 25 have a better prognosis that those with a later onset. But some of the older patients may have forgotten a symptom earlier in life which would either have placed them in the younger category or given better figures for their own group.

Müller (1949), who investigated the symptomatology, course, and prognosis in 810 cases, found that the probability of surviving different five-year periods after the onset was greater in each successive period. He too showed that an onset after the age of 25 years carried a worse prognosis than under 25, and that there was little to choose in outlook where the sex of the patient was concerned. He calculated that the average duration of illness for disseminated sclerosis lay between 16 and 34 years.

In table v the monosymptomatic patients have been divided into two groups; 19 with a visual onset (amblyopia and diplopia), and 17 with a motor onset (weakness of a hemiplegic distribution or weakness of an arm or leg without subjective sensory symptoms). Since there was little difference in sex and age distribution between the groups they have not been further divided. The "visual" group have better probabilities of survival than the "motor" group, and the differences between "visual" and "motor" at any period are greater than the corresponding differences between monosymptomatic and polysymptomatic groups. This might be expected from clinical experience, but the comparison is not entirely justifiable, since it probably requires several lesions at different levels to interrupt functional motor activity, whereas a solitary lesion in the optic nerve will cause transient impairment of vision. Müller (1949) showed that in his large series the prognosis was more favourable for sensory and cranial-nerve disturbances than for motor and sphincter disorders. Also, when motor disorders were an initial symptom there was a greater likelihood that the disease would be progressive, and this risk was greater with increasing age.

TABLE IV—PROBABILITY OF SURVIVAL ACCORDING TO AGE AT ONSET

Years from onset	Probability of surviving from onset to end of period shown			
	Onset at 0–24 yr.		Onset at 25 or more yr.	
	Mono-symptomatic	Poly-symptomatic	Mono-symptomatic	Poly-symptomatic
0–4	1·00	0·93	0·92	0·86
5–9	0·94	0·79	0·84	0·75
10–14	0·80	0·71	0·65	0·48
15–19	0·71	0·62	0·55	0·24
20–24	0·35	0·50	0·55	0·00

FAMILIAL INCIDENCE

Disseminated sclerosis can be closely simulated by many familial diseases of the central nervous system, such as familial ataxias (Hall and Mackay 1937), Schilder's disease (Ferraro 1927, Symonds 1928), hereditary cerebellar disease of Marie, Pelizæus Merzbacher's disease, and others (Ferguson and Critchley 1929). Certainty can only be established by necropsy.

Published reports were found of nine families in which more than one member had disseminated sclerosis verified by necropsy: Ellermann (1935) collected reports of six such families and reported one of his own; and Maier (1947) reported necropsy findings of diss sclerosis in a mother, her son, and her daughter. and Keschner (1943) added a brother and sister necropsy confirmed the diagnosis in one case. Ho in view of the paucity of confirmation by nec the published reports, most writers agree that f disseminated sclerosis is the result more proba chance or a common source of infection than of influences. This attitude is supported by work on Curtius (1933) calculated that there should be 370 with disseminated sclerosis in Germany. Thums (found thirteen pairs of identical twins of whom twin had disseminated sclerosis but the other had he concluded that there was no hereditary in disseminated sclerosis. Twins suffering from di sclerosis, without pathological confirmation, have reported by Legras (1934), Astwazaturow (1935), Williams (1946).

TABLE V—PROBABILITY OF SURVIVAL IN ALL MONOS PATIENTS ACCORDING TO WHETHER THE FIRST WAS MOTOR OR VISUAL

Years from onset	Probability of surviving from onset to end of period shown	
	Motor onset	Visual
0–4	0·94	1·00
5–9	0·78	0·95
10–14	0·57	0·82
15–19	0·45	0·75
20–24	0·00	0·45

In the present series 3 families out of 89 show probable familial incidence:

Case 1.—A male farm labourer, aged 28, with a prog illness which, despite the absence of remissions, cou regarded as disseminated sclerosis, had had a sister who died in a mental hospital at the age of 35 and had been nosed as a "typical case of disseminated sclerosis." She been emotionally unstable, with staccato speech, sp paraplegia, worse in one leg, and absence of abdo reflexes. The colloidal gold reaction of her cerebro fluid had shown a paretic curve associated with a neg Wassermann reaction. There were nine other siblings and healthy, none with any deformity suggesting a fam disease.

Case 2.—A plumber, aged 32, also had a of disseminated sclerosis, but he had a history of retrobulbar neuritis which had lasted a month in year of his illness. His sister, a housewife aged 40, had ness of the legs without any remissions but could be to have disseminated sclerosis. She had a according to her doctor, also seemed to have sclerosis. This daughter had complained in June, paræsthesiæ of the left leg, and had had no abnormal phy signs, except that the knee-jerks had been brisk and plantar reflexes were possibly extensor. Three months the paræsthesiæ had cleared, but she had complaine weakness of the left leg. The plantar reflexes on this occ had been definitely extensor. A few days later she had plained of paræsthesiæ of the fingers. In October, 1946 had had pain in the distribution of the first and se divisions of the left trigeminal nerve and "irritations the left eye. Examination had shown hyperalgesia in distribution, and the plantar reflexes had remained exte A year later all symptoms had cleared, with the pl reflexes still extensor.

Case 3.—A woman, aged 37, had had weakness of the ri leg as the initial symptom, which had varied from time time. This had been followed three years later by trans paræsthesiæ. Her brother, aged 26, had had a more typ history, with initial urinary symptoms leading to retention of urine, followed by weakness and ataxia of the and a recent history of blurring of vision. He had hæmatemesis in 1933. There were nine siblings in the three having had operations for duodenal ulcers, but the six being healthy. Both parents were healthy and li and 82 years.

sputum. No pathogens were isolated from the fæces :.

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ION OF SODA LIME ON CHLOROFORM

H. LLEWELLYN BASSETT

M.A. Camb., B.Sc. Lond.

RER IN ORGANIC CHEMISTRY, UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE

HEN chloroform is brought into contact with alkali, may be, according to the conditions, one of three ts:

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There are substantial reasons for doubting the statement[1] that phosgene may be produced, and in one series of experiments mixtures of chloroform vapour, and oxygen, with and without carbon dioxide and air, were passed through soda lime under very varied conditions. A careful search did not reveal the slightest trace of phosgene.

Though the decomposition of chloroform by alkali is usually represented by equation (2), early though neglected work[1,2] shows beyond question that under appropriate conditions the reaction may chiefly follow the course represented in equation (3). In some experiments more than 90% of the chloroform was converted into carbon monoxide, but very small variations in conditions can alter the course of the reaction to a surprising extent and rather erratically.

RESULTS

In the present experiments it was found that, when mixtures of 2 or 5% chloroform vapour in oxygen were passed through moistened soda lime at 50°C at a rate of 2 or 3 litres a minute—i.e., considerably slower than the mean breathing-rate—about 1% of the chloroform was converted into carbon monoxide at each passage, though there was considerable variation with the rate of flow. Very little formate was produced. No carbon monoxide could be detected when the gas mixture passed rapidly.

Experiment confirmed that the hydrochloric acid and any formic acid produced by the destruction of chloroform under these conditions are completely trapped by the soda lime; hence it is possible to find, with certainty, the amount of decomposition in a given instance by estimating the chloride left in the soda lime at the end of the operation, allowing for any chloride originally present. Moreover, if there had been any material decomposition, an estimation of formate will give, by difference, the quantity of carbon monoxide actually produced.

Dr. Mushin has kindly provided me with three used charges of soda lime from cases where chloroform had been administered as an anæsthetic. The chloride content of all three showed that there had been only very slight decomposition of the chloroform used. The amount of formate in any one charge was too small for a reliable estimation, but the result showed that, even if all the chloroform destroyed had been converted into carbon monoxide, in the worst case some 16 c.cm. of this gas would have been produced over the whole period of the anæsthesia.

SUMMARY

Experiments were conducted to study the action of soda lime on chloroform.

Under the conditions obtaining in a closed-circuit apparatus during the production of anæsthesia little decomposition takes place.

Three specimens of soda lime from clinical cases were examined. No more than 16 c.cm. of carbon monoxide could have been produced in any one case.

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1. Mossler, G. *Mschr. Chemie*, 1908, 29, 597.
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. . . Man is *not* a social animal who has, in some mysterious way, contracted a disease of selfishness, of sloth, and evil sexual desires. These are not due to Satan, Original Sin, Karma, or some incredible rebellion of man against his Maker, they are simply inherited instincts derived from his forbears. . . . We have *only to make one* great yet simple change—assert that man's original state was that of the non social hunter—and all the facts about man marshal themselves afresh, re-orientate themselves, and fit into their true position."—ALFRED MACHIN in *What is Man?* London: C. A. Watts, 1949.

TABLE II

Treatment		No. of mice	Average survival period (days) after death of all controls
Chloromycetin (mg.)	Sulphadiazine (mg.)		
4	..	18	2·7
4	8	12	6·0
2	..	12	2·0
2	8	12	5·2
1	..	12	0·25
1	8	12	3·2
..	8	24	0·12
Nil		42	..

1946, 1947, McSweeney 1946, El Ramli and El Borolossy). This synergism is evident with experimental infections in mice (El Borolossy and Buttle 1949); and the present study, also in mice, was undertaken in order to find out whether similar synergism existed between chloromycetin and the sulphonamides.

The protective action of different doses of chloromycetin in *Salmonella typhi* infection in mice was first investigated.

METHOD

White mice with an average weight of 20 g. were infected with the Rawling strain of *S. typhi* (from the Wellcome Foundation) by intraperitoneal injection of 5×10^8 organisms (10,000 times L.D. 50), suspended in 0·5 ml. of 5% mucin. The drugs were given by mouth suspended in mucilage of tragacanth. In each experiment a control group of infected animals left without treatment all died within twenty-four hours. The number of survivors in each treated group was recorded daily up to seven days. The comparative value of the different forms of treatment was estimated by comparing the average survival periods of the mice in each group, obtained by adding together the number of days survived by each mouse and dividing the sum by the number of mice in the group.

RESULTS

The maximum tolerated dose of chloromycetin in mice is said to be 200 mg. per kg. body-weight (Smith et al. 1948). In our experiments, however, 20 g. mice tolerated a dose of 8 mg.—i.e., 400 mg. per kg. Smith and his colleagues found that chloromycetin is rapidly excreted by mice; and this may mean that the therapeutic response would be better with repeated doses during the first twelve hours following infection than with a single dose at the time of infection. Table I shows clearly that repetition of the treatment increases the survival period.

The effect of sulphadiazine and chloromycetin together was then studied; 8 mg. of sulphadiazine was given with 4, 2, or 1 mg. of chloromycetin, and the average survival period was compared with that after giving chloromycetin alone (table II).

COMMENT

From table II it is evident that sulphadiazine and chloromycetin exerted a synergistic action against *S. typhi* infection; their combined use increased the average survival period by 2·2, 2·6, and 12·8 times when 4, 2, and 1 mg. of chloromycetin was used. A significant correlation between the doses of chloromycetin and the resulting effect has been found, and the regression line was calculated. The doses of mycetin which would produce average survival of 6·0, 5·2, and 3·2 days were then calculated; periods, as will be noted, correspond to the effect of 4, 2, and 1 mg. of chloromycetin when combined with 8 mg. of sulphadiazine (tabl

TABLE III—DOSES OF CHLOROMYCETIN REQUIRED TO PRODUCE AN EQUIVALENT THERAPEUTIC EFFECT WHEN GIVEN ALONE AND WHEN GIVEN WITH SULPHADIAZINE

Average survival period (days) after death of all controls	Chloromycetin, effective dose (mg.)	
	Given alone	Given with 8 mg. sulphadiazine
6·0	6·83	4
5·2	6·14	2
3·2	4·4	1

Table III shows that the effect produced by a dose of chloromycetin *can be obtained by a fr* that dose combined with sulphadiazine; but this sulphadiazine by itself has no appreciable effect.

This phenomenon may prove of clinical value, the following advantages: (1) conservation of mycetin, which is still scarce and expensive in (2) lessened risk of toxic reactions; and (3) *diminution of the high relapse-rate observed in* treated with this drug.

Sulphathiazole is probably preferable to su for use in the human cases.

SUMMARY

The therapeutic effect of chloromycetin in S. infection in mice has been studied.

A synergistic action between chloromyceti sulphadiazine against this infection has been

Possibly treatment with chloromycetin and thiazole together may give satisfactory results in fever.

This work has been undertaken with the grant from the Medical Research Council, made to (G. A. H. B.).

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PERFORATED ENTERIC ULCER

SUCCESSFULLY TREATED CONSERVATIVEL

D. LANG STEVENSON
M.B. Glasg., F.R.C.S.E.
SURGEON, WHIPPS CROSS
HOSPITAL, LONDON, E.11

RICHARD B. WE
M.B. Camb., F
SURGICAL
LIVERPOOL ROYAL

ALL reports agree on the high mortality f perforation of enteric ulcers of the intestine. and Mitchiner[1] give the case-mortality for typhoid ulcers as 70% following operation and without operation. An annotation in THE LANCET[2] that "the complication is very serious, for the dea even after operation is 92–93% and without operat die." In view of these reports the following cas interest.

A soldier, aged 28, was admitted to a Military Hosp April 23, 1946, complaining of three days' headache, and shivering. There were no abnormal physical signs. the next three weeks his temperature varied from 96 to reaching 103·6°F on one occasion, and his pulse-rate from 60 to 100 per min.

On April 25 he complained of abdominal pain, and a rub was heard on the right side. There was a prod cough for some days. No rose spots were seen.

Investigations revealed no malarial parasites in the and blood-culture was sterile. The white-cell coun 5400 per c.mm. on one occasion and 5800 on another differential count was normal. The erythrocyte- rate was 20 mm. in one hour (Westergren). Blood were positive for *S. paratyphi-B* at 1 in 480 on May 5, 1 in 40 on May 14. There was no abnormality in the

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1. Romanis, W. H. C., Mitchiner, P. H. The Science and of Surgery. 7th ed., London, 1941.
2. *Lancet*, 1918, ii, 105.

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The Section of Psychiatry's Symposium

FROM A CORRESPONDENT

PSYCHIATRY of the major psychoses, until fifteen years ago one of the least therapeutically minded branches of medicine, has lately burst out into an afflorescence of physical treatments, some of them purely empirical and without adequate rationale. The trend has been taken up with much vigour in this country by many specialists including neurosurgeons, not always with the necessary discrimination. It was therefore both instructive and corrective to listen to a group of experts from the U.S.A. who, on their way home from the International Neurological Congress in Paris, took part on Sept. 12 and 13 in a two days' symposium arranged by the section of psychiatry of the Royal Society of Medicine.

The meeting opened with four papers on recent advances in the surgical treatment of mental illness originally based on the operation of prefrontal leucotomy introduced by Moniz. The developments described were designed either to avoid the uncertainties of prefrontal leucotomy as to localisation of the cut, or to obviate its undesirable side-effects, or both.

Prof. **LARRY POOL** was the first to replace the "blind" method of cutting the fibres leading from the frontal lobe to lower centres, by systematic removal of frontal areas, which he calls topectomy.[1] The disadvantage of his method is the need for careful control of the blood-supply of the removed area, which may involve larger parts than was originally intended.[2]

Dr. W. B. **SCOVILLE** tries to avoid this by his method of selective cortical under-cutting in which the areas are separated from the underlying white matter without being removed. From his description and illustrations it was obvious that the technique requires a smaller operational field than topectomy and can be performed with greater speed and with minimal damage to the adjacent tissue. His most striking finding was the lack of specificity of function of the different frontal areas he isolated. The results were similar from under-cutting the medial or orbital areas or the convexity, but were related to the quantity of tissue involved. This observation tallies with Alfred Meyer's observation that the effect of leucotomy depends on the amount of fibres cut. So far Scoville has operated on over one hundred cases and the clinical results are similar to those of the standard operation with, however, better preservation of the patient's personality.

The procedures of Pool and Scoville require a neurosurgeon and a surgical organisation that seldom exists in mental hospitals; but Prof. **WALTER FREEMAN** claimed good results in milder cases for his transorbital lobotomy. To his original technique[3] he has now added a special twist of the instrument making the operation more effective.

Freeman was the first to show that successful severing of the frontal white matter is followed by degenerations in the dorsomedial nucleus of the thalamus. This has led Prof. E. **SPIEGEL** and Dr. H. T. **WYCIS** to their operation of thalamotomy. Dr. Wycis described how, by an adaptation of the Horsley-Clarke stereotaxic technique, he and his colleagues have succeeded in producing lesions in this nucleus. With the aid of a colour film he gave an impressive demonstration of the care taken to localise the lesion effected by electrical coagulation, and to obtain a predicted result without causing any cortical damage. Dr. Wycis dealt with the technique of the operation, while Prof. Spiegel reported on the physiological and psychological results. Immediately after the operation the patient is somnolent and apathetic and suffers from memory defect. These symptoms are, however, transitory. The final effect of the operation is similar to that of prefrontal leuco there being reduction of fear, anxiety, and tension some loss of initiative. Rorschach tests carrie before and after the operation showed little c indicating that the patient's basic personalit unaffected; no change in intelligence was found. series of 59 cases there had been 2 deaths; und side-effects had been transient and included slight of one leg, and in one patient some hyperæsthesia arm, which disappeared in a few weeks. This int procedure, which has to be controlled by re X rays, promises important neurophysiological o tions, some of which were reported by the speak

From the point of view of the clinician Dr. **HOCH** pointed out that while the results of pre leucotomy had shown that no specific functio localised in the various areas of the prefrontal c there was no doubt that the operations obtain som more than non-specific brain damage. He studi effect of leucotomy in patients with non-psy personalities where the operation had been perf for the relief of persistent and intolerable pain. In gence is unaltered, but creativeness, foresight, planning ability are impaired and there is a ce apathy and lack of drive and initiative. In psyc patients the basic structure of the psychosis rem unchanged, but the patient's attitude towards symptoms has altered.

As regards the problem of what type of leucotom indicated in different clinical syndromes, little is as known. Transorbital leucotomy, since it involves least change in personality, is, according to H theoretically the operation of choice for early case schizophrenia, for affective psychoses, and for obsessi neurosis. With schizophrenia of longer standing a m extensive operation is required; and topectomy, cor under-cutting, or a standard leucotomy should carried out—the last particularly if aggression i prominent symptom.

Prof. W. **FREEMAN** felt that most leucotomies unnecessarily extensive. The extent of frontal-l isolation must be balanced against the fact that superficial a cut may be ineffective in the relief symptoms.

Dr. C. C. **BURLINGAME** described an elaborate rehab tation programme after leucotomy. As a result of operation the patient's personality becomes m malleable. Dr. Burlingame disapproves of the patie returning to the chronic psychotic ward and equally his premature discharge from hospital. Ideally, p leucotomy cases should at first be treated in a spe group because they tend to antagonise other convale patients and to interfere with their recovery. personal relations, vocational training, and proper u leisure-time deserve full attention especially in pa who have spent many years in hospital before operation.

Dr. L. **KALINOWSKY**, who first introduced the n generally applied method of electrically induced c vulsions into this country and the U.S.A., compared t procedure and insulin treatment with the operative te niques. His attitude is conservative; he prefers the l drastic treatments, resorting to neurosurgery only wh these have failed. In his experience, cases of schi phrenia with predominantly neurotic symptoms a paranoid cases of late onset which resist insulin therap respond well to leucotomy, as also do patients sufferi from involutional melancholia with bizarre soma delusions not responding to convulsant therapy. Oth indications for leucotomy—preferably by one of t modified techniques—are certain cases of affect psychoses where electrical convulsive therapy has pe sistently failed and cases of severe chronic neuroses of t obsessional type. He has found the results of leucotom in psychopathic states disappointing. In Kalinowsky view, insulin and convulsant therapies exert a dire effect on the psychosis. Patients with good prognos improve early in the course of treatment, and if recove takes place it does so with good insight; relapse however, are common. After leucotomy the type improvement is different in kind. Insight remains poo

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[1] See leading article, *Lancet*, 1949, i, 353.

[2] A paper on the subject by Professor Pool will shortly appear in these columns.—ED.L.

[3] Freeman, W. *Lancet*, 1948, ii, 371.

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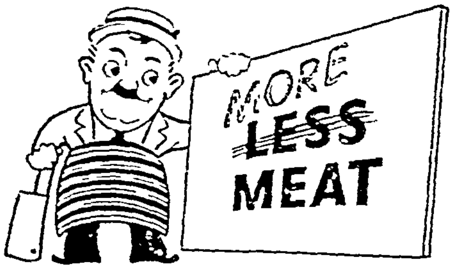

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a loop. The vectogram is the projection of the loop on to a plane. The vectogram shows by the direction of the loop the mean direction of the propagation of the cardiac impulse, and by its length the total electromotive force of the impulse from moment to moment. The cathode-ray oscillograph allows these records to be made easily. The photographic record is traced and enlarged. The authors have devised an ingenious method of making wire models of the loops in three dimensions. The whole process takes about five hours.

The first section of the book deals with the physiological bases and physical aspects of the study. In a later section the authors have calculated the standard bipolar and unipolar curves which might be derived from the vectograms and compared them with those obtained with the cardiograph. The results seem to show a satisfactory correlation. As regards the unipolar precordial leads they have compared the calculated curves obtained from a vectogram in the horizontal plane with the actual curves obtained, again with a good agreement. A number of examples of the commoner types of pathological curves are shown in another section.

Duchosal and Sulzer conclude that vectocardiography has a practical value. While it is true that there is a very wide range of abnormal loops, there is only one lead, as it were—in contrast to the considerable number now in use in ordinary cardiography. Once the principles are mastered the new method may prove to be the simpler and more inclusive. This book is not easily grasped, and the study of the subject is novel and hard. But it deserves attention, and the book should be widely read, though the mathematical part will be beyond the range of many. The illustrations and the explanations are good and clear.

Advances in Surgery

Editor: WILLIAM DE WITT ANDRAS. New York: Interscience Publishers. 1949. Pp. 554. 66*s*.

THIS first volume strikes a new note in publications for the surgeon eager to keep abreast of his subject. It is by no means a résumé of recently published papers, for it contains only seven contributions. Each of these, however, deals with a subject of great importance, bristling with unsolved problems. In every case the author is an acknowledged master in the field in which he writes. It is doubtful whether anywhere so many relevant facts about shock could be found collected together and commented upon with such judgment as in Jacob Fine's article. But almost the same praise could be given to all the contributions. Strictures of the common bile-duct, the regeneration of nerves, the problems of the immersion-foot syndrome, vessel anastomosis for portal obstruction, bone tumours, and antibiotics are all in the forefront of surgery and are all discussed in the light of new knowledge. This series may not have a wide public, but it will certainly be popular among surgeons of enterprise, imagination, and vision.

Das Hungerödem und andere alimentäre Mangelerkrankungen

Prof. HANS W. BANSI, senior physician, 1st medical department, St. George's Hospital, Hamburg. Stuttgart: Enke. 1949. Pp. 211. DM. 22.80.

ALTHOUGH a great deal of propaganda was put out to magnify its severity, the undernutrition in Germany between 1945 and 1948 was never very serious. Morals became lax but civilisation never broke down, and there was never anything comparable with the famines which decimated the concentration camps in Germany during the war.

This book is based on observations of moderate undernutrition at Hamburg, and the approach is largely clinical. Its main title, "Das Hungerödem," is misleading, for its subject is undernutrition generally, and the author devotes a good deal of space to his so-called "Mangelfettsucht" or "Paradoxe Fettsucht"—a syndrome consisting in excessive fatness in repatriated prisoners-of-war and in young women who have never left Germany. Some of the latter are described as having amenorrhœa, and the author thinks that some endocrine disturbance was responsible. The book contains some quantitative data about serum-proteins and dietary value of particular amino-acids, and of fish, and other kinds of protein in convalescence it also includes a great deal of somewhat information about essential amino-acids, carbohydrate metabolism, and so on. It is German in its approach and treatment of the matter, with neither the critical outlook nor the expected in other countries today; but it contains valuable information and there is a good index enables the reader to find this fairly easily.

The Clinical Application of Psychological Tests

Diagnostic Summaries and Case Studies. Foundation Monograph Series no. 6. ROY M.A., staff psychologist, Austen Riggs Foundation. York: International Universities Press. 1948. 30*s*.

THIS monograph—if a book weighing over 1½ rightly so described—supplements two earlier (*Diagnostic Psychological Testing*, 1945) in author collaborated with Rapaport and Gill. present work he describes the performance of in various psychiatric categories on five tests—the Wechsler-Bellevue, Rorschach, apperception, sorting and learning efficiency, modified word-association test. In a preliminary the typical abnormalities of performance are under diagnostic headings. The remaining two of the book is then given over to the actual case- Regrettably, the author has not been able to data on the abnormalities found in organic brain or mental defect; and, among the insanities, mani both catatonic and hebephrenic types of schizopl are omitted, which reduces considerably the val the summaries in differential diagnosis. The bo mainly notable for the full records of what Mr. Sch patients said ("their verbalised end-products," puts it) in the various test situations. These undoubtedly be useful to the clinical psychologi reference, and they are detailed enough for the assess for himself the interpretations which are fou on them.

How Psychiatry Helps (New York: Harper. Pp. 242. $3).—To a public that seem avid for no what psychiatrists do, this book offers restrained, acc and simple information about current practice in the U States. It is free from what Prof. Nolan Lewis, i foreword, calls "verbal champagne and nicely turned ia tional phrases." Dr. Phillip Polatin and Miss Ell Philtine have included an account of such recent, mo less experimental, procedures as topectomy and thalamot malononitrile administration, and glutamic acid; but make clear what are, in their view, the limitations of method of treatment described. Naturally they show bias, but in the main they provide an unprete jargon-free popular book on psychiatry that does not a the psychiatric reader by mis-statements or the av reader by signs of condescension and of warfare ag some named or unnamed foes.

Nutrition and Diet in Health and Disease (5th Philadelphia and London: W. B. Saunders. 1949. Pp. 45*s*.).—Prof. J. S. McLester's book needs no recomme tion to nutritionists. It is well known and valuable fo broadmindedness, its interest, and its full bibliogra As he says in his preface, another world war made us learn much about the science of nutrition. of the book has necessarily been rewritten—for exar the chapters on the feeding of infants (Philip Jeans) an nutrition in industry (Robert S. Goodhart)—and there new chapter on the feeding of surgical patients (Charle Lund). The chapter on vitamins makes no mentio Gowland Hopkins. We are apt to consider the United St the best fed country in the world, and it is therefore star to read "Evidence of need for closer attention to the ch diet is abundant." The author gives evidence of " concertingly high" incidences of nutritional deficiency anæmia from States so far apart in distance and climat Florida and Iowa. There is still much to do in educa the parents in nutrition, even in the paradise of nutriti

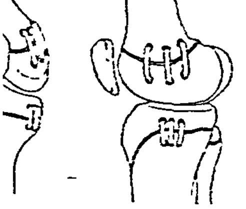
THE LANCET

ONDON: SATURDAY, SEPT. 24, 1949

Shortening Limbs

1932 there were only two surgical ways of g unequal leg length, usually the result of elitis. The longer limb could be shortened ving a segment of one of its bones, usually the ut it was always repugnant to run the risks ting on the sound side. The short limb could hened by performing an osteotomy of the d fibula or the femur, and applying traction ion was taking place. Here again there were essels and nerves from the forcible elongation, often atrophic bone did not always unite. PHEMISTER[1] introduced epiphyseodesis, in rowth at the main lower-limb epiphyses—ound the knee—was permanently stopped by destruction. This again was an operation ound long limb, and very careful calculations be made, from actuarial curves of expected to decide what was the right age for internd whether only the upper tibial and fibular s, or only the lower femoral epiphyses, or all ould be tackled to produce the desired result—legs of approximately equal length by the general cessation of growth. Moreover, if al destruction was incomplete on one side, ar deformity would result—a varus or valgus ill active side forced the plane of the knee-of true. And if the shortening turned out cessive, nothing could be done about it.

5 HAAS[2] showed experimentally and clinically gitudinal growth at an epiphysis could be cally restrained by encircling the epiphyseal h a wire loop, and that growth was resumed wire was removed or broke under the strain on it by the multiplying cells. HAAS sughat leg equalisation, or the correction of a y, might be achieved at an early age more this way than by using the complex estima- PHEMISTER'S method. Now BLOUNT and CLARKE[3] report the results of formal stapling of the epiphyses with three-sided rectangular steel staples (see figure). They find that three are necessary on each side, because one or two will be spread out or broken by the force of growth. It is important to have a radiographic check at the time of operation, for it is easy to insert one of the prongs into the knee-joint by mistake. A separate exposure of each side of the lower femoral and upper tibial epiphyses is made—four incisions in all—and the lower lateral incision is used to curette out the upper fibular epiphyseal plate. The staples are removed when the desired correction is achieved, and they have not so far been left in place for over two years. In cases of improper placement, fracture of a staple, or insufficient correction, the staples may be removed and reinserted. While the three-staple unit is in place growth at that side of the epiphysis pretty well comes to a standstill. After the staples have been removed growth is resumed, apparently at about the normal rate. Premature epiphyseal fusion does not occur if the integrity of the plate is respected at the time of operation.



es inserted into femoral and
piphyses to check growth.

What is particularly attractive about this new method is that correction of leg inequality can be tackled at once, though not usually before the eighth birthday, without waiting to see how matters develop, and it can be repeated if necessary. In addition, it provides an effective means of treating such asymmetrical deformities as fixed genu valgum or varum, and flexion or recurvatum deformity of the knee. For example, a case of knock-knee can be treated by stapling only the inner side of the lower femoral epiphysis, and in a few months correction will be complete and the staples can be removed, after which growth proceeds normally. The relative ease and simplicity of BLOUNT and CLARKE'S new procedure will certainly make it popular, and other applications to the upper limb and elsewhere are probably even now being tried by enthusiastic surgeons. Meanwhile the procedure remains experimental and staples should be inserted with care, for penetration of joints or total interruption of growth due to careless technique are hazards to be avoided.

Phemister, D. B. *J. Bone Jt Surg.* 1933, 15, 1.
Haas, S. L. *Ibid*, 1945, 27, 25.
Blount, W. P., Clarke, G. R. *Ibid*, 1949, 31, 464.

Progress with Vitamin B_{12}

THE chemical constitution of vitamin B_{12} remains unknown, but increasing supplies have allowed more information to be gathered about its action. The apparently pure crystalline form is contained in liver; and, despite the expense and wastefulness of the process, a few firms both here and in America are now able to provide small amounts from this source. The alternative source—cultures of *Streptomyces griseus*[1]—has also been developed. The activity of concentrates from these cultures has been estimated by their growth-promoting potency for *Lactobacillus lactis* Dorner; and a crystalline product prepared from these concentrates resembles that from liver and seems to have exactly the same clinical activity.[2]

There is no doubt now that vitamin B_{12} from either source will produce a typical remission in pernicious anæmia, nutritional macrocytic anæmia of the southern U.S.A., and West Indian sprue. The dose needed for a proper remission is estimated by SPIES and his colleagues[3] at 100 µg.; and JONES, DARBY,

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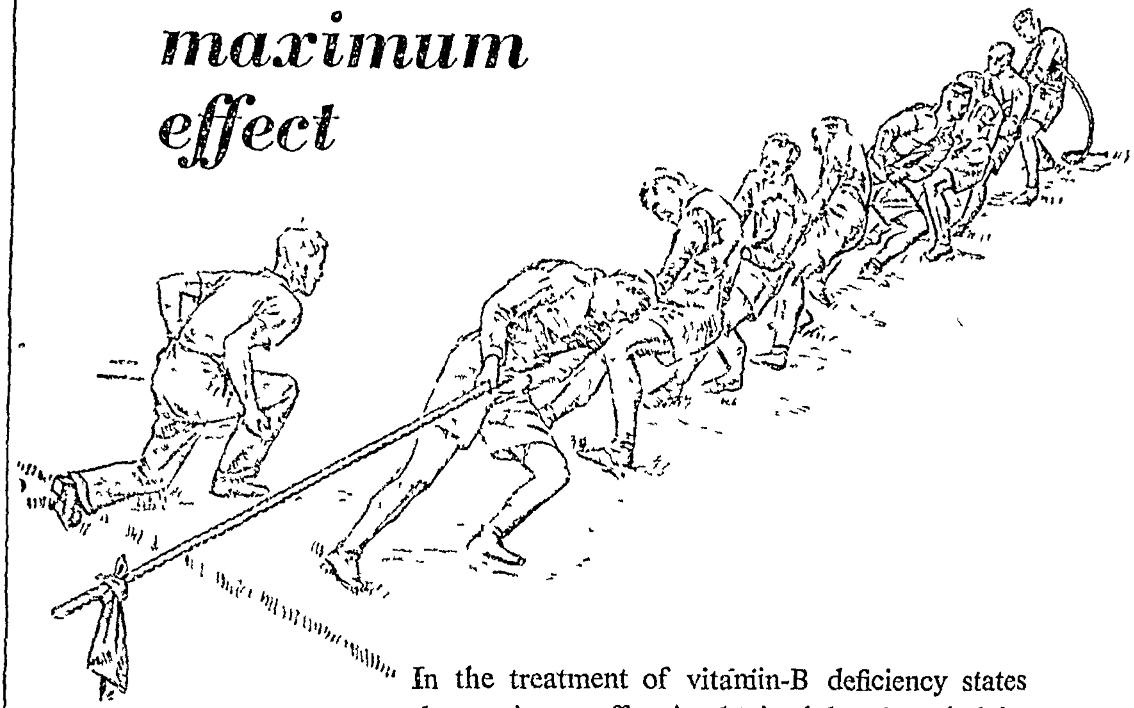
1. See leading article, *Lancet*, 1949, i, 151.
2. Erf, L. A., Wimer, W. B. *Blood*, 1949, 4, 845.
3. Spies, T. D., Suarez, R. M., Lopez, G. G., Milanes, F., Stone, R. E., Toca, R. L., Aramburu, T., Kartus, S. *J. Amer. med. Ass.* 1949, 139, 521.

Towards maximum effect



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Opinions of the N.H.S.

KING to the Physiotherapists' congress last n national schemes of medical care, Dr. J. A. ES doubted "whether any contemporary subject parable social importance has received anything e same amount of attention, has stimulated thought, or is provoking universally more stations of human emotion."[1] It being so, ld be useful both to present inquirers and to historians to have the *Practitioner's* review of tional Health Service's first year.[2] It takes m of a symposium by anonymous contributors, as being "outstanding in their own spheres," "an intimate knowledge of the working of the nd being free, "so far as possible, from preju- Actually, as was to be expected with so many , the articles are uneven, and though most are ly objective, some can hardly claim to sustain m from prejudice, be it against the Government, inst other workers in their own or in rival es of the profession. In fact so much does contributor reveal of the problems and dis- ctions of his section of the profession, and so do these troubles coincide with, or even overlap, of the group next considered, that the reader is ell aware that the first year has brought ttled pattern, and that much remains to one before the service can develop its full tial.

symposium begins with a fair review of major s, relating how the hospitals were taken over, ending their administration in large regions the regional boards, and describing the diffi- s met in the grading of medical staff and in ing establishments. It regrets that for general ice there is no sign of the promised health centres, emphasises the very real danger that the good tions of the Act will founder on the rock of e. The physician who writes next finds "no nce that the health of the nation has benefited the first year" of the service; nor does it appear he has found or sought any greater opportunities ving better service to his colleagues or his patients. d he seems more concerned with judging the nt fluctuations and future trend of private ltant practice, and with suggesting ways whereby that he thinks poorly remunerated (such as ciliary visits) can be relegated to junior col- es, and entirely unpaid ones (such as committee) to whole-time consultants. The surgeon, ly, is more forward-looking and sees in the Act amework round which, given vision on the part ccessive Ministers and an enthusiasm based on dence on the part of the surgeons themselves, a ce second to none can eventually be built." The se "successive Ministers" is worth noting, for too many commentators on the service have ght of it only as the immutable imposition of present Ministry rather than as a malleable nisation changing with the changing needs of the le and of the profession. The obstetrician, though ing with caution and objectivity, lays possibly too much stress on the difficulties arising through the present division of responsibility for maternity services between regional board, local health authority, and executive council; he probably overestimates the advantages that might come from placing the whole hospital and domiciliary service under an already harassed regional board. In the thoughtful contribution from a country practitioner it is a little disconcerting to find resistance to the general view that country cottage hospitals should in future have regular visits from consultants: "no doctor of any character will be content for the rest of his days just to dance attendance on specialists or consultants as a 'clinical assistant.'" A town practitioner brings out the need for a number of changes such as the lowering of the maximum number of patients allowed on a doctor's list, the increase of the capitation fee, and the early provision of health centres.

Two newly qualified doctors help to remind us of the different conditions under which they are entering medicine; not only is there more competition to obtain and keep their place in their teaching hospitals, but the time spent in the Services and in obtaining higher diplomas leads to a later start in independent practice. The ophthalmologist who follows succeeds at least in displaying the magnitude of the problem facing his specialty and in demonstrating how long it must be before the full and permanent ophthalmic service, based on the hospitals, can be established: until which time the supplementary ophthalmic service, with its expense and its shortcomings, must remain with us. The dentist gives an interesting factual survey of the development of the dental service, and shows all too clearly how the service to mothers and children, which was meant to have highest priority, has in fact been sacrificed to the general dental services, and how even here careful conservative work is at a discount. His conclusions are perhaps too pessimistic, but we can all agree with his dictum that it is "scientifically wrong, as well as economically unsound, to provide dentures for octogenarians while allowing the teeth of the rising generation to be neglected."

The medical administrator who writes the next article is obviously a senior officer of a regional board: he has seen much of the evolution of the hospital service, and his experience is so well described that it makes a valuable record. He appreciates the volume of work undertaken by the members of the regional boards, and says that "no praise is too high for them and for those members of the medical profession who have helped so materially and so unselfishly in the planning of the service by their work on advisory committees of all kinds." The contribution from the Ministry itself is largely a factual and historical survey, which helps to put the rest in perspective. After which comes an article, on the service in Scotland, which is in many ways the best in the series: besides commenting shrewdly upon the differing methods, customs, and statutory requirements of the two countries, it gives in small compass an excellent survey of the interdependent development of the hospital, consultant, general-practitioner, and public-health services in Scotland, with telling remarks on each.

Among the other contributions is one from an almoner pointing to the advantages the Act can offer

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ctracts from Dr. Charles's address appear on p. 571.

e National Health Service Act in Great Britain: a review f the first year's working. Supplement to September issue. 5s. to non-subscribers.

and TOTTER[4] suggest a dose of 3 µg. daily for six weeks, and then a maintenance dose of 1 µg. daily, to be given parenterally. These doses are somewhat larger than was anticipated.

Does vitamin B_{12} succeed where folic acid fails—namely, in countering the neurological complications of pernicious anæmia? The evidence is still slender. We have already referred[1] to the single case described by BERK and his associates; their patient responded rapidly, but symptoms had been present for only 11 days. HALL and CAMPBELL[5] described 6 cases; in 3 improvement was rapid, but in the other 3 it was not so noticeable. SPIES and others[6] treated a single patient with severe neurological signs; he could not walk and the plantar responses were extensor. He received 100 µg. parenterally, and after five days he could walk and the plantar responses were flexor. In a later paper SPIES and his co-workers[3] gave notes on 14 patients with pernicious anæmia and neurological complications; in 9 symptoms were severe and in 5 mild. Vitamin B_{12} given parenterally caused "dramatic" improvement within ten days. One man had a neurological relapse while being treated with folic acid. He had very stiff and weak legs and hands and severe rombergism; 125 µg. of the vitamin caused notable improvement, with the disappearance of Romberg's sign, by the tenth day. These results are certainly encouraging; and none of the curious neurological relapses associated with folic-acid treatment have so far been recorded. However, judgment is still difficult; for some patients with combined system degeneration do not recover completely even with the most thorough liver treatment, and no reported case treated with vitamin B_{12} has been observed for longer than three months.

Side by side with the clinical trials, workers have been trying to find out how vitamin B_{12} acts, and whether there is substance to the claim that this is in fact the anti-anæmic liver principle. BERK, CASTLE, and their colleagues,[7] at Boston, gave a very small dose—5 µg. daily by mouth for ten days—to patients with pernicious anæmia in relapse; there was no response. But when this dose was given together with 125–150 ml. of neutralised normal human gastric juice, there was a reticulocyte response followed by some rise in the red-cell count. These results were confirmed by HALL, MORGAN, and CAMPBELL,[8] who showed—once again—that gastric juice alone is inactive. The Boston workers found that in an untreated case of pernicious anæmia the fæces contained fairly large quantities of vitamin B_{12}; and this finding has been repeated in 4 further cases.[9] CALLENDER, MALLETT, SPRAY, and SHAW[10] found that the substance extracted from the fæces reproduced the effect of vitamin B_{12} when injected parenterally into a patient with pernicious anæmia in relapse; there was a typical reticulocyte and the megaloblastic marrow was transform normoblastic. They estimated the amount of excreted at 65 µg. per 200 g. wet weight (an a daily excretion). The American workers that the "intrinsic factor" (hæmopoietin) of juice promotes absorption of vitamin B_{12} with the food, or more likely synthesised by in the intestine. They suggest that the vit as an "extrinsic factor," and deny that the anæmic liver principle is normally formed b specific reaction between the intrinsic and factors. SPIES and his co-workers[11] have now lished that vitamin B_{12} is active orally if the large enough; in their experience 30–60 amount of the parenteral dose is needed; patient with pernicious anæmia responded 450 µg. daily for ten days. This supports the that absorption of the vitamin is defective in anæmia, since the dose required seems to be siderably in excess of the daily excretion of B_{12} untreated patient.

Of the three substances—thymine, folic acid, vitamin B_{12}—that have proved capable of megaloblastic erythropoiesis back to normo vitamin B_{12} comes closest in its activity to extracts, in both pernicious anæmia and the mental macrocytic anæmia of rats described WATSON, CAMERON, and WITTS.[12] This experime anæmia, produced by an intestinal short-circu operation, was designed in the hope that the an animals could be used for the assay of liver extr But WATSON and his colleagues, together with C LENDER,[13] find that a purified liver extract ev only an irregular hæmatological response and does prolong the animal's life, whereas folic acid prod an excellent response in both respects; the actio vitamin B_{12} resembles that of the liver extract not that of folic acid. We are still not certain vitamin B_{12} is identical with the anti-anæmic l principle, and the discovery of folic acid has wa us that there exist in nature substances that transform megaloblastic to normoblastic ery poiesis but which may play no part in the ætio of the human pernicious-anæmia syndrome. evidence suggests that in fact vitamin B_{12} is not liver principle. DEDICHEN and LALAND[14] poin out that liver extracts act on the granular white c whereas this vitamin does not. More disturbing reports that the anti-anæmic activity of a given l extract does not run parallel with its content vitamin B_{12} assayed bacteriologically.[15] If B_{12} not the natural liver principle, then explanations the ætiology of pernicious anæmia based on its p perties may well conflict with those based on properties of liver extracts. Speculation is perh premature; but already it seems that in vitamin we may have a reliable means of treating pernicious-anæmia syndrome; and its high cost m be reduced by manufacture from bacterial sour instead of from liver.

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[4] Jones, E., Darby, W. J., Totter, J. R. *Blood,* 1949, **4,** 827.

[5] Hall, B. E., Campbell, D. C. *Proc. Mayo Clin.* 1948, **23,** 591.

[6] Spies, T. D., Stone, R. E., Kartus, S., Aramburu, T. *Sth. med. J.* 1948, **41,** 1030.

[7] Berk, L., Castle, W. B., Welch, A. D., Heinle, R. W., Anker, R., Epstein, M. *New Engl. J. Med.* 1948, **239,** 911.

[8] Hall, B. E., Morgan, E. H., Campbell, D. C. *Proc. Mayo Clin.* 1949, **24,** 99.

[9] Bethell, F. H., Meyers, M. C., Neligh, R. B. *J. Lab. clin. Med.* 1948, **33,** 1477.

[10] Callender, S. T. E., Mallett, B. J., Spray, G. H., Shaw, G. E. *Lancet,* July 9, p. 57.

[11] Spies, T. D., Stone, R. E., Lopez, G. G., Milanes, F., Toca, R. Aramburu, T. *Ibid,* Sept. 10, p. 454.

[12] Watson, G. M., Cameron, D. G., Witts, L. J. *Ibid,* 1948, ii, 4 420.

[13] Cameron, D. G., Callender, S. T. E., Watson, G. M., Witts, L *Nature, Lond.* 1949, **164,** 188.

[14] Dedichen, J., Laland, P. *Lancet,* Aug. 13, p. 282.

[15] See Girdwood, R. H. *Ibid,* Aug. 20, p. 346.

high places that it will be provided. It would help ase the very difficult decisions these doctors now make if a guarantee of an annual, or at a biennial, review could be given, and given oritatively and quickly.

EATMENT OF CEREBRAL CYSTICERCOSIS

L medical diagnosis necessarily implies both site ætiology of lesion, but neurology lends itself most itly to such a division; for whereas the site can be surmised with some accuracy from clinical ngs the nature of the lesion is apt to be more elusive. sed to be so with the signs and symptoms caused rebral cysticercosis. During the last two decades, ver, knowledge of and interest in this condition, result, especially in England, of the work of Sir iam MacArthur and others in the Army Medical artment whom he inspired,[1 2] has made its clinical nosis less tentative though still often inferential. y workers consider that cerebral cysticerci while are clinically silent, unless the space occupied by large cyst or many small ones is big enough to cause ct pressure effects. When they die, the cysticerci duce toxins which cause a surrounding inflammation. n by focal or general neurological signs. It may thus omparatively late after infestation that the condition nts clinically. Even then, unless the dead cysts fy, which they may do only long after their death, r presence has to be deduced from indirect evidence. most important indirect pointer is a history of residence in an area known to be heavily infested with icerci. One of the commonest cerebral manifestations e condition is epilepsy, which may have a distinctive ency to be of focal onset but with evidence of more n one focus, perhaps representing variously situated s. Seizures of unusual pattern may thus be a nd diagnostic point. Palpable or radio-opaque les in muscles or subcutaneous tissue, eosinophilia, a positive skin reaction to test fluid may also help.

hen the diagnosis is made, is anything more than ptomatic treatment possible? The question is not ly academic, for the disease is likely to be more mon in this country owing to the large numbers of tish troops who served in the Far East. In the past, nned neurosurgical intervention has been rare, ause the removal of any large number of cysts was wed as technically difficult and often undesirable; ugh cysticerci have occasionally been discovered at ration for the relief of raised intracranial pressure or signs suggesting a localised neoplasm. Now Stepien Chorobski[3] from Warsaw review the operative atment of the condition in 94 cases—23 of their own 71 that they have gathered from the published rk. They divide these into three groups, based on intracranial changes caused. In the first group, gle or a few localised cysts produce symptoms similar those of a cerebral tumour; in the second, widespread estation leads to generalised swelling of the brain; d in the third, a strategically placed cyst or a leptoeningitic reaction to the parasites obstructs the flow cerebrospinal fluid, and internal hydrocephalus results. e division seems sound both clinically and logically; ough, as the writers admit, cases are not always clearut. In their own 23 cases, 11 presented in the first group, in the second, and 7 in the third, while in the 71 other ses the grouping was 52, 2, and 17. As might be pected, the results of operation were best in the first oup—41 cases from the two series recovered or proved, whereas only 2 cases in the second group and in the third were benefited. The operative procedures used by Stepien and Chorobski were the turning of a bone flap with removal of one or many cysts (they record up to 30 in one case), simple decompression, and in some cases of their third group the Stookey operation for the relief of internal hydrocephalus. It must be borne in mind that seizures caused by cysticercosis tend to die out spontaneously. But the findings in this informative paper suggest that the value of neurosurgery has been underestimated in the past. Correct diagnosis becomes the more important, for *treatment will be effective only in cases recognised preoperatively.* This was so in 20 of the 94 cases reviewed. In Britain, thanks to the stimulus of MacArthur, the diagnosis is probably made more often. In many cases, however, operation without precise diagnosis will be undertaken as heretofore, because the clinical picture is one of increasing intracranial pressure with or without focal signs.

Two incidental observations are worth noting. First, epileptic seizures were recorded in 32 of the 73 cases in which information about focal symptoms was available; those seeing cases over here would expect the incidence to be higher. Secondly, pronounced improvement in signs and symptoms sometimes followed the removal of what must have been a trivial proportion of the total cysts present, *suggesting that simple decompression may* have been the more important therapeutic factor.

EXPERIMENTAL TRANSMISSION OF RUBELLA

THE hazard to the fœtus of maternal rubella was first indicated, in 1942, by Gregg,[1] of Sydney; and now, from the Walter and Eliza Hall Institute, Melbourne, Anderson[2] gives a detailed account of his work on a method which may open the way to reducing or even eliminating this risk.[3]

So far there has been little experimental work on rubella, owing to its comparatively low infectivity, the absence of a specific test of susceptibility, and—until Gregg's discovery—its apparently innocuous character. In 1942, Habel[4] transmitted rubella to rhesus monkeys (*Macacca mulatta*) with blood and nasal washings administered by the nasal, subcutaneous, intraperitoneal, and intravenous routes. Fever and leucopenia commonly appeared in eight days, and the virus could then be recovered from the blood whether or not a rash was present. Membrane suspensions from inoculated eggs proved infective, but no obvious lesions were found in the chorio-allantois of the developing chick. In 1938, Hiro and Tasaka[5] had transmitted rubella to children by injecting subcutaneously the filtered throat washings from established cases: of 16 children presumed susceptible and injected in this way, 4 developed typical rubella while 2 showed the characteristic leucopenia and lymphadenopathy without rash. In these experiments the incubation period was short—seven days in 3 cases, and eight days, eleven days, and seventeen days in 1 case each. With natural transmission the average incubation period is fifteen days; and it is not clear whether these workers excluded the possibility that the child who fell ill seventeen days after planned exposure, was naturally infected from one of the successfully inoculated children.

In volunteers inoculated by the respiratory route with infective throat washings, Anderson has obtained almost 50% of "takes"; and he concludes that those who escaped must have undergone previous infection, subclinical or unrecognised, since none contracted the disease when subsequently exposed. Stored at −70°C, the virus in throat washings remained active for at least ninety days. The preparation was thawed and treated with penicillin, or diluted with saline and passed through the hospital patient but also to the way in which it can be abused:

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[1] MacArthur, W. P. *Trans. R. Soc. trop. Med. Hyg.* 1934, 27, 343.
[2] Dixon, H. B. F., Smithers, D. W. *Quart. J. Med.* 1934, 3, 603; *J. R. Army med. Cps*, 1935, 64, 227, 300, 375; *Ibid*, 65, 28, 91.
[3] Stepien, L., Chorobski, J. *Arch. Neurol. Psychiat.* 1949, 61, 499.

[1] Gregg, N. M. *Trans. ophthal. Soc. Aust.* 1941, 3, 35.
[2] Anderson, S. G. *J. Immunol.* 1949, 62, 29.
[3] See annotation, *Lancet*, 1948, ii, 936.
[4] Habel, K. *Publ. Hlth Rep., Wash.* 1942, 57, 1126.
[5] Hiro, Y., Tasaka, S. *Mschr. Kinderheilk.* 1938, 76, 328.

> "It is a great pity that the Act, with its fine basic principle that no person shall by lack of means be debarred from any necessary medical advice or appliance, which has already lifted the burden of financial anxiety and brought to many of our poorest patients comforts and amenities formerly quite beyond their reach, should be so exploited and discredited by a noisy and self-seeking minority."

She is followed by a layman who pays the tribute of a satisfied customer:

> "To sum up my impressions of a year's experience. I can see that to middle-class families, it is not just a benefit, but a necessity; the cost of living has risen so greatly since 1939 that private medical care would be another increasingly expensive burden. I have not lost sight of the fact that I have increased contributions to pay not only for myself but for my staff, and that taking these into account, I am very likely paying more per annum than the amount I *should pay for the whole family as private patients in* what could be called a 'healthy year.' But it is the freedom from worry over the larger items in the health bill, such as major operations and their attendant expenses, that makes the contribution money well spent."

So it seems that he, as an individual, thinks his money well spent and that he can afford so to spend it; but the real question remains, is the money spent by the nation on this service well spent, and can we, as a nation, afford to go on using our resources on the service at the present high and rising scale? An attempt to examine if not to answer this question is made in an article written by a member of the editorial staff of the *Economist.* This surveys first the financial estimates and shows how underestimation of the extent of the demand on the service led to gross underestimation of the likely cost of all sections of the service—except only the general-practitioner service, which, being tied to a capitation method of payment, has not shown the increased cost that would by now certainly be falling on the nation had the medical practitioners, like their dental and ophthalmic colleagues, been paid by item of service. Commenting on the global sums now being spent on these three sections of the service, the economist remarks:

> "Something has gone wrong with the priorities within the Health Service itself when it is possible to estimate the worth of the services of the general practitioner, twenty-four hours a day the whole year round, no higher than the cost of providing dental treatment and spectacles."

Even more interesting and even more worrying than the analysis of the cost of the service in money is the parallel analysis of its cost in man-power, or (worse) in woman-power. The total number of women aged between 15 and 40 in the population will, it is calculated, fall, between 1946 and 1951, by 374,000. Everything we are doing to shorten the hours of nurses, to improve the student status of junior nurses, to multiply ward orderlies, to extend the radiological, pathological, and physiotherapeutic services, to say nothing of our growing clerical and administrative demands or of our programmes for building and staffing new hospitals and health centres, draws to the health services an increasingly large share of the woman-power in this diminishing pool. The competing demands of industry, commerce, education, and the other professions may make it impossible to step up the recruitment of women to nursing, midwifery the ancillary health services without interfering where with another equally important secti national effort. It is very tempting for us who inside medicine, and understand its national i tance, to assume that whatever happens health s receive precedence over all else; but it is saluta us to ponder the economist's dictum that "a c can only have the standard of living it can pay and the standard of living includes the Na Health Service as one of its components, but onl and not one with an overriding priority."

Altogether the *Practitioner* is to be congrat on producing a readable and illuminating symp Whether it will be as well understood by lay here, or by professional readers abroad, as w hope and intention of its authors and editors is a doubtful, even though appendices supply a sur *the Act, a sample of the all-too-familiar* Minis circulars, and a chronological table or "panora of British public health. Nevertheless even the u formed reader must be impressed by the amoun preparation and planning that has already gone launching the new scheme. He may gain the im sion that the launching was a little unsteady and much remains to be done before the ship is pletely fitted out, let alone sailing on an even k but he will at least see that there is no lack of exp each well aware of the shortcomings remaining i own department, and each eagerly seeking remedy.

Annotations

REGRADING

THE reviewing committees have now reached t decisions on the appeals against former grading, an an appreciable number of cases they have found re to revise their earlier verdict. But many men women undertaking specialist tasks are still grad senior hospital medical officers. As is pointed out letter we publish this week, many of these now an unenviable decision: shall they accept the perm contract which they will shortly be offered, thou carries lower status and lower remuneration than were expecting, or shall they break the ties they formed, often over years, for themselves and families in the district of their choice, and seek in o competition a post elsewhere that would make th consultants? What they most fear is that accepta now of a post in which they are graded S.H.M.O. place them permanently in that grade.

A "general post" of such doctors, entailing the break of happily and usefully established relations betw them and their hospitals, their patients, and th colleagues in general practice cannot be for the good the service. Many of these men have been denied hig status only because they are relatively junior and claim no very long experience of specialist work. W proper opportunity and encouragement this experien can often be acquired as well in their present milieu in another. What they need, and what they lack, is firm assurance that if they do continue to serve in the present posts there will be a regular and recurre review of their grading, so that they will have a genui chance of passing into a higher grade when they ha proved themselves further. Everybody seems to agr that such a mechanism for regular regrading will essential, but nobody seems to have unequivocally sa

Special Articles

MEDICAL CARE TODAY

GRESS REPORTS FROM HOME AND ABROAD *

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two national patterns for medical care are lical, and the various problems thrown up by individual systems in operation are resolved by iods and devices which are characteristically national. larly the reactions of the community, of the medical ssion, and of the ancillary workers all bear a onal stamp. It therefore seemed to me that we it benefit from a quick look at some of the trends tendencies in France and Sweden (two countries well-established systems of social insurance); that eafter we might follow the United States in its itable movement towards the inception of some form idely extended medical care; and that finally we ht consider the significance of anything we have ned, in relation to our own now recognised and blished achievement.

France

doubt whether any international comity would be rbed, even mildly, if I were to disagree with Sterne. matter of medical care is not one that they order er in France.

rtually the entire population of France is now com- ed within the Assurance Sociale, for which contri- ons are levied at the rate of 16% on the net income, to a set maximum. Local committees, demo- ically constituted, administer the collected funds. se committees are linked regionally so that the ncial burdens may be equalised between the several stituent districts, and the whole organisation is ject to governmental control and audit. The local mittees are composed of representatives of insured ons, employers, and family associations, with two tors in an advisory capacity.

he system of Assurance Sociale embraces unemploy- nt relief, family allowances, old-age pensions, cash ments during illness and maternity, death benefits, an itemised schedule of payments for medical and tal care. This last requires mathematical skill and graphical knowledge for its elucidation: for example. fee payable for a consultation differs according to ther it is given by a general practitioner or a ialist or a member of the staff of a teaching hospital, again according to whether the patient is living in is or, shall we say, Boulogne or Marseilles. The nch regard their system, despite its large staff of ctionaries, as less bureaucratic than ours. It is cer- ly less comprehensive, for its responsibilities do not ude the administration of hospitals, or any substantial re in the field of preventive medicine. In the case hospital patients contributions are made towards the t of their maintenance and medical care but this is a ent development.

et us look at the general arrangements, from the point of the doctor and the citizen in turn.

THE DOCTOR

he French doctor conducts his practice in accordance h an official code which enjoins:

ree choice of doctor by the patient.
reedom for the practitioner to prescribe.
Direct dealing between patient and doctor in the matter of fees.
Payment direct by the patient to the doctor of the fees due.

But these principles are subject to the reservation that their observation shall not interfere with the reasonable performance and normal development of the services or the introduction of social medicine.

In actual fact the principles have been consistently recognised, though close adherence to them has probably contributed to the financial debility of the scheme.

The free choice of doctor is an idea to which the patient is even more devoted than his physician. Confidence flows from this free choice, and it is claimed that in the absence of that confidence diagnosis and the institution of treatment may become difficult and in *certain cases impossible. Furthermore, the atmosphere of confidence once established will enable the doctor to reassure his patient, to take on his shoulders the patient's own fears, and to shield him from untimely examination and useless treatment even if the patient should himself demand them.*

Freedom in prescribing also adds to the security and confidence of the patient, but here the French have been a little less metaphysical. The scheme pays 80% of the cost of ordinary drugs, but only 40% in the case of special proprietary medicaments. This latter is probably a wise provision, for the Gallic zest for therapeutic variety leads the doctor to prescribe something between 40% and 50% of his medicaments in the form of proprietary pharmaceuticals. Even with us that proportion is no more than 12–15%.

Direct contact between patient and doctor in the matter of fees was long held to be such a fundamental assumption that it was never discussed. It was felt that it gave the doctor an opportunity to be charitable to the poor, reasonable to the middle classes, and appropriately demanding on the rich—though in practice it was often found that the last were not inclined to give more than an adequate recognition for services rendered. Today direct payment of fees by patients is regarded in France as the great bulwark against the institution of a salaried service and medical officialdom. The general arrangement is that the doctor charges his patient according to the official tariff, and the patient is reimbursed 80% of his expenditure by the local fund.

The official tariffs are negotiated freely between the local funds and the doctors, and are ratified centrally. Capitation fees are anathema to the French doctor; they are regarded as introducing an element of speculation which, like payment by results, should be alien to any code of professional remuneration.

THE PATIENT

The patient has, generally speaking, a service which meets the normal needs of himself and his family. He (and they) can use the same general practitioner, to whom he will pay a fee every time he receives attention either at his own home or in the doctor's consulting-rooms—recovering 80% in due course. He can move from the general practitioner to the specialist, and see the latter in his private consulting-rooms, paying a standard fee and being reimbursed in due course. He can be pathologised, or X-rayed, or appropriately cared for by the physiotherapist. He can obtain on prescription through the pharmacist all the medicaments reasonably necessary for his treatment. His wife can be attended during confinement either by a doctor or by the midwife. Under all these circumstances the established basis of payment of 80% by the funds and 20% by the patient, unless indigent, holds good. What does he lack?

Probably the most outstanding deficiency is a well-found hospital service. French hospitals, with a few renowned exceptions, fall short of the standard which we find in this country, in Scandinavia, and in the

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xtracts from the opening lecture at the annual congress of the Chartered Society of Physiotherapy, delivered on Sept. 14. The lecture will appear in full in the November issue of *Physiotherapy*, the journal of the society, whose address is Tavistock House (North), Tavistock Square, London, W.C.1.

a fine membrane, before being sprayed into the volunteer's nostrils and oropharynx. In one experiment a laboratory worker standing at least ten feet away from this spraying operation, contracted rubella; so the minimal effective dose was probably much smaller than that actually given. In these experiments the incubation period ranged from thirteen to twenty days, and sometimes lymphadenopathy preceded the appearance of the rash by as much as six days. In general, the longer the incubation period the milder was the attack. Attempts to transmit the disease to 9 subjects who had had a natural attack 6–9 years before, failed; and it was concluded that the induced disease conferred a like immunity, which would cover the average childbearing life of modern women.

Probably, however, this method will not come into general use until the risk of inadvertently transmitting other virus diseases—notably poliomyelitis—is excluded. Meanwhile it is a relief to learn that vaccination has been exonerated from suspicion of causing harm to the growing fœtus.[6]

AURICULAR FIBRILLATION IN NORMAL HEARTS

OVER thirty years ago English workers[7] pointed out that auricular fibrillation may arise in patients whose cardiovascular system seems otherwise normal; and of 651 cases of auricular fibrillation lately studied at the Lahey Clinic by Hanson and Rutledge,[8] 30 (4·6%) were in patients with normal hearts.

Of these, 10 were established cases and 20 paroxysmal. All the established cases and more than half of the paroxysmal were in males. The age at onset varied considerably, but two-thirds of the established cases were in patients aged 30–40, whilst the paroxysmal form tended to appear a decade or so later. Three-quarters of the paroxysmal cases were associated with "a psychogenic or functional element," but in the established cases no precipitating factor was found, and indeed four-fifths of the patients in this group were unaware of the arrhythmia and had no symptoms; all had a relatively slow ventricular rate (60–90 per minute) with no appreciable pulse-deficit. Of the paroxysmal cases, the great majority experienced palpitations during an attack; and then, in nine out of ten, the ventricular rate ranged from 70 to 110 per minute.

The prognosis in such cases is excellent.[9] In this series no patient suffered any incapacity because of the arrhythmia; and in 2 cases established auricular fibrillation had been present for over 40 years when the patients were first seen. Once established, the arrhythmia tends to persist. Of the paroxysmal cases in this series, one became established spontaneously and 2 following digitalis therapy. More than a third of these patients received no treatment. Should treatment be required, quinidine is the drug of choice, although digitalis may sometimes be of value. Assessing the effect of treatment in paroxysmal auricular fibrillation is often difficult, since paroxysms tend to be irregular. As Hanson and Rutledge point out, quinidine is a potent drug which is not altogether non-toxic—a fact that should be borne in mind when considering its use in an otherwise healthy person whose only complaint is of palpitations during a paroxysm.

The ætiology of this interesting condition is obscure, though there is some evidence that it originates from a nervous reflex. Perhaps, however, Hanson and Rutledge are rather rash to say that "auricular fibrillation is a disturbance of auricular impulse formation and conduction that is *a physiologic phenomenon* and a pathogenic one." This is surely stretching the of "physiologic" too far, even for these eclectic In diagnosis the important thing is to exclude presence of *acknowledged* causes of fibrillation especially thyrotoxicosis. Most physicians will than once have seen a diagnosis of "auricular fi in a normal heart" changed ultimately to " fibrillation due to thyrotoxicosis."

TOWARDS GROUP PRACTICE

STEPS towards group practice that seem "de feasible" are outlined in a memorandum to Sc executive councils from the Department of Health, asks for the councils' comment in two months' "There are," the Department rightly says, " gradations between the fully developed health with its special building, complete staff and on the one hand and the purely individualistic handed practice on the other"; and as the large expenditure recedes into the distance it is ingly important to see what can be done with material changes. Thus "it might be possible to accommodation for the administrative headquarte a group from which the health visitors, district nu and midwives could work, which would form the ce for receiving and distributing messages, and which wo house any necessary clerical staff. . . . Even in the of any special buildings at all, arrangements made among the group of practitioners for relief d sharing of clerical assistance, and more intimate coop tion with health visitor and district nurse."

More specifically, the recommended developme include (1) extension of the mutual assistance betw practitioners to mutual relief in off-duty perio (2) arrangements among a group for the receipt telephone messages for any of their number who are n immediately available, and provision for the calling a deputising doctor in urgent cases; (3) coöperation neighbouring doctors in the employment of clerical as tance; (4) the provision of simple laboratory and oth aids to diagnosis for the benefit of a group where provision would not be possible for an individual prac tioner; (5) coöperation between a group of practitione on the one hand and district nurses and health visit on the other, by arrangement between the group and t local authority; and (6) arrangements between grou of practitioners and hospital units for consultati references, clinical discussions, and ward visits.

The memorandum, which is framed on recomme tions from the Scottish Standing Advisory Committ on General Practitioner Services, acknowledges th practitioners themselves must decide the extent to whic they adopt group practice; but it insists that son authority with local knowledge must be responsible f developing practice along these lines, and this duty, says, should rest with the executive council, workin closely with the local authority and the local medic committee. It may be doubtful how far local-authorit and general-practitioner services can be integrated i the absence of a single building from which both ca operate; but the attempt is worth making. Certainly as isolated experiments have proved, a great deal can b done to improve conditions of general practice if practi tioners will join together to do it; and we hope tha much will come of this new Scottish initiative.

THE INDEX and title-page to Vol. I, 1949, which wa completed with THE LANCET of June 25, is now in preparation. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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6. Greenberg, M., Yankauer, A. jun., Krugman, S., Osborn, J. J., Ward, R. S., Dancis, J. *Pediatrics*, 1949, 3, 456.
7. Mackenzie, J. *Heart*, 1911, 2, 273. Gossage, A. M., Hicks, J. A. B. *Quart. J. Med.* 1913, 6, 435.
8. Hanson, H. H., Rutledge, D. I. *New Engl. J. Med.* 1949, 240, 947.
9. Cooke, W. T., White, P. D. *Brit. Heart J.* 1942, 4, 153.

h stem from the historic Poor Law Act of Elizabeth eby the truly indigent is provided with the necessities ie, and is cared for in illness and infirmity. But arrangements have, as they had with us until our m of social insurance and the National Health ice Act abolished them, a taint or savour which es unpalatable the service they provide.

art from this public assistance and the organised ic-health service, medical care in the U.S.A. is a ter of free enterprise. The general practitioner and specialist collect what the traffic will bear. The ntary and private hospitals must pay their way. In old days the contribution of the charitable no doubt t some distance towards defraying the annual costs he hospitals; but more and more during the present tury they have only found it possible to make ends t by selling bed-space and nursing service at their e. Patients pay the hospital for their accommoda- and maintenance, and make a bargain with their nding physician or surgeon or obstetricians for his ticular form of care. They are also liable in the jority of cases for meeting the fees of pathologists radiologists.

A brief glance at some of these hospital costs will help to comprehend the whole position. The American spital Association has recently published a comparison the average patient-day costs of 14 American hospitals 1888, and of the same hospitals sixty years later. king the average of the whole 14 hospitals, the daily intenance rate in 1888 was \$1.39; last year it was 4.61, a tenfold increase. Translating that latter figure \$14.61—at \$4 to the pound sterling we reach rate of £3 13*s.* per diem, or £25 10*s.* weekly. ese are actual hospital costs and do not necessarily present the rates charged to the patients because most spitals have some additional source of income: but rates charged do not usually fall much short of 10*s.* per day in a ward or £3 10*s.* in a two-bedded om. Add to this medical charges, the cost of con- alescence, the interruption, perhaps, of wage-earning nd one realises how—except for the indigent—serious ness in the United States is both a family and a nancial calamity.

VOLUNTARY INSURANCE

With a view to mitigating these economic pains, there as developed throughout the Union a system of volun- ary insurance against the cost of hospital maintenance hich is called the Blue Cross. There are a large number f such schemes, and they are only loosely linked together. n addition Blue Shield schemes provide insurance gainst the cost of medical care while in hospital, and a mall number of these will also pay the general practitioner's bill. The Blue Cross and the Blue Shield organisations are local non-profit-making bodies, composed of representatives of the hospitals, the medical profession, and the public. In addition, policies of a similar kind can be obtained from an increasing number of insurance companies. Furthermore, one of the recent movements in trade-union policy has been to accept the provision of medical care in lieu of an actual addition to wages. These facts are some measure of the desire to meet the need, and though the figures have not the validity of census data, it is probable that out of a population of 140 million, 40 million are covered for hospitalisation, 20 million are covered for their medical care while in hospital, and 4 million have some form of contractual arrangement with their general practitioner.

ACTS AND BILLS

The government has already taken one substantial step. In 1946 it passed the Hospital Construction Act, under which it is prepared to pay one-third of the cost of all approved hospital construction. These proposals, concentrated in the first instance on the provision of hospitals of 50 beds or less, have already gone a long way to rectify the deficiencies of the rural areas. But the deficiencies are not limited to the small hospitals. In all nearly a million new hospital beds are needed—one-quarter of them for the chronic sick, who, as with us here, have long been standing at the end of the hospital queue. There are deficiencies in professional personnel of all kinds, and of equipment also, though in the United States equipment shortages have a habit of being rectified almost over night.

The Federal Security Administrator, Mr. Oscar Ewing, addressed his famous "Ten Years' Programme for the Betterment of the Nation's Health" to President Truman exactly a year ago. It excited an amount of opposition and criticism, infinitely greater than anything we have experienced in this country. It caused the American Medical Association to enlist the services of two of the most energetic publicists in the country, so that the community should not be unaware of the evils of so-called socialised medicine. The association's policy is that a wide extension of the existing voluntary insurance schemes—the Blue Cross and Blue Shield already mentioned—will do all that is necessary.

Mr. Truman has countered by introducing a Bill for Universal Insurance, based on contributions by the individual wage-earner and salary-earner, his employer, and the State. The insurance would cover over-all medical care of the individual insured person and his immediate family. To begin with, self-employed persons and certain other comparable categories would be excluded; but at least 85 million of the population at least would benefit and the dollar barrier between doctor and patient would disappear. The Bill also provides for subsidies to the medical and nursing schools so that the future shall have its army of professional workers.

There we must leave the United States in the knowledge that nothing ever remains stationary on that great sub-continent.

The N.H.S.

Our own National Health Service has proved to be popular beyond all expectations. 95% of the population have chosen their general practitioners; the indexes of the executive councils include names from every class of society; 95% of the doctors, 90% of the dentists, and practically 100% of the chemists are in the scheme. Every day half-a-million prescriptions are dispensed; 5 million pairs of spectacles have already been provided; 8 million persons have presented themselves for dental treatment. These are most outstanding figures, but in every field the citizen is able to find what he needs for his own medical care or for that of the children, and the charges are no longer referred to him personally.

The over-all cost of the service is estimated in this financial year to amount to £228 million net for the population of England and Wales, which is roughly 2*s.* 1*d.* a week per head. There are those who cavil at this amount. It may be that within this enormous scheme there is the possibility of saving here and there—you yourselves will probably know how efficiency might be maintained in your departments at less cost—but one must see this expenditure against the background of the £300 million which is lost to industrial production each year by illness, before one challenges the need to spend it.

We, together with New Zealand, have established a complete and integrated health service for the whole of our population. Its inauguration has been a stupendous task, but the benefits which the service can bring if we use it wisely and intelligently are great also. Adequate medical care has never been a cheap commodity, and all these other nations, who will tend inevitably to move in the same direction as ourselves, will learn that too. But proper medical care can produce good health, which, like wisdom, is beyond price.

United States. To quote from a native source: "the French hospital still displays the mark of its foundation which made of it more of a refuge than a place of treatment for the indigent, pilgrims, tramps, the lame and the old. It is an establishment for lodging and not for medical care." One fact makes that obvious. If we analyse the daily cost of maintaining a patient in a typical general hospital in this country, we shall find that the amount chargeable to medical investigation and treatment, as distinct from nursing, is equivalent to about 20% of the total cost: in France it never exceeds 5%. The over-all standard of French nursing is at a level which we would hesitate to regard as adequate. Until comparatively recently it was customary for the patient to give gratuities to the nursing staff.

There are various directions in which the French system of medical care is still striving after improvement and amplification. One cannot avoid the conclusion that the completion of that task will add materially to the already mounting cost of social insurance.

Sweden

In Sweden the basis of medical care is twofold. There is organised sickness insurance within a circumscribed field, and a magnificent hospital system, maintained by local and central taxation, which is available to everyone.

As has happened elsewhere, the sickness insurance which commenced as a mutual and voluntary association of workmen or of individuals living in the same locality will become in 1950 a compulsory system covering the whole population. The new service will be an extension of what is in existence now, and the insurance societies will continue to be managers of their funds under government supervision, receiving about half their premium income from the national exchequer. The remaining half will be composed of the family subscriptions paid by insured persons at the low rate of 32*s.* per annum. These funds will cover the cost of sickness payments, of medical benefits, and of maternity subsidies. To help *towards the cost of invalidity and old-age pensions* a further annual levy of approximately £7 a year per family will be made.

Under medical benefit a general practitioner, freely chosen, is provided, and such medicaments (except a limited range of expensive drugs) as are required for treatment. The patient pays the doctor, and recovers two-thirds of this expenditure from the sickness fund.

During recent years the Swedish local authorities, the cities, and the counties have built up one of the finest hospital services in the world. (Mental hospitals, generally speaking, are the concern of the State.) A daily token charge is made for each patient to cover the cost of his food; but even this is remitted for the indigent. The rest is free—specialist care, pathological and radiological investigation, nursing, physiotherapy. Every class of the community uses the municipal hospital, for in the modern hospitals there is a large range of single and two-bedded wards; and though it is possible, as with us, to be treated as a private patient, the inducements to do so are small, and empty beds in the paying section are far from uncommon. Next year even the token payments will disappear, and the hospital service in Sweden will be completely comparable with our own. *This decision to free the hospitals* has been reached despite the fact that hospital costs in 1948 were approximately three times what they were in 1938, and that the weekly cost of maintenance in the average general hospital is of the order of £12, of which roughly 60% represents salaries and wages.

PERSONNEL

What then is Sweden's great problem? It is dearth of personnel in every field—doctors, nurses, and ancillaries.

There are slightly more than 4000 doctors to serve a population of 7 million—a doctor-patient ratio of 1 to 1750 compared with 1 to 1400 in France and 1 to in this country. Medical fees are not high, salaries paid to whole-time staff are moderate standards; but on an average doctors are well up top 5% of the income groups. Their scarcity increased their power as a pressure group and it be a mistake to assume that they have looked future without apprehension or that they have adopted such measures of immediate self-pr seemed expedient. But there are many medical and nurses and others in Sweden who take the themselves only after the claims of public service been satisfied. In the northern counties there are no more than 3 doctors to 10,000 of the populati their territory covers many hundreds of square *Under these circumstances, the individual doctor* be an Admirable Crichton. He is medical officer of general practitioner, specialist, and often and justice of the peace all combined. His salary part guaranteed by the State, and the fees he ch private patients are regulated by agreement. It need to maintain a proper standard of medical these remote parts, and the almost insatiable of the hospital service for more and more medical —physicians, pathologists, specialist surgeons, of the newer techniques of neurosurgery and t surgery, in whose growth Sweden has played a siderable part—which constitute the real crisis in medical affairs. With enlarged medical services demands not only for more doctors but also for physiotherapists, laboratory technicians, and every of medical auxilliary.

The Royal Medical Board of Sweden has that if it is to provide a service of the comprehe *which modern standards of medical care* envisage, will be necessary during the next twelve years to the number of practising doctors from 4200—the total—to 7200, an increase of 70%. The rate at whi the profession is growing now would add no more th 500 during the same period.

Sweden, with her eyes open, and fully aware of t economic burdens which a coördinated and comp hensive health service can place upon a community, nevertheless persuaded that the cost is worth while.

The United States

We have already mentioned two countries expenditure on their health services will inevitably increased if the objectives they have in view are to reached. France will not be able to modernise hospital service without great capital outlay, and complementary increase in maintenance charges. Swede will find that the establishment of additional medica schools, and the fitting out of new teaching hospitals an expensive business. And beyond all that there wil be the ultimate cost of providing for large additions not only to the strength of the medical profession, but to the other ancillary professions also.

The cost of medical care has special relevance in the United States of America. Ten years ago the American Medical Association carried out an inquiry which showed that an annual family income of £750 was not sufficient to bear the cost of a serious or chronic illness. The American Hospital Association, cognisant of the vast increase in hospital costs which has occurred, has attempted for many years to bring the individual citizen and his family within insurance schemes which will at any rate cover the maintenance charges in hospital. The man in the street is aware that unless he makes provision by way of insurance—and at rates which though actuarily fair are nevertheless heavy—he must face the possibility of some catastrophic disaster to his financial stability if major illness besets himself or his family. In every State of the Union there are of course arrangements

In England Now

Running Commentary by Peripatetic Correspondents

s a wet morning the Holiday Camp on the windy ks like an outsize fun-fair before the fun has started. scarlet-coated cheerleaders dart about, busy with arations; the giant clowns in the centre smile down dly on bedraggled campers drifting into chemist, monger, gift-shop, and stationer (the fish and chip is not yet open), or disappearing into "Rhenish" cellars, "Old-Vienna" cafes, and neon-lit snack-bars re, right up till lunch, weak tea and coffee and too large colourful cakes are served on pink plastic to patient ers. The solemn lad at the next table with his ed member's badge wastes no time on thirds and s himself to three vast cream puffs.

en the unquiet fun will be taking its allotted course g while the eye is allowed no rest. Someone has heard t bright colours make for cheerfulness; all the hues he rainbow pursue the campers mercilessly. The ters have splashed buckets of red, green, pink, blue, d yellow on walls, beams, chairs, tables, and counters never-ending contrast. Multi-coloured lights and tering tinfoil borders gleam along the ceilings. Nothing hat it seems: artificial flowers bloom in unlikely ces, bricks are painted on papier mâché; imitation f vistas of Montmartre, mountain scenery, striped ings, and false panelling disguise the concrete walls. t at the end of a summer's fun the disguise is beginning wear thin here and there, the turf has faded, the paint cked. Fun-fairs don't grow old gracefully.

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The physician-superintendent tells me that I'm to stop nagging about my contract and my back pay. "You know you'll get both sooner or later, so why worry?" he says. But now I have worked out the situation in business men's terms I worry even more. I am a partner in a business and part of the capital is in the form of a loan from the Westminster Bank. The hospital has its own money in the same bank. I pay the bank interest on my loan and the bank pays the hospital interest on the money in its deposit account. So I seem to be lending my salary to the hospital and paying interest on it. The actual cash I have lost already is between five and six pounds. Perhaps not much to the N.H.S. but quite a bit to me.

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* * *

"Daddy, you're so clever you ought to be a workman, not just a doctor."

THE DENTIST'S DAY

WORKING PARTY'S REPORT

THE Working Party set up under the chairmanship of Mr. W. Penman, to investigate chairside times taken by dentists in carrying out treatment, has now reported.[1] The report suggests that the following picture of the dental profession in Great Britain should be borne in mind:

> "Most dentists are working longer hours than is comfortable, or than would be good for them if continued for too long a period, and many of them are working more quickly than they would normally. These conditions have been forced upon them by the influx of work which has resulted from the expanded health service. As a body, they have been trying to cope with the difficult problem of keeping pace with demand without loss of efficiency and, as a body, the working party thinks they should have received more gratitude and less adverse criticism than has actually been the case.
>
> "Moreover, there is little hope of an early improvement, even if demand should lessen in certain directions. It cannot be doubted that the present volume of work is held down by the inability of the dentists to do any more, and, as was indicated in the Teviot interim report, it will probably be many years before there is any appreciable increase in the number of dentists."

"Human beings," adds the report, "are rarely actuated by a single motive." Some dentists are admittedly working too long, too quickly, and with an eye fixed too closely on the monetary reward—even to the point where their efficiency may be questioned. Up to this point neither the State nor the patient suffers, and the comparatively few cases of very long hours, very rapid work, and very high earnings, though they should be investigated to expose inefficiency or establish efficiency, are not to be regarded as a major factor in considering terms of service.

HOURS AND EARNINGS

The Spens Committee recommended that chairside hours each week should not exceed 33, and the committee estimated that this number of hours at the chairside would involve altogether some 42 working hours. The Working Party's report shows that last April, of 261 dentists in a random sample, 70 were working shorter hours than this standard, 25 were working to about the standard, and 166 (64%) were working longer hours than the standard. This 64% (who are doing 73% of all the work) are working on average rather more than nine hours a day for a $5^1/_2$ day week, and their chairside hours are some 25% in excess of the Spens standard.

As to earnings, the committee finds that on average, before the introduction of the "ceiling" of £400 a month (which has since been abandoned in favour of a reduced scale of fees), dentists engaged in the National Health Service were earning about 19% in excess of the Spens standard. Of this 19%, about 11% is covered by hours in excess of the Spens standard and about 8% by speed of work in excess of that assumed in 1948.

The Working Party is satisfied that the private work done by National Health Service dentists represents only about $4^1/_2$% of their total operations; and it

> "regards that figure as disposing of the suggestion, which has sometimes been made, that any considerable section of the dental profession is using the National Health Service on a substantial scale as a cloak under which to obtain comparatively high private fees, as the price of giving priority of treatment. It is felt that a dentist who was in practice before July, 1948, may very well have a small proportion, such as 4 per cent., of his old clients who prefer, for the present even if not permanently, to retain their old relationship as private patients."

Surprisingly perhaps, an average of $3^3/_4$ taken up in parting with one patient and installin next; and this figure is about the same in private pr as in the service. This time "could not be appr reduced without such a degree of haste as might in discourtesy." On the other hand, the Working P expresses the view that there could be some econ chairside time by such measures as employing a h trained chairside assistant, setting up a second and following a systematic routine.

As the following figures indicate, dentists in priv practice undertake relatively more fillings than th the service:

	Completed operation		
	Fillings	Extractions	Dent
	%	%	%
Dentists outside N.H.S.	38·1	9·3	5
Dentists in N.H.S.:			
Private patients	13·9	42·3	87
N.H.S. patients	30·7	23·3	1

The discrepancy in respect of private patients tre by dentists outside and within the service is attrib "with some diffidence" to private work done by den in the service for people who are in a hurry.

MEDICAL DEFENCE UNION

AT the Medical Defence Union's annual meeting London last Tuesday, members agreed that the su scription be increased to £2. In his presidential addr Mr. St. J. D. Buxton explained that during the l year the membership had reached 33,200—an incre of 1100—and the subscription income was over £30,0 But law expenses and indemnity claims alone cost ov £35,000, and during the last two years the total exp diture had exceeded the income from all sources £20,000. It appeared to the council improvident continue to deplete the Union's invested funds.

> "These figures indicate two things: firstly, that t Union does not hesitate to protect its members, whatev the cost may be, and secondly that to do this a larg income is required. It is known that many memb realise that the subscription rate has remained unchang for many years and are surprised that it has not bee raised. All know that the cost of everything, from da bread to legal damages, has risen. Hence the recomme dation before you is to raise the subscription rate to with modifications in rates of life membership, &c., on approved scale. This policy has not arisen from the expe of one or two cases, but because of the upgrade of costs."

The annual report for 1948, which was presented the meeting, shows that no fewer than 1959 membe sought the Union's assistance, 69 having been accuse of professional negligence. At the meeting Mr. Buxto gave a particular warning about ancillary examinations

> "The patient," he said, "knows little or nothing abou the work of specialists who conduct X-ray, pathological or other examinations. If a member acts on one of thes which happens to be an erroneous report, given in good faith, he may fail in his duty and be charged with negligence with the other doctor as a co-defendant. Hence it is o the utmost importance that consultation with thos carrying out ancillary examinations should be made, at least whenever there is doubt, both for the sake of th patient and the doctor."

Assistance to a member will be given most easily, he added, if he will consult the secretary as soon as he finds himself in a medicolegal difficulty.

Mr. Buxton paid warm tributes to the officers and staff of the society, and also to Mr. Ivor Back and Dr. Henry Robinson, chairmen of committees. Having several times been re-elected president by the elected members of council, he had now, he said, informed them that he wished to end his term of office. He is to be succeeded in the presidency by Mr. Ivor Back.

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[1] Ministry of Health and Department of Health for Scotland: Report of the Working Party on the chairside times taken in carrying out treatment by general dental practitioners in England, Wales, and Scotland. H.M. Stationery Office. Pp. 77. 1s. 6d.

In England Now

Running Commentary by Peripatetic Correspondents

s a wet morning the Holiday Camp on the windy s is like an outsize fun-fair before the fun has started. scarlet-coated cheerleaders dart about, busy with arations; the giant clowns in the centre smile down ally on bedraggled campers drifting into chemist, monger, gift-shop, and stationer (the fish-and-chip is not yet open), or disappearing into "Rhenish" -cellars, "Old-Vienna" cafés, and neon-lit snackbars re, right up till lunch, weak tea and coffee and too-large colourful cakes are served on pink plastic to patient ners. The solemn lad at the next table with his ured member's badge wastes no time on fluids and lies himself to three vast cream puffs.

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"Daddy, you're so clever you ought to be a workman, not just a doctor."

Letters to the Editor

SEEING THE PATIENT THROUGH

SIR,—Dr. Lipscomb's article last week must have set thinking all those in daily contact with hospitals.

As a general practitioner I am responsible for sending many patients into "hospitaland" and find them often returning confused and crestfallen. They are confused by the number of doctors whose hands they have to pass through, and crestfallen after the long waits and ignorance of the findings at the end of it all. "I will write to your doctor" may give them one comfortable night's rest, but when the doctor has not heard after a week or more, even though he has tried to stimulate the registrars' room, the patient and his doctor begin to ask "Who sees us through from here?"

We send cases to hospital:

(*a*) Because, though we know the diagnosis, treatment can only be adequately carried out in hospital. This class includes most emergencies and usually the patient is "seen through" very creditably.

(*b*) Because we are uncertain of the diagnosis or treatment and require another opinion so that we can coöperate more confidently with the patient in the treatment of his condition.

It is here that any lack of coördination in the "medical world" will be to the detriment of the patient, by tending to arouse uncertainty in his mind and make him lose confidence in those trying to treat him.

Wealdstone, Harrow. L. P. DAVIES.

SIR,—It seems to me that you were too mealy mouthed in last week's leading article. The first assistant "CAN make it his duty . . ." "CAN see to it . . ." "CAN help to achieve. . . ." The chief "CAN" do three things to help the patient's progress to health. "Many of these alterations may be impracticable in an established system." I suggest that MUST be substituted for your CAN; and if the established system makes that impracticable then "Sae much the waur for the coo."

The essential thing is that the man who takes charge of the patient in the outpatient department must remain in charge of him in the wards till his discharge. That of course entails the subdivision of the ward beds so that each outpatient chief has his share, and that there shall be as many outpatient chiefs as may be necessary for the efficient running of the departments, whether medical, ophthalmic, or other. And further no-one shall have beds who does not feed them from his own outpatient list. In addition, all outpatients shall be seen by appointment only, and the chiefs of the clinics must attend punctually and supervise and be responsible for the disposal of all patients of the clinic. These same chiefs should dictate the letters to the patients' doctors whether after outpatient investigation only or after discharge from the wards.

All this may need a revolution in a London teaching hospital, but I contend that if required it would be a beneficial one and it is not impracticable since it works well in a certain large provincial hospital.

Coventry. W. FRASER ANNAND.

SIR,—What a sad story Dr. Lipscomb tells, and how unnecessary it would be if "outpatients" were abolished; if every ambulant patient were brought into the consultation section of the unit; met at first arrival by the team-sister, nurse, house-surgeon, registrar, and consultant; and kept as one of their "children" until he could be finally returned to his own doctor, fit to resume his occupation, sound in mind and body; and how much better still if one of the general practitioners were, in turn, a member of the team.

That was the idea behind the design of the new Westminster Hospital. Whether the ideal is reached maintained is neither here nor there.

London, W.1. E. ROCK C

SIR,—It is remarkable that Dr. Lipscomb should written an article, and you an editorial, on seeing patient through, without mentioning the place of almoner in the scheme of things.

The relationship between the patient and the teaching hospital, with its persistent shortage of its large outpatient consultation departments, and responsibility for the education of students, and nurses, is complex and must be recognised as To be satisfactory it needs not only good intentions also good organisation. In my own unit the now interviews all outpatients whose names are the admission list, to see that they have no unask unanswered questions; she discusses all inpatients the doctor in charge of the ward to ensure that the is true before discharge, and takes part in the follow-up inquiry which is made on all patients months after discharge. The aim of the follo inquiry is to make sure that diagnosis, treatment, aftercare have been fully effective, and, like a sluice a river, it seems to raise the level of social care through the whole preceding period.[1]

The success of the scheme depends on the almo being an integral and permanent member of the not just another service laid on by the hospital. I my impression that it solves most of the difficul mentioned as occurring between the hospital and patient. I claim little personal credit for it. It inspired by an economist who carried out a survey of local hospitals in 1938 and told me bluntly that business would survive for a year if it knew so li about the satisfaction of its customers as we did, and has been devised by the able almoners who have wor with me since. The difficulties between the hospital the general practitioner can similarly be smoothed by good organisation and a medical staff of whom some least have had experience of private or general practic

Radcliffe Infirmary, Oxford. L. J. WITTS

SIR,—Dr. Lipscomb, writing tellingly last week of numerous small breakdowns in our hospitals, states clearly the case for the medical records officer.

The medical records officer is trained to smooth first line of approach of the patient to the hospital. acquaints the general practitioner with outpatient tim and commonly he supplies a convenient form of let on which application for appointment may be made.

He is responsible for the work of the appointme clerks, seeing that they deal sympathetically and inte gently with inquiries; and he makes sure that appoi ments are timed to the needs of the patient and clinician. A trained appointments clerk will tell patient how to get to the hospital, for what to be p pared, and how long to expect to stay. These lit courtesies, which make all the difference, are b carried out by one whose duty it is not to forget them.

With a good appointments system, all medical recor and reports concerning a patient may be assembled w before the clinic starts, so that there is no delay whi clerks search for missing information. Case-notes a of great value not only for the rich store of informatio they contain, but also as the hospital record of th identity of the patient who looks to it for advice. Th are not so much paper to be thrust into the pocket of a absent-minded leave-taking houseman, to be remove to a remote department unrecorded, to be left stack in an untidy filing department, to be pushed aside an then sought frantically while the clinic is in progres r should a patient seeking reassurance and advice his faith shattered by the hospital's incapacity to lace his case-paper.

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[1] Bock, I. F., Gardner, F. V., Witts, L. J. *Brit. J. soc. Med.* 19 1, 197.

n appointments system will provide a clinician with ear picture of the day's work. A short conference allocation of cases, a glance at case-notes and nts, and a recapitulation afterwards of the cases h have been seen, will ensure continuity and coordition. Forewarned by the appointments system, the oner and members of other auxiliary departments cooperate over their cases with the medical staff. special clinics for teaching cases, the clinician s that in teaching he is not dislocating a carefully nged time-table, storing up patients to be rushed ugh at the end of the session or to be pushed on to er men. Student firms have a programme for the t and need not wait at unproductive clinics: and r a few words of explanation the patient may reciate the teaching importance of his case and kely secure the time for a second appointment for hing purposes.

he next step made easy by the medical records officer ception and registration. The medical records officer l consider in detail the approach of a patient to the pital. He will see that adequate directions are lable at all entrances, and that the patient quickly s his way to the registration desk, has a few words welcome and reassurance, and is comfortably seated. first registration the clerk will record the general ntity data required by every hospital department; d he will pass these on, thus saving endless repetition the patient. Often a receptionist escorts the patient the clinic, telling him whom he may expect to see.

After the clinic, the patient may need to have X-ray, hological, and follow-up appointments, which can be nged by direct inter-hospital communication at the patient appointment desk.

A reply may be made to the patient's doctor. The cords officer can either organise a pool of secretaries set up a team consisting of appointment and registran clerk, clinic receptionist, and medical secretary, to llow through the outpatient and inpatient work of ch firm.

The medical records officer will probably place the rdination of arrangements for admission and discharge the hands of an admission secretary, who will secure information required for an intelligent record on the aiting-list, tell the patient what he should do before mission, and acquaint him with the contents of the struction booklet which she will send to him before dmission. The admission secretary receives the bedtates each morning, and prepares the central record of noccupied beds. Under the direction of the firms who hold the medical responsibility for admission, she calls he patients who are to be admitted; she may inform heir doctors and will certainly send to each patient a etter accompanied by an informative booklet. She will arrange for an ambulance, inform the wards, the almoner, the chaplain, the caterer, and other departments, and have all records assembled before the patient's arrival.

The patient whose admission has been arranged will lready know the admission secretary's office, and will be expected. A time will have been arranged to receive him, to obtain any necessary legal consents, and receipts for valuables deposited, and conduct him to the ward with his case-papers assembled ready.

When a patient is to be discharged, the admission secretary will be forewarned. She will make sure that the arrangements for his return home or to convalescence are well made, arrange his follow-up appointment, explain instructions for his future welfare, have ready his ration book and valuables, and bid him farewell on behalf of the hospital, attending to his requests, complaints, or difficulties.

It is a pleasant and convenient arrangement for inquiries and calls from relatives and general practitioners to be dealt with by appointment by members of the hospital medical staff in a small room adjacent to the admission secretary's office where any patient may converse with his hospital doctor before discharge, and for calls of lesser importance regarding a patient's health to be dealt with by the admission secretary.

With sufficient secretarial help it should not be so difficult for the medical staff to find time to dictate concise medical summaries and letters to general practitioners, preceded by short notes on discharge.

In one conclusion I disagree with Dr. Lipscomb. In the absence of a medical records officer, no doubt an increase in registrars might ease the position; but what a waste of medical training! How would one ensure that these extra registrars had in their mind's eye the remedies Dr. Lipscomb envisages, and in their hearts the intention to see them through? Is it not better to appoint a specialist in coordination, properly trained, whose work is not simply a sideline born of sympathy? I am quite certain that a good medical records officer, having the goodwill of the medical staff and a well-ordered department, does successfully achieve the personal touch.

G. L. JOHN

St. Olave's Hospital,
London, S.E.16.

Medical Records Officer,
Bermondsey and Southwark Group
Hospital Management Committee.

SIR,—The article by Dr. Lipscomb and your leading article last week draw timely attention to a state of affairs of which all are conscious, which many attempt to improve, but which still makes for an unsatisfactory relationship between patient and hospital.

May I be allowed to point out, though, that so far as the teaching centres are concerned, one party appears to have been omitted from consideration—namely, the student. Despite the very junior position he occupies in the hospital hierarchy, the student is always impressed with the fact that he is a most important member of the team in getting to know the patient and giving reassurance from time to time.

Yet what does he find? He is well able to get acquainted with the patient on admission and conduct a most thorough examination. The registrar then teaches on the case as illustrative of a certain disorder. The chief later discourses upon it, uttering diagnostic wisdom and suggesting further tests and treatment. Thereafter the enthusiasm tends to wane. The houseman is largely responsible for further progress. Meanwhile the student, conscientious as he may be, finds it difficult to keep au fait with all that is happening. He observes from the bed-letter what treatment is being prescribed and deduces from the various reports a little further information about the pathology. The response to treatment he must judge for himself: and what bearing this will have on the outcome of the case and its final disposal he must surmise. Consequently when the patient inquires, as he soon does, what is going to happen next and when the stay in hospital will be terminated, the student, upon whom so much is said to depend, has perforce to give an evasive answer.

This difficulty can be solved, and in fact is overcome, particularly on certain firms. A weekly round of all patients can be conducted to discuss the present position and eventual result. Probably the best person to arrange this would be the houseman, but he is often recently qualified, and in any event is extremely busy. Once again the clinical assistant or registrar must shoulder this further burden, despite his present heavy load. There is no suggestion of aiding the lazy student, but he who would discuss with the patient must be able to speak with the authoritative voice of his chief.

London, W.2. ROY GOULDING.

CONCENTRATION OF DIPHTHERIA ANTITOXIN IN CORD BLOOD

SIR,—It seems that Dr. Wiener, who wrote last week, is not familiar with diphtheria-antitoxin titrations. May I suggest that he reads an article by Glenny and Llewellyn-Jones [1] which describes the methods used at the laboratories where the cord-blood samples were tested? Very few tests are necessary to obtain an accuracy of 10%. The final tests on these blood samples were made at 10% differences (as was made clear in our paper) and not 100% differences as Dr. Wiener evidently thinks.

All measurements of toxin and antitoxin in the titrations were made by a group of technicians with no knowledge of the nature of the samples they were handling. The readings of the reactions in the test animals were made by one of us who has had 20 years' experience of such work, and these reactions were a very small proportion of a daily average of about 500 read at a single sitting, without any reference either to former or to possibly expected results.

Final results were collected by a third person who applied a rigid formula to calculate the value of each sample. Thus a sample for which a test mixture at 10 units gave no reaction on each occasion, and a test mixture at 11 units always gave a reaction, was allotted a value of 10·5 units. If on one occasion the test for 11 units was recorded as a reduced reaction, or a very slight reaction was produced in a test for 10 units, the calculated value would be slightly different, but still between 10 and 11 units.

I have given an example of the simple procedure that we adopt in the interpretation of values, because some of your readers who do not know the extreme accuracy with which diphtheria antitoxin can be titrated might think that Dr. Wiener was writing with authority when he refers to a minimum error of 100%.

Wellcome Research Laboratories,
Beckenham, Kent.

MOLLIE BARR.

MALLEOLAR FRACTURES

SIR,—I cannot agree with Mr. Bonnin (Aug. 20) that we should doubt the histories given by patients with fractures of the external malleolus. I am far more sceptical of Thorndike's findings and of the results of cadaveric experiments.

Thorndike [2] diagnosed 415 cases of sprain of the ankle in college sportsmen over a period of six years. He claims to have located the sprain to a particular ligament in 317 cases. In 195 cases this was the anterior inferior tibiofibular ligament; in 61 the lateral collateral ligament; in 38 the medial collateral ligament; and in 23 the anterior tibio-astragaloid ligament. He does not subdivide the lateral collateral ligament and makes no comment on the distinction between sprains of its anterior fasciculus and sprains of the anterior inferior tibiofibular ligament. Furthermore, while claiming that any sprains especially involving the anterior inferior tibiofibular ligament will give a permanently weakened and widened mortise to the joint, he also claims that the average period of disability of all the ankle-sprains of the series was $8^1/_2$ days before return to full play in sports.

Mr. Bonnin refers to experimental work on the relation of the shape of the fracture-line to the mechanical stresses. But it does not follow that a particular fracture-line is not produced by a particular force simply because this has not been observed experimentally. For instance, Hönigschmied [3] had 21 cases of dorsiflexion strains in his experiments on the cadaver, but, for fairly obvious reasons, in none of these was an anterior marginal fracture of the tibia produced; yet such a fracture we reduce and fix in plantar flexion because we t it to be produced by dorsiflexion. He had 17 cases adduction strain, yet in none was there the so- first-degree adduction fracture. Dupuytren had results. Thus it does not seem unreasonable to the unbiassed history of an "unbadgered" patient.

Mr. Bonnin classified my groups 2 and 3 as "addu fractures, and my group 1 as external-rotation in Yet, as I previously pointed out, I have seen of the group 2 or 3 type associated with group-1 fr and apparently due to the same recent injury.

Lastly, Dupuytren did not contend that most of the external malleolus consequent on indirect vi and unassociated with other bony or complete l injury in the region of the ankle, are due to in strain. He thought that isolated fractures of the were a rarity, and he discourses on them as follows [4]:

> "It is at this spot therefore [$2^1/_2$ in. above the lo extremity of the fibula] that the least resistance is offe and that the causes capable of producing fracture act most advantage, as for instance in forced eversion of foot. Lastly, the fracture sometimes occurs below wh the ligaments connect the tibia and fibula together then it is rather a fracture of the malleolus and is consequ on inversion of the foot."

Dupuytren, incidentally, emphasised the importance muscle-pull in producing displacement in fractu dislocations of the ankle, in contradistinction to emphasis we now place on the causative violence. Perh we go too far in allocating one type of fracture-line one type of violence irrespective of the extent of associa lesions.

Scunthorpe.

DAVID THOMAS

PARA-AMINOSALICYLIC ACID IN TUBERCULOS

SIR,—Dr. Swanson's letter in your issue of July draws attention to the hypoprothrombinæmic effect *p*-aminosalicylic acid (P.A.S.) therapy in 5 out of patients with rheumatoid arthritis—an effect which points out is well known to occur during the exhibit of other salicylates.

This dicoumarol-like effect of other salicylates can prevented by simultaneous treatment with vitamin K one of its synthetic analogues; but when salicyl hæmorrhage has already taken place vitamin-K ther is unlikely to be effective.[5] It seems reasonable assume that in these respects P.A.S. resembles ot salicylates.

Meanwhile, some patients with tuberculosis are be treated with both P.A.S. and streptomycin. In th patients the possibility of hypoprothrombinæmia appe to be increased because of the bacteriostatic effect streptomycin on *Bact. coli* in the gut and the consequ decrease in the supply of vitamin K from this bacte source.

The problems of the mode of therapeutic action P.A.S. are still unsolved, though Le [illegible] bacteriostatic action to its rôle as a [illegible] of metabolites of the tubercle bacillus, these metabol possibly resembling salicylic and benzoic acids. At t stage, when trials of combined P.A.S. and streptomy are no doubt in progress, it may be worth draw attention to three considerations, not necessarily inco patible with Lehman's view. The first is that t vitamin K first used therapeutically in man was obtain from the pigment of the tubercle bacillus,[7] and it m therefore be assumed to play a part in the metaboli of the bacillus. The second is that the dicoumarol-li hypoprothrombinæmic action of salicylates on the li is possibly an anti-vitamin-K effect. The third, whi gests that prevention of the anticoagulant effect of a notherapeutic drug is not necessarily desirable, is tained in a statement by Prof. A. St. G. Huggett[8] the Biochemical Society, that the anticoagulation enzyme action of some trypanocidal dyes may have nalogy to their mechanism as trypanocidal agents.

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[1] Glenny, A. T., Llewellyn-Jones, M. The Intracutaneous Method of Testing Diphtheria Toxin and Antitoxin. *J. Path. Bact.* 1931, 34, 143.

[2] Thorndike, A. Athletic Injuries. London, 1942.

[3] Honigschmied, J. H. *Dtsch. Z. Chir.* 1877, 8, 239.

[4] Dupuytren, G. Diseases and Injuries of Bones. London, 18

[5] See annotation, *Lancet*, 1943, ii, 419.

[6] Lehman, J. *Ibid*, 1946, i, 15.

[7] See leading article, *Brit. med. J.* 1939, ii, 1232.

hus in therapeutic trials with combined P.A.S. and ptomycin it appears worth considering that any oprothombinæmic effect observed may represent a ter hazard to the tubercle bacillus than to its host. ould then be possible to make a comparison between ients risking hypoprothrombinæmia but safeguarded serial prothrombin estimations, and those given a plement of vitamin K.

trevor, co. Down. J. A. FISHER.

EMPLOYMENT OF ELDERLY PERSONS

IR,—The explanation of the conditions on which tional Insurance retirement pensions are paid, con- ied in your leading article of Sept. 10, is correct only spect of persons who reached minimum pensionable before July 5, 1948, and accordingly qualified for ir pensions under the old Contributory Pension Acts. e effect of the new National Insurance arrangements the willingness of elderly people to continue at work bviously a matter of considerable national importance, d I hope, therefore, that you will allow me to explain very different arrangements which apply to those ching pensionable age after July 5, 1948.

Assuming that the contribution conditions are fully isfied, a man may claim a retirement pension of 26s. m the age of 65 provided he has retired from regular ployment, inconsiderable occupations being ignored r women the qualifying age is 60). A man who does retire until after age 65 now goes on paying National urance contributions in exactly the same way as he before and remains entitled to sickness or unemploy- nt benefit at the same rate as pension, so that any nporary interruption of earnings after minimum nsion age provides no temptation to claim the retire- nt pension. For every 25 contributions paid in ployment after his 65th birthday the rate of pension yable from retirement is increased by 1*s*. a week. the man's wife has already reached 60 her notional nsion-rate (including that payable to her as a widow her husband dies before her) is also increased by 1*s*. every 25 contributions he pays. It is possible, erefore, for a man who goes on working until he is 70 acquire the right to a pension of 36*s*. a week for nself, and one of 26*s*. a week for his wife during his etime and 36*s*. thereafter. The increased rates of nsion payable in this way are, taking one case with other, actuarially broadly equivalent in value to the m of the pension forgone by postponing retirement d the contributions paid after minimum pension age. e arrangements therefore achieve the objective of the ggestion referred to in your leading article. From e 70 (65 for women) the increased rate of pension rned by postponed retirement is payable uncondi- onally whether work continues or not. As a reinforce- ent of the retirement condition, where pension is aimed on retirement before age 70 (or 65, as the case ay be), its payment up to that age is regulated by an rnings rule the effect of which is to reduce the pension aid for any week by 1*s*. for every 1*s*. of net earnings ver £1 in that week.

The general objective of the provisions of the new National Insurance Act is, of course, to encourage all those who can to continue in regular work wherever possible up to age 70 or even beyond. It may interest your readers to know that at the present time about two-thirds of the insured men reaching minimum pensionable age and nearly one-half of the insured women do not claim their retirement pensions, because they are continuing in regular work until later.

Ministry of National Insurance,
London, S.W.1.

F. D. BICKERTON
Chief Press Officer.

VITAMIN E

SIR,—With regard to the letter from Professor Boyd and others (July 16), may I quote experimental data ? R. L. Holman[1] observed that, in dogs, vitamin E (3 mg. per kg. body-weight) had a significant protective action against hyperlipidic arteritis ; while Tusini[2] administered to rats altogether 5 mg. of ergotamine tartrate and found that the ensuing arterial spasm in the tail was, in over 90% of the animals, almost completely inhibited by giving 20 mg. of vitamin E daily. A synergistic action between vitamin E and vasodilators was also demonstrated, with very interesting therapeutic results.

Perhaps these results may lead to clearer judgment of the " extravagant claims " from the Shute Foundation.

Milan. V. FERRERO.

WHOOPING-COUGH TREATED WITH CHLOROMYCETIN

SIR,—Your leading article of Sept. 10 prompts me to report what may well be the first case of whooping-cough treated in this country by chloramphenicol ('Chloromycetin ').

My daughter, then aged $5\frac{1}{2}$ months, developed whooping-cough about the beginning of May this year and was in the early paroxysmal stage towards the middle of the month. Her older brother and sister had contracted the disease at the beginning of April and were by then well advanced in the paroxysmal stage. The infant was fully breast-fed and had been kept away from her brother and sister as much as possible, but of course some contact was inevitable.

Although her general condition was good, the attack was becoming fairly severe ; paroxysms became frequent, especially at nights, and during the two nights before treatment was started they occurred about every thirty minutes and often ended in vomiting. As good results with chloromycetin in whooping-cough had been reported from the U.S.A., and as the toxicity of the drug was supposed to be very low, I decided to try its effect while the baby was still in good condition and free from complications.

The drug had only come on the market during the previous week, and the dosage recommended was approximately that for typhoid fever—i.e., initially 50 mg. per kg. body-weight, followed by smaller amounts three-hourly. Chloromycetin being made up in 250 mg. capsules, I decided to give one capsule four-hourly as the baby was on four-hourly feeds. Her weight was then about 6–7 kg. Administration proved very difficult, since of course an infant cannot swallow these capsules. We tried to give the powder first in orange juice and then in expressed breast-milk. Both methods proved impossible because of the extreme bitterness of the drug ; the smallest taste of it made the baby retch and cry. We therefore decided to use an œsophageal catheter and found it easiest to introduce this through the mouth ; a good hearty cry assured us that it was in the right place. The first time we attempted this immediately after a feed, and the whole feed was brought up ; after that we gave it half an hour before each feed, when the stomach was presumably empty. This was successful and from that time on the baby retained the full amount of drug given and continued to feed normally. Because of these difficulties we continued to give 250 mg. four-hourly, up to a total of seven doses. Already after twelve hours the effect was noticeable, and the following night paroxysms were down to one every two or three hours. The drug was stopped as it was causing some colic and diarrhœa ; this subsided in twenty-four hours.

The effect on the whooping-cough was dramatic. After thirty-six hours the paroxysms stopped completely and the baby was obviously improving. The cough remained, and for many weeks the baby had occasional attacks of coughing, which, however, never gave rise to the slightest anxiety ;

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[8] See *Lancet*, 1941, ii, 761.

[1] *Proc. Soc. exp. Biol. N.Y.* 1947, 66, 307.
[2] *Atti Soc. Lomb. Sci. Med. Biol.:* Meeting of March 11, 1949.

she was never sick again, and she continued to make good progress. *A smaller dosage after the initial dose and a longer* course of treatment might possibly have averted the toxic symptoms and also abolished the cough.

There is no doubt that chloromycetin stopped what seemed to be developing into a severe case of whooping-cough. If this experience is confirmed by others—and I have already heard of one other case treated with good effect—whooping-cough should lose its dread. Its use will probably have to be confined to infants and severe cases at first because of the scarcity and high cost of the drug.

Hounslow, Middx. D. P. DEGENHARDT.

THE REGISTRAR'S SALARY

SIR,—As a junior registrar about to leave the hospital services, I should like to draw your attention to a plight which I feel must be by no means unique.

I *qualified just over four years ago*, served my houseman's apprenticeship, and studied for and gained the M.R.C.P. I entered the Services and served my two years. On release I approached an organisation mainly designed to "resettle" the medical ex-Serviceman, and was offered a year of subsidised cups of tea in a supernumerary capacity. Instead I sought, and took on, a junior registrarship, and in that position have been ruining my health for a net salary of £7 16*s.* 2*d.* weekly, after deduction of emoluments, tax, superannuation, &c. Of this salary 9% must be spent on the books and subscriptions necessary to the maintenance of my standards. I do not pretend to a car—I have only been qualified four years.

Now, if I take on a registrarship, my salary will rise to the giddy height of £775 per annum—i.e., about half the average G.P.'s income and under a quarter of the average dentist's. But then I become non-resident and must buy and keep up the car I have so long dreaded. As a responsible family man I have gone into my financial prospects and find that my net income, after the usual deductions at source, will be just under £600.

Well, I have remained shabby long enough—I am leaving for the comparative opulence of general practice, where incidentally I shall probably be able to afford an entire half-hour for my meals, and shall get decent food into the bargain. I shall be leaving with some relief; at least I shall be able to support my wife and child decently. But I shall bear a life-long grudge against the allegedly reformed system that drove me to do so.

Yet for all this I can blame no-one but myself and my peers for our cowardice and apathy in preserving a shabby dignity that baulks at organising to fight for our social rights—how else shall we get them?—and, above all, for our tacit condonation of a system that emphatically does not encourage "ability without means," but unopposedly exploits the competition for academic advancement and imposes on the less fortunate of us the crippling burden of chronic financial worry.

London, N.W.3. A. GEE.

*** During his training, and until he gained a sufficient reputation, the young specialist has always earned less than he could get by going into general practice; and men who married soon after qualification have almost always been obliged to abandon their intended specialty unless they had private means. The position has changed to the extent that hospital registrars, instead of receiving £300–400 or less, as before the war, are now on a scale rising from £670 to £1300, and on gaining staff appointments they immediately earn a minimum of £1400. The fact that this remuneration is lower than that generally obtainable (under quite different conditions) in general practice has to be weighed against the later advantages of the consultant's life, which include the possibility of a much higher income than that of the practitioner. We must regret, on all grounds, that any young doctor should feel obliged to enter general pr when his heart is elsewhere; but we would point o our correspondent that under the "allegedly refo system" he has at least an opportunity of continuin training, whereas formerly he would have had none —Ed

THE DOCTOR'S PROFESSION

SIR,—In the third article of this excellent serie following sentence occurs on p. 338 (Aug. 20): "Alt he is no longer normally required to take the Hippoc Oath, the doctor is bound to respect human life i its forms." If this basic obligation is to be met profession must keep clear of bacteriological warfar other military work. It seems necessary that wh medically qualified person is engaged on such wor should recognisably separate himself from the profe in the way that a doctor does who changes fro medical to a combatant rôle in the Forces. If th not done the public will be alarmed and a Governm might come which would demand destructive wor part of the profession's duty. I suggest that do who do such work should be, for the time, seconded the profession with the right to return to it when have finished destructive work.

London, W.1. J. M. ALSTO

RESEARCH

SIR,—With regard to the reference in your lea article of Sept. 3 to the use of endowment funds research purposes, I would like to inform you that board of governors at this hospital decided, sh after the introduction of the National Health Ser to earmark for clinical research at least two-third the annual income from endowment-fund investmen

Middlesex Hospital,
London, W.1.

DAVID H. PATEY
Chairman, Medical Committ

POLIOMYELITIS AND TONSILLECTOMY

SIR,—Acute anterior poliomyelitis following sho after tonsillectomy may be due to the entry of infec through the wounds in the throat.

But there is a wider problem. Some evidence sh that the tonsils and other subepithelial lymph-gl can confer some degree of immunity against cer infectious diseases even when the disease itself is contracted; and the mechanism by which they c do this has been demonstrated. Whether faucial nasopharyngeal tonsils function in this way aga poliomyelitis where the disease is endemic is a ques ripe for investigation.

Last year Glover[1] published a valuable collectio evidence on the relation of tonsillectomy to poliomye But much of the work refers to tonsillectomy *rece* performed, where infection through the open wou is a possibility. One would like more figures on incidence and severity of the disease in patients have had tonsillectomy performed more than six mon previously.

The removal of tonsils and adenoids leaves for a t three open wounds through which infection can enter body. It may also be expected sometimes to cause almost unnoticeable attack that may confer immun It is therefore desirable to know not only whet and when tonsils and adenoids have been remov but also whether the disease was prevalent locally at time of removal.

Every doctor who has a case of poliomyelitis mi make a point of recording these data. The compil of statistics from such data and the drawing of conclusi from them will be a complicated task requiring mu care.

Bromley, Kent. KENELM H. DIGBY

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[1] Glover, J. A. *Bull. Min. Hlth, P.H.L.S.* 1948, 7, 150.

WHY I SHOULD MOVE

R,—Few people realise that a grading of senior ital medical officer or lower carries with it no native but to seek another appointment. For me means selling up my home and moving my family myself away from friends, colleagues, and the ict of our choice. For many it entails also moving ren away from selected schools and breaking up a established private practice.

sultants not threatened by such an impasse ely can realise the magnitude of this disaster. The ster has promised us that we should not be forced ove. The appeals committees lightly take it upon elves to compel it: appeals committees of much ised composition who prefer to remain unknown. e to interview applicants, and spurn local advice.

hy have so few consultants protested against the rice of this procedure, an injustice they must all seen operative among their immediate colleagues? hopes it is largely because they fail to realise the cations of this final assessment. Many point to statement "I should add that this grading may be ewed during the next few years." Let them note it contains no promise to review, and that the r hospital medical officer will have then no further ts to consultant status than he has today and far chance of moving. No, he must move today. Old young have this one solution. Their turn will not e by waiting.

ny consultants still believe that there will be a ter appeal. This can only come if they stand fairly squarely behind their less fortunate colleagues. commendation for adequate appeals machinery to et up should be sent from every specialist individually is college and from every group medical advisory mittee to the regional medical advisory committee, regional and central consultants' and specialists' mittee, and all other interested bodies.

hester, Sussex.   JOHN D. WHITESIDE.

PREVENTION OF BURNS

R,—Why is there always such a time-lag between announcement of scientific advances and their prac- application? In the sphere of medicine, is it use practitioners are not adequately informed about ress, or is it because the profession is unable to ess its views sufficiently unitedly and effectively in places where appropriate action can be taken to fit the community at large?

alarial control has been possible for a long time, at t in circumscribed areas; but often in British onies the immediate cost has prevented action, fficient account being taken of the likely ultimate efit to the economy of the territory. (The Panama al zone provides a striking instance of this, though ewhat artificial conditions exist here.) As far as I aware only the United Fruit Company has made a parison between the direct costs of effective anti- arial measures and the ultimate financial advantages n them; however, the work initiated by Dr. Cheverton ughout Cyprus should within the next few years vide further data.

The article by Dr. and Mrs. Colebrook in your issue of y 30, on the prevention of burns, aptly reviews a ation allowed to develop under our noses and partly direct violation of the law of the land. Recent erience has emphasised that legislation opposed by e public tends to become ineffective. The Colebrooks tly appeal for propaganda to remedy the public's ning ignorance of the issue of life and death involved the prevention of thermal burns. Irrespective of such propaganda, the results of which are notoriously difficult to assess, much could be done by simple legislation, on the lines indicated by Dr. and Mrs. Colebrook, which probably would be of greater direct benefit to the community than much of the legislation occupying Parliamentary time at present.

London, W.1.   W. R. THROWER.

SIR,—Mr. Moncrieff's summary (Sept. 10) of the fire-proofing problem from the point of view of the textile chemist will have been appreciated by many readers who are concerned about the risk of burns associated with highly inflammable clothing.

It would be improper for me to comment upon the purely technical points he makes, but perhaps I may legitimately refer to an assertion by him which has more to do with human nature than with textiles. He says: "There is no easy solution to the problem of making cotton, wool-cotton mixtures, or viscose rayon fabrics non-inflammable: if there had been it would doubtless have been adopted."

Is there really no room for doubt about this? If Mr. Moncrieff has read the evidence given before the *Home Office committee (the evidence is much more* important than the committee's final report) which in 1910 was considering the dangers of flannelette and the merits of a virtually non-inflammable form of that material impregnated with stannic oxide—which was at that time on the market—he cannot have failed to notice that the witnesses representing the flannelette industry, other than the one firm concerned in the production of the fire-proofed variety, were quite openly and strongly opposed to the introduction of the safe material.

The nature of their opposition is important. They did not maintain that the "handle" of the safe material had been adversely affected; nor that its wearing capacity was diminished (the only evidence of this was a single letter, while on the other hand the testing house of the Manchester Chamber of Commerce reported the wearing capacity of the proofed material substantially increased); nor did they oppose the proofed material because it failed to maintain its non-inflammability after washing (that was clearly disposed of by the many experiments of the Government chemists and of the British Fire Prevention Committee).

The flannelette makers opposed the introduction of the proofed material chiefly on two grounds: (1) that the price to the retail buyer was higher than that of the untreated materials, and that this was not in the public interest; and (2) that it was unfair to the makers of flannelette to single out this material when other "cottons" were just as inflammable. The sales of flannelette had, they said, already been seriously affected, and the future of a number of firms making the material might become precarious if the demand for this safe fabric—made under patent by one firm—became established.

It is difficult after reading all the evidence given to resist the conclusion that the stannic-oxide fire-proofing process, as used in 1910, had produced a safe flannelette which was, if not completely, at least almost completely satisfactory; and that its adoption was "killed" chiefly by the opposition of the other flannelette manufacturers who—being only human—were more concerned about the success of their business than about a rather uncertain number of accidents to children they had never seen. I suggest that if these manufacturers had got together in 1910, and had agreed to settle the difficulty over patent rights and to improve the fire-proofing process if it was not already perfect, we should long ago have had children and women clothed in non-inflammable materials, with the result that thousands of deaths and of ruined lives would have been avoided.

I am aware that a considerable amount of research has been carried on since 1910 with the aim of producing fire-proofed fabrics, for military and industrial purposes, but I understand that it has usually had an objective rather different from that in question here—namely, to produce a fabric which was weather-proof as well as fire-proof. May it not be that the stannic-oxide method was in fact reasonably satisfactory for the limited objective of safeguarding children's clothing, although it would have been useless for weather-proofing?

In view of the urgency of this matter, now that we have sure knowledge about the frequency of these tragic accidents (about five a day in England and Wales—i.e., about 1800 a year—of which more than 25% are fatal) would it not be well to settle once and for all the merits or demerits of the stannic-oxide-proofed material by preparing a few dozen yards of it and submitting it for careful examination by a panel of people who have no financial interest in it? If the material proves unsatisfactory, then let us decide whether, in the light of modern knowledge about fire-proofing, the availability of raw materials, and other considerations such as cost, it is best to pursue the search for better methods of fire-proofing cotton fabrics or to focus attention on alternative *materials* such as woollens, 'Nylon,' and viscose rayons.

While the search for the ideal material is going on (it may take some years) I submit that it would be better to offer the public at least the opportunity to buy some relatively safe substitutes for the manifestly unsafe materials now on the market.

Finally, I respectfully suggest that it would be valuable if the evidence as well as the final report of the 1908–10 Home Office committee could be republished. At present it is available only in very few libraries (the Royal Society of Medicine has one copy), and the evidence is presented in an extraordinarily inconvenient form, being interspersed with quite irrelevant matter about the law relating to coroners. (Report of the Departmental Committee on Coroners. H.M. Stationery Office. 1910.)

Farnham Royal,
Bucks.

LEONARD COLEBROOK
Formerly Director, M.R.C. Burns Unit.

FOREIGN BODY IN THE ABDOMEN

SIR,—The case reported by Mr. Travers in your issue of Sept. 10 reminds me of an even more interesting case.

A married woman of 51 reported with a history of lower abdominal pain starting in the right iliac fossa five days previously. She had noticed a subumbilical swelling over the same period. There was no constitutional disturbance apart from a poor appetite. Her doctor diagnosed an ovarian cyst.

The patient appeared well in herself and had walked up to the outpatient department. A slightly tender spherical swelling, some 3 in. in diameter, was present below the umbilicus. She was too stout for accurate diagnosis.

A few hours after admission a definite blush of the overlying skin was observed, and subcutaneous abscess was diagnosed. After incision and evacuation of the pus, digital exploration revealed a fish-bone-like object, some $^3/_4$ in. long, sharp at one end, lying on the rectus sheath. Penicillin injections were given in view of the possibility of erysipeloid. Convalescence was uneventful, the abscess cavity being clean and ready for secondary suture in ten days.

On being shown the offending object, the patient exclaimed: "Ah, that's an eel bone; we have eels every Sunday."

In this case, therefore, the bone had not only escaped from the bowel and traversed the peritoneal cavity but had perforated the whole thickness of the abdominal wall before calling attention to itself. Enterococci and *Bact. coli* were grown from the pus.

Mile End Hospital, London, E.1. S. WILLSON HOLMES.

MEMORIAL TO C. J. BOND

SIR,—In their letter last week, Dr. Walker Mr. Spriggs, writing of the fund which is being in Leicester to provide a memorial to the late C. J. make no reference to what was undoubtedly one great interests in the later years of his life—the qu of voluntary euthanasia.

He took a leading part in the formation of the Vol Euthanasia Legalisation Society, and was the chairman of its executive committee—a position until his death. It was at his personal invitatio the late Lord Moynihan became the first p the new society, and doubtless it was largely due great prestige attaching to Bond's and M names that the society made the rapid progress in securing the adherence and support of so many distinguished members of the medical profession.

No review of Bond's life and work would be without a reference to this aspect; and possibly years to come he will be chiefly remembered and for the great part he played in the initiation o reform.

C. KILLICK MILLARD
Hon. Secretary,
Leicester. Voluntary Euthanasia Legalisation Soc

Public Health

Poliomyelitis

IN the week ended Sept. 10 notifications in E and Wales were: poliomyelitis 284 (280), encephalitis 22 (19). Figures for the previous we shown in parentheses.

Multiple cases (poliomyelitis and polioencep together) were reported from the following cou London 31 (43), Berkshire 4 (5), Chester 6 (3), Co 3 (5), Derby 2 (2), Devon 5 (7), Dorset 5 (2), Du 7 (8), Essex 16 (21), Gloucester 10 (13), Hereford Hertford 5 (3), Kent 9 (10), Lancaster 38 (28), Lei 7 (11), Lincs, Kesteven 2 (2), Middlesex 19 (18), umberland 8 (10), Nottingham 16 (6), Oxford Soke of Peterborough 5 (0), Somerset 3 (9), Southa 15 (10), Stafford 4 (3), Surrey 9 (7), Sussex, East Warwick 10 (8), Isle of Wight 2 (0), Wiltshire Yorks, *East Riding* 3 (1), Yorks, West Riding 25 Glamorgan 7 (5), Monmouth 2 (1).

Notifications in England and Wales in the sponding week of 1947 (week ended Sept. 6) poliomyelitis 662, polioencephalitis 46. These we highest weekly figures recorded in that year.

Typhus Fever in a Ship

S.S. *Monte Montjuich* arrived in the Port of L from Melilla (North Africa) on Aug. 17. Two me of the crew were admitted to hospital with susp enteric fever on Aug. 22, and a third on Aug. 25. vessel then sailed for Newport (Monmouth) and a on Aug. 28, when a fourth member of the crew wa to hospital with a similar diagnosis. Two f cases occurred on Sept. 6, while another member o crew was under treatment in hospital for midd disease.

All sanitary measures were taken on board, a addition fumigation was carried out in Newport, 803 rats were destroyed. The ship sailed for Ro Argentina, on Sept. 7.

The laboratory tests on these cases proved ne until Sept. 2, when Widal tests on the first two pa suggested infection with *Salmonella paratyphi-B.* Sept. 7, however, a repetition of the Weil-Felix on serum from the seven patients proved positiv typhus infections, but further investigation on boar not possible as the ship had sailed that morning. the patients are recovering; the attack was mi every case. There was no evidence of lice infesta

It is not yet apparent whether the infection w murine or louse-borne origin. Spread in the British is not expected.

Obituary

AUGUST KROGH

the death in Copenhagen of August Krogh, news ich reached this country last week, physiology has n outstanding figure. He was born in 1874, and as ld showed a lively interest in small animals and te—an indication of that spirit of inquiry which to direct all his future work. He took his degree in gy at the University of Copenhagen in 1899, but he already been working as a student in Christian 's physiological laboratory and he now became his tant. Some years later he was appointed to the rsity chair of zoophysiology. From he learnt much about the analysis es, and this stimulated his interest ethods of accurate investigation quantitative analysis which he was on to develop in so masterly a way. etter illustration of this can be d than in a paper published in on the possible formation and ation of free nitrogen by the al, which, in disproving this hypo- s, is a model of technical skill and al reasoning. The same elegance chnique, aided by his knowledge ology, is shown in his physio- al researches on insects, to which turned at intervals during his e life. But he will be more widely mbered for the great contribution h he made to the physiology of higher animals and man in that field embraced in the term spiration."

ith his wife he spent the summer in Greenland studying the diet metabolism of Eskimos, who, owing e rigour of the climate, are for long periods obliged bsist almost entirely on fish, seal meat, and fat. e of the difficulties of an improvised laboratory he able to throw much light on this nutritional problem a study of the respiratory exchange and nitro- us metabolism. Ten years later, in another metabolic y of the respiratory exchange, which exemplifies the eme care which he devoted to the planning and uct of his experimental work, he showed that fat ed as a source of muscular energy somewhat less ently than carbohydrate.

a series of papers published in 1910 he reached the lusion that the passage of gases between the blood air in the lungs can be adequately explained by ple gaseous diffusion, without recourse to the theory active secretion of gases which had been advocated others, basing his views in large part on the results ined by new instruments which he had designed for mining the gas tensions in the blood. In the following s he was to devote much attention to the problem of regulation of breathing, and he contributed numerous ers on this subject and on the physiology of muscular rcise.

In 1912 he introduced a surprisingly simple technique determining the blood-flow through the lungs of man. ich depended on the inhalation of nitrous oxide and the asurement of the amount of this gas carried away from e lungs in solution in the blood. With the substitution acetylene for nitrous oxide this method has with slight modification been used by many investigators studying the cardiac output during rest and muscular ercise.

It was while writing a monograph on the Respiratory xchange of Animals and Man (London, 1916) that rogh's attention was drawn to the capillary circulation. uring severe exercise the oxygen consumption of the tive muscles may increase to some twentyfold the resting gure, and it seemed to him that the requisite variation n oxygen supply to these muscles could not be satis- actorily explained by the assumption that the blood asses through a fixed system of capillaries with a corre- ponding variation in velocity, but that the condition ould be better met if some capillaries only were functional during rest and that capillaries which were p viously closed could open up to allow the passage a larger flow of blood as occasion demanded. This le him to his detailed studies of capillary circulation and to the theory of the functional alteration of the capillary tone, a conception akin to that reached by Dale and Richards in this country in 1918 by a different line of argument in their investigation of the effects of histamine. A full account of his researches in this field was given by Krogh in his Silliman lectures delivered at Yale University and published under the title The Anatomy and Physiology of Capillaries in 1922 (2nd ed. 1929). In 1920 the great value of his researches was recognised by the award of a Nobel prize.

[C. Ess

After the discovery of insulin Krogh was largely responsible for its introduction into Denmark and for arranging for its manufacture in that country. In his later years he became interested in the osmotic regulation in aquatic animals which formed the title of a monograph published in 1939, and in the passage of ions through the surface of living cells which was the subject of his Croonian lecture to the Royal Society, of which he had been elected a Foreign Member in 1937. Although he retired from his university chair in 1945, he continued working until the end, and only last summer took part in a conference in Cambridge held in memory of Sir Joseph Barcroft.

To mention but briefly some of the most prominent fields in which Krogh worked gives, however, no adequate impression of his ability. No-one who reads his scientific publications can fail to admire his technical skill and versatility, and to appreciate the amount of thought which he devoted to all his experimental investigations. He himself has claimed that he owed much to his natural gift for visualising even complicated apparatus and the details of its working as well as the physiological processes which might be involved, for this enabled him to develop hypotheses which could then be put to the test of experiment. Apart from his own contributions to physiology his influence and inspiration are evident in the work of all those who were privileged to be associated with him.

Critical of others, but without malice, he was critical, too, of himself. His shyness concealed a real gift for friendship, and those who knew him well could appreciate his personal charm and quiet humour. It was only natural that he should have early in his career formed a lasting friendship with J. S. Haldane and Joseph Barcroft, whose interests lay in the same sphere as his own; but very many others both in this country and in America could claim his friendship too. So much of his work was devoted to the subject of human physiology that he had a very clear conception of the significance of this to medicine: indeed he regarded human physiology as the basic science for the profession of medicine, and he was much in favour of coöperation between the teachers of physiology and the teachers of medicine and surgery in the medical schools.

C. G. D.

HENRY HENDERSON MOLL

M.D. LEEDS, M.D. ROME, F.R.C.P.

Dr. H. H. Moll, senior physician to the General Infirmary at Leeds, died suddenly in the Brotherton wing of the hospital on Sept. 8.

Of Scottish and Italian descent, he was born in Italy in 1896 and received his early education in Milan. He proceeded to the University of Pavia and later to Rome for the completion of his clinical studies, graduating M.D. at the latter university in 1918. In 1920 he visited England and studied for two years at St. Bartholomew's Hospital, London.

Family ties in Yorkshire led him to apply for the post of resident medical officer at the General Infirmary. His successful tenure of this key appointment opened the way to consulting practice; and in 1924 he obtained the M.R.C.P., followed by the degrees of M.B. and M.D. of the University of Leeds. In 1932 he was appointed an assistant physician to the General Infirmary at Leeds and hon. physician to the Leeds Public Dispensary and Hospital.

During the period of postgraduate study in London, he became interested in diseases of the chest, and whilst holding the appointment of medical tutor in the University of Leeds he established a large clinic for the study of asthma. This work, which was coördinated with the national investigation, retained his active interest. Shortly before his death he was planning for the reopening of the clinic, closed on account of the war, and for the establishment of an inpatient centre at Pinderfields Hospital for the study of asthma, allergic diseases, and infective conditions of the chest. Of his published work, perhaps the best known is that on bronchiectasis which appeared in the *Quarterly Journal of Medicine*. He was elected F.R.C.P. in 1938, shortly after his appointment to the full staff of the General Infirmary, where last year he became senior physician.

He married, in 1935, Francesca Teresa Soldi, the artist, and is survived by his wife and four children.

A man of wide reading and intensely interested in the advancement of medical knowledge, his sudden death is a loss to the profession. R. E. T.

ANNIE McCALL

M.D. BERNE

Dr. Annie McCall, founder of the Clapham Maternity Hospital, London, was a very remarkable woman and a most forceful character. She studied in the early days at the London School of Medicine for Women, taking her M.D. at Berne in 1885. She had her obstetrical training mainly in Vienna and she devoted nearly all her life to the practice of this branch of medicine and to the training of women medical students and nurses in practical midwifery.

In 1889 she founded the Clapham Maternity Hospital by her own efforts and with the help of those friends who were interested in the advancement of women's education. From there many doctors and nurses went abroad to the mission fields, and women also came from overseas to be trained as midwives. Throughout its long history the hospital was never allowed to be in debt—owing to the personal supervision and administrative ability of Dr. McCall herself. She was the supreme head, and no details of its management were too small for her.

She practised conservative midwifery, allowing as little interference as possible with the course of labour. Her results were remarkable, and puerperal sepsis was of the rarest occurrence in the hospital. Masterly inactivity was the watchword and she enforced the constant supervision of the patients by those who were in attendance. As a consequence, the maternal mortality and stillbirth rates were remarkably low. The only interference permitted was the application of obstetric forceps when approved by Dr. McCall herself or her senior assistant. She ruled her staff with a firm hand, and many women doctors and nurses who were trained by her learned to appreciate the value of conservative methods. Caring little for the opinion of others, she had her own code of conduct. She was a law unto herself, and insisted on maintaining obedience to her direction among her staff. She was a great believer in the value of fresh air and open windows, even when a gale might blow papers about, and in addition to her obstetric work she was a pioneer in the treatment of pulmonary tuberculosis, establishing a small sanatorium at Rudgwick, in Sussex, for open-air treatment. She lived in Clapham Road, where she housed medical students and enjoyed occasional relaxation in her beautiful garden.

Dr. McCall was a rigid advocate of temperance, and never allowed alcohol to be used in the treatment of patients; at meetings she sometimes spoke with great conviction on the subject. She had much sympathy for the plight of unmarried mothers and their inability to find accommodation for their confinements other than at the workhouse infirmary.

At the Clapham Maternity Hospital she was helped by her cousin, Miss Ritchie—a woman of great culture and boundless sympathy and gentleness, who was much beloved and who often softened forcible directorship of Dr. McCall. Both of women must be remembered as having done for obstetrics, especially during a period whe branch of practice was looked upon as beneath the of the physician and surgeon—a period, now past, it was thought bad form in social life to mention nancy or childbirth. One was always impressed their earnest endeavour to make the world a better for mothers. Dr. McCall died at Rudgwick on S aged almost 90. A. I

REGINALD ERNEST BICKERTON

D.S.O., T.D., M.B. VICT.

Colonel Bickerton, ophthalmic surgeon to the Se Hospital and consulting ophthalmic surgeon t Evelina, the Royal Waterloo, and other London hos died on Sept. 13 at his home in Portland Place, wh had practised for many years. The son of T Bickerton, F.R.C.S.E., of Liverpool, he was bo Dec. 16, 1870, and after [illegible] sc Durham went to the [illegible] ol, hamsted. On leaving school he went to live wi half-brother, Mr. T. H. Bickerton, F.R.C.S., in Live and began his medical training at University C Liverpool, qualifying in 1895. Having held v house-appointments at the Royal Infirmary, he the many other Liverpool medical graduates, went to America as a ship's doctor. On his return he seriously to ophthalmology, in which he was a interested, and worked in Vienna, Berlin, and before coming to London to gain further experie Moorfields and elsewhere. He early secured an ho appointment at the Seamen's Hospital, and followed. Meanwhile he had become an active sup of the Territorial movement. He was a c R.A.M.C. (T.) by 1912, and was mobilised on A 1914, to serve successively in France, Egypt, Sal and Turkey. He commanded a field ambulance 1916, was ophthalmic specialist to the British Sa Force, and was acting A.D.M.S. to the Army of the Sea. He was twice mentioned in despatches, an awarded the D.S.O.; from 1927 to 1932 he was surgeon to the King.

Outside ophthalmology Colonel Bickerton had interests. In youth he was a keen yachtsman, a skill with the banjo made him a popular figure at h and other gatherings. When he came to Lond took up motoring, at that time in its earlier p Throughout the late war he remained in active p in London, and though his health became indiffer continued almost to the end of his life to see a his old patients. Many will remember him f kindliness, gentleness, and courtesy. He was cha of the Royal School for the Blind at Leatherhead.

He married Constance Livesey, who survives hi a son and a daughter.

Births, Marriages, and Deaths

BIRTHS

AIREY.—On Sept. 12, the wife of Dr. G. O. Airey—a son.

LEECH.—On Sept. 12, at Axminster, the wife of Dr. K. W. —a son.

PHIBBS.—On Sept. 10, the wife of Dr. P. A. T. Phibbs—a da

ROTHWELL.—On Sept. 8, at Bury, Lancs, the wife of Dr. Rothwell—a daughter.

WAUGH.—On Sept. 16, in London, the wife of Mr. William W F.R.C.S.—a daughter.

MARRIAGES

FOWLER—KENNEDY.—On Sept. 10, in Birmingham, Frank Fowler, O.B.E., M.B., to Josephine Kennedy.

THOMSON—CULLING.—On Sept. 12, at Bushey, Herts, Wy Thomson, M.D., to Mary Winifred Culling.

DEATHS

BICKERTON.—On Sept. 13, in London, Reginald Ernest Bick D.S.O., M.B. Manc., colonel, R.A.M.C.(T.).

ELWORTHY.—On Sept. 11, in London, Reginald Robert Elw O.B.E., M.D., aged 66.

JENKINS.—On Sept. 15, Charles Evans Jenkins, M.R.C.S.

KINLOCH.—On Sept. 14, at Shoreham-by-Sea, William An Kinloch, M.B. Aberd., aged 76.

MANNINGTON.—On Sept. 12, at Hastings, Frank Mannin F.R.C.S., aged 75.

SMITH.—On Sept. 16, Harry Smith, M.R.C.S., D.P.H.

Notes and News

RELIEF OF NAUSEA IN PREGNANCY

SEA occurs in about 50% of pregnancies, and in about vomiting ensues. A preliminary report [1] suggests that nt remedy for these symptoms has been found in mamine' (β-dimethylaminoethyl benzohydril ether otheophyllinate), which has already yielded promising , in the treatment of seasickness.[2] Of 43 pregnant i who had had nausea and vomiting for 4–6 weeks, .) were completely relieved three hours after dramamine lministered; in the remaining 12 (28%) the drug had ct. In 10 of the cases successfully treated, the replace- of dramamine by a placebo was followed by relapse. e symptoms were promptly dispelled when dramamine ain administered. Each patient received 100 mg. times daily; but in 7 cases the dose was reduced to . three times daily because of minor side effects— ss and vague subjective muscle tremors.

HYDROTHERAPY ASSISTANTS

Chartered Society of Physiotherapy intends to assume sibility for training and registering those who carry out, st in carrying out, certain hydrotherapeutic treatments. andidates beginning at the age of 16 the training will bly last two years, while for those beginning at a later will probably last one year. A supplementary register assistants is to be opened: part 1, to be established ar, will include those who have already completed five satisfactory experience. In addition a provisional list opened, and will contain the names of those who have ted two years' satisfactory experience; they may for transfer to the supplementary register on completing ars' experience. Hydrotherapy assistants admitted to pplementary register (part 1) or to the provisional list permitted to carry out spray massage, douche massage, ny form of massage, movement, and manipulations water; but they may work only under the supervision hartered physiotherapist or a doctor. Part 2 of the mentary register, to be opened in October, 1951, will n the names of those who have completed the prescribed of training and have passed the society's examinations.

CHILDREN'S FEET

many years school medical officers have been raged to examine children's feet; for deformities ed early can be successfully treated, and chronic infec- an be cleared up before they become resistant. Many doctors take this task seriously, and require the en to come to the examination with their stockings off; seems that in many cases children continue to wear ngs during inspection. The Foot Health Education u has lately published a pamphlet [3] prepared by a al committee, which sets out clearly some suggestions may help school doctors to spot early the deformities an orthopædic surgeon can readily correct.

seems that at present quite unimportant degrees of sed flat-foot are the only conditions commonly referred; here is evidence that many of the foot abnormalities give trouble during (but seldom before) middle-age in childhood. In one group of children studied the rtion of those with hallux valgus rose from 5% in the r-olds to 52% in the 11–15 age-group. Socks and are the deforming agents of the growing foot, but it is ntil a child reaches the age of 8–10 that the distortion e great toe and its metatarsal can be recognised. At stage it can readily be corrected in an orthopædic depart- —but only if it is referred there. Other deformities are mportant, and most of them can be corrected only by tion. Claw and hammer toes are best tackled between ges of 10 and 16. An overlapping 5th toe needs earlier ction.

e pamphlet carries advice on the measuring of shoes, t of stockings, and the significance of postural defects; roughly practical addition is a sample of a foot-inspection record-sheet, copies of which can be ordered in bulk from the bureau. As the writers say, we have much to learn about the treatment of foot troubles; but we shall never learn until sufficient cases have been under observation. The pamphlet is to be discussed at a conference at Caxton Hall, London, on Friday, Sept. 30.

COLOURING THE OUTLOOK

THERE is something about the gluttonous way beginners at painting appropriate colour which is very heartening: it can be enjoyed to the full in the second Exhibition of Children's Art, arranged by the *Sunday Dispatch*, now on view at the Royal Institute Galleries, Piccadilly.

Patients from the mental treatment centre of Hill End Hospital are also holding their second annual exhibition, which may be seen until Oct. 1 at Foyle's Art Gallery, Charing Cross Road. Their work, however, is not as staggering as that of the children—nor indeed as that of their forerunners of last year. These pictures are less wildly personal, more consciously composed. The catalogue notes that most of them are by new patients: which seems to suggest either that the new exhibitors have better coördination of hand and eye or less emotional disturbance, than their predecessors; or else that Mr. N. C. Colquhoun, in charge of the painting class, has unconsciously allowed his zeal as a teacher to master his scientific detachment. Nevertheless, for some of the exhibitors mood was overwhelming. Two pictures—"A Day" and "A Week"—painted in columns bearing symbols of the patient's experiences, almost hour by hour, are heavily weighted with anxiety and depression. In a terrifying fantasy of "Flight through Space," by another patient, a vast yellow rocket shoots between planets. Many patients have painted nostalgic scenes of peace and safety (among these, the lighthouse with its swirling green seas is outstanding); and some have painted desolation. The most remarkable picture, judged as a painting, is "Autumn Tapestry," where a patchwork jumble of colours—rocks, clouds, great leaves, and wooden beams—resolves itself into a boat passing through a canal lock in a wooded country.

From the point of view of the clinician visiting this exhibition it would be a help to know, where several pictures are submitted, in what order they were painted.

University of Sheffield

The address at the opening of the new session of the medical school will be delivered in the Firth Hall on Friday, Oct. 21, at 5 P.M., by Mr. E. F. Finch, who is to speak on the Evolution of Medical Education.

University of Birmingham

The opening ceremony of the new session of the medical school will take place in the nurses' recreation hall, Nuffield House, Queen Elizabeth Hospital, on Tuesday, Oct. 4, at 3 P.M., when the Archbishop of Canterbury will deliver an address.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty on Sept. 5, with Dr. W. R. Snodgrass, the president, in the chair, the following were admitted to the fellowship:

Qua Physician.—John Barclay Barr, Allan John MacKenzie Campbell, Robert Fife, William Morton Fyfe, Somesh Chandra Ghosh, James Tudhope Hutchison, Arthur Colville Kennedy, Andrew Wilson Lees, Roderick Frank Maggs, Andrew Greig Melrose, Germano Antonio Vieira Ribeiro, Irene Parker Rowlands, Ram Sevak Singh, Thomas James Thomson, George Frederick Walker.

Qua Surgeon.—Abd El Hamid Bayoumi, Alastair Kingsley Brown, Henry McCraig Carson, Gordon Alexander Clark, Hugh Bush Crum, Frederick George Day, John Stewart Farrell Hutchison, John Lockie, Ian Reay McCaul, John Reid MacIntyre, Alexander Mellick, Pierre Stuart Olivier, Frank Riggall, Pyare Lal Rishi, Dudley James Toomey, William Francis Toomey, Harold Bernard Watson.

Rheumatism Exhibition and Conference

An exhibition organised by the British Rheumatic Association is to be opened at Chenil Galleries, King's Road, London, S.W.3, on Tuesday, Sept. 27, and will remain open until Friday, Sept. 30. The purpose is to illustrate the activities, aids, and appliances related to the treatment, aftercare, and training and employment of rheumatic patients. A two-day conference, to be held in Chelsea Town Hall, will begin on Wednesday, Sept. 28, at 2.30 P.M., with an address by Dr. W. S. C. Copeman on Modern Views on the Treatment of Rheumatoid Arthritis: at 5 P.M. Dr. W. S. Tegner will speak on the Care of the Rural Patient.

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rliner, P. E., Radman, H. M., Gay, L. N. *Science*, 1949, 10, 215.

y, L. N., Carliner, P. E. *Ibid*, 109, 359; *Bull. Johns Hopk. Hosp.* 1949, 84, 470; see *Lancet*, 1949, i, 462; leading rticle, *Ibid*, p. 827.

ot Inspection in Childhood and Adolescence. Obtainable rom the bureau, 121, Ebury Street, London, S.W.1. Pp. 8. 1s.

Charing Cross Hospital Medical School

The inaugural address of the new session will be delivered by Sir Norman Birkett at the hospital on Thursday, Oct. 6, at 4 P.M.

Board of Control

Miss Isabel Wilson, F.R.C.P., now a commissioner of the Board of Control, has been appointed a senior commissioner and member of the board, in succession to Miss Ruth Darwin.

Central Council for Health Education

Dr. L. J. H. Burton has been appointed deputy, and Dr. Anne F. Burgess assistant, to Dr. Robert Sutherland, medical adviser and secretary of the council.

Blood Donors

In England and Wales during the second quarter of this year gifts of blood to the National Blood Transfusion Service totalled 110,993—12,938 more than in the same quarter last year. New donors in the quarter numbered 36,847—the biggest response since the war—bringing the total strength of donor panels to 382,382. Hospitals are now using over forty times as much blood as before the war; and the demand is still rising. To provide for these future needs, over 190,000 more donors are wanted.

Travelling Expenses of Hospital Visitors

The Minister of Health has ruled that, under section 28 of the National Health Service Act, local health authorities may provide travel warrants for the near relations of patients in a hospital at a considerable distance from home, provided that: (1) the cost cannot be met by the relatives without substantial hardship; and (2) there is urgent reason for the visit because of the patient's serious condition, or the visit would in medical opinion benefit the patient and aid response to treatment. Apart from this arrangement, people visiting long-stay patients in certain institutions, such as sanatoria and mental hospitals, can make the return journey by train on payment of single fare if they obtain in advance an authorised voucher from the hospital.

Pavlov Centenary

A series of lectures to mark the hundredth anniversary of the birth of Ivan Pavlov has been arranged by the Society for Cultural Relations with the U.S.S.R. On Thursday, Oct. 6, Dr. A. S. McPherson is to review Recent Advances in the Study of Conditioned Reflexes; and on Thursday, Oct. 13, Dr. B. H. Kirman will consider the Applications of Conditioned Reflexes to Psychiatry. Both these lectures will be delivered at 14, Kensington Square, London, W.8. On Thursday, Nov. 3, at the University of London Institute of Education, Malet Street, W.C.1, Mr. J. G. Crowther will speak on Pavlov, Scientist and Man: his Place in the History of Civilisation. Each of these three lectures is to be given at 7.30 P.M.

Access to Patients' Records

Patients' hospital records are to be supplied, on request, to the medical boards and medical appeal tribunals of the Ministry of National Insurance, provided that this Ministry first obtains the patient's written consent. Announcing this, the Ministry of Health states that the purpose is to assist in the assessment of claims for disablement benefit under the National Insurance (Industrial Injuries) Act, 1946. Requests will reach hospitals from the regional medical officers of the Ministry of National Insurance. "The cases concerned will ordinarily be those in which the claimant to disablement benefit has received hospital treatment for his industrial injury or disease, although exceptionally case papers relating to treatment not connected with industrial injury may be asked for." The case papers, which will be treated as confidential, will be handled only by the regional medical officers (and their confidential lay staff), boarding doctors, and specialists to whom claimants may be referred, and in the case of appeals the members of the appeal tribunal. The regional medical officer may find it necessary to make extracts of the relevant portions of the case papers which have been taken into account by the medical boards. "The patient will not be put in possession of any information other than the extracts mentioned above which are directly relevant to his claim, and if these extracts contain any information which might be harmful to the claimant the regional medical officer will take care to give it only to the claimant's own doctor or, as appropriate, to his trade union or legal representative."

Kettle Trust Lecture

At the Royal College of Surgeons, Lincoln's Inn F London, W.C.2, on Friday, Oct. 7, at 5 P.M., Dr. Bea Pullinger will lecture on the Significance of Funct Differentiation in Mammary Tumours.

Chartered Society of Physiotherapy

"There is a limit to what a country can afford to even for health." This warning was given by Sir W Jameson, chief medical officer of the Ministry of He the dinner in London last Saturday of the Chartered of Physiotherapy. The health service, he said, could succeed without coöperation by those who worked those who used it; and constructive criticism was we Sir Wilson, who was replying for The Guests to a proposed by Lord Horder, the president, said that therapy had come into its own during the past ten or years; and this progress ran parallel with advances in rehabilitation. Every branch of medicine and now taking advantage of the physiotherapist's skill; among the patients who benefited were the victims of poliomyelitis, and the old and infirm. One a including physiotherapy in the hospital service had be achieve economy, for physiotherapists were too few. C dates were not lacking; but there was a dearth of pre and of teachers, Proposing The Society, Sir Harry P agreed on the need for more able young women to bec teachers. The society was founded 55 years ago, in 18 "an age of great vigour, of liberal outlook, of independe It had always had the support of doctors; and he wish well on behalf of orthopædic surgeons—"there's a vast course of them now, you know." In reply, Dr. W. S Copeman, chairman of the council, pointed out that society now had 17,333 members, compared with 4 in 1 In North America, where physiotherapy was less hig developed, the stock of British physiotherapy st high.

CORRIGENDUM: *Effect of Noradrenaline on the Human Ci lation.*—In this article by Dr. H. J. C. Swan (Sept. 17, p. 5 the caption of fig. 2 should have begun with words: "Blood-pressure and pulse-rate of hypersensit person. . . ."

Appointments

ABRAHAMS, A. M., M.B. Lpool, F.R.C.S.: visiting junior surg Victoria Central Hospital, Wallasey, and St. Catheri Hospital, Birkenhead.

BICKERTON, J. G., M.B. Edin., M.CH. (ORTH.) Lpool, F.R.C.S.E.: ju orthopædic surgeon to hospitals in Chester and Central Wi areas.

CHILDS, J. P., M.A., M.CH. Oxfd, F.R.C.S.: surgeon, South De and East Cornwall Hospital, Plymouth.

COOK, W. H. R., M.B. Lpool, M.R.C.P.: visiting assistant physici Broadgreen Hospital and Southport group of hospitals.

COUPER, E. C. R., M.D. Glasg., F.R.F.P.S. Glasg., D.P.H.: pæ trician, Southport and Ormskirk hospitals.

COX, L. W., M.B. N.Z., F.R.C.S., M.R.C.O.G.: visiting obstetrician gynæcologist, Walton Hospital, Liverpool.

CRAIG, W. J., M.B. Dubl., D.M.R.E.: part-time radiologist, Hert County Hospital.

FENTON, ELIZABETH, M.B. Lpool, D.A.: anæsthetist, Liver regional chest surgical unit.

FREEMAN, D. M. I., M.D. Lpool, M.R.C.P.: visiting assist physician, Warrington group of hospitals.

GASKELL, K. H., M.A., B.CHIR. Camb., M.R.C.S., D.M.R.: whole t class I consultant in diagnostic radiology, Bristol uni hospitals.

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CANCER OF THE LUNG *

REVIEW OF A THOUSAND CASES

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HE information presented here is based on personal erience gained in the North of England, where since 3 a regional scheme for thoracic surgery has been t up. A smaller amount of material from another tre in the Midlands, with which I have been associated e 1940, has also been drawn on.

ronchial carcinoma is probably now one of the most imonly recognised forms of cancer. Between four five thousand people die from it each year in England Wales. The mortality-rates per million (standardised) ing the first decade of this century were 10·2 for males 7·0 for females, and the corresponding figures for were 100·9 and 23·2. It is impossible to determine ther this increase is real or apparent. During recent s much has been made of the increased proportion hese cases in the necropsy series of large university pitals, but such figures may not necessarily be real es; they may merely mean that interest in cancer he lung having been stimulated by improved facilities diagnosis and treatment, a greater proportion of h patients now die in hospitals with active pathological artments rather than in their own homes or in erculosis sanatoria, where, at any rate in this country, h facilities are usually non-existent or very poor. merly many such patients, especially if they had ting, cough, purulent sputum, and abnormal physical s in the chest, probably languished in sanatoria as s of pulmonary tuberculosis without tubercle bacilli he sputum.

ancer of the lung entails a very large amount of work thoracic surgical clinics. Since the Northern Regional st Surgery Centre was established 15 years ago, we e dealt with more than 1000 cases; in the year up August, 1948, we had about 200 new cases, representing ut a quarter of our non-tuberculosis work. Thus any one time about 30 of the 160 beds in our wards occupied by these patients. Notwithstanding this, cancer registration figures for the area, the population which is almost 3,000,000, suggest that we see only out 60–70% of the actual number of cases.

BLE I—DISTRIBUTION OF BRONCHIOGENIC CARCINOMA BY AGE AND SEX

-group (yr.)	Females	Males	Total
16/30	2 (*2·0%*)	20 (*2·2%*)	22 (*2·2%*)
30/40	18 (*18·4%*)	78 (*8·7%*)	96 (*9·6%*)
40/50	33 (*33·7%*)	276 (*30·6%*)	309 (*30·9%*)
50/60	25 (*25·5%*)	351 (*38·9%*)	376 (*37·6%*)
60/70	19 (*19·4%*)	167 (*18·5%*)	186 (*18·6%*)
70	1 (*1·0%*)	10 (*1·1%*)	11 (*1·1%*)
Total ..	98	902	1000

INCIDENCE BY AGE AND SEX

Though essentially a disease of middle age, cancer the lung may develop in the very old and in children; have seen two or three children, aged about 10 years, ith inoperable growths. Cancer of the lung occurs most mmonly between 45 and 55 years in men and at a ightly younger age in women. Men made up just over 0% of our series (table I), and a similar sex-incidence as characterised most published series.

ÆTIOLOGY

A great variety of occupations is represented in any large series. We have not been able to confirm an early impression that gas and mining workers were among those most often affected, if only because the great bulk of our population consists of workers in the coal and allied industries and because cases are by no means uncommon among agricultural and other rural workers. Perry (1947) of the London Hospital, has found that industrial exposure to arsenic and certain other metallic substances may probably be associated with the ætiology of lung cancer; but such industries are not, so far as I know, represented in our area. Perry has also remarked that arsenic is present in carcinogenetically significant quantities in cigarettes; but this is difficult to reconcile with the disproportionate sex-incidence despite the vast increase of smoking among women, especially since married women appear to be more commonly affected than their single sisters.

There has been no evidence that those exposed to war gases in the 1914–18 war have been unduly liable to cancer of the lung.

The late Prof. Bernard Shaw, of my own university, during the great epidemics after the 1914–18 war, observing considerable displacement of islets of bronchial epithelium in those dying of influenza, suggested that there might be a greater incidence of bronchial carcinoma after fifteen or twenty years.

TABLE II—HISTOLOGICAL TYPES OF BRONCHIOGENIC CARCINOMA

Histological type	Females	Males	Total
Undifferentiated carcinoma	40 (*40·8%*)	321 (*35·6%*)	361 (*36·1%*)
Epidermoid carcinoma	11 (*11·2%*)	341 (*37·8%*)	352 (*35·2%*)
Adenocarcinoma	13 (*13·2%*)	60 (*6·7%*)	73 (*7·3%*)
Unverified ..	34 (*34·7%*)	180 (*19·9%*)	214 (*21·4%*)
Total ..	98	902	1000

ANATOMICAL DISTRIBUTION

The right lung was more commonly affected (52·3%) than the left, but Björk (1947), analysing a smaller number, considered that a similar difference was not statistically significant. The whole left lung is much more often involved than the whole right lung, and an upper more often than a lower lobe. In many cases the lesion is in a small bronchus inaccessible to endoscopy. More rarely the condition formerly known as "diffuse pleural endothelioma" is met; this is characterised by a diffuse thickening of both pleural layers, by effusion, and eventually by matting and invasion of the mediastinum and its viscera. It is now regarded as a low-grade poorly differentiated bronchiogenic carcinoma.

PATHOLOGY

It is generally recognised that there are three histological types of cancer arising from the bronchial epithelium: the undifferentiated or oat-cell type, the epidermoid carcinoma, and the adenocarcinoma, in that order of frequency. The undifferentiated type is much more common in females (table II).

Like Björk (1947) we have found no special relationship either between age and differentiation or between site and histology. The epidermoid growth seems especially liable to be associated with cavitation and gross abscess formation as distinct from a diffuse necrotic process or secondary bronchiectasis, which may occur with any type. Unlike Björk, we find that the prognosis is very much worse in the undifferentiated group.

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* An address given before the Oslo Kirurgiske Forening on Aug. 23, 1948.

As the initial tumour increases it tends to ulcerate, and the discharge appears as " sputum," or it may bleed, causing hæmoptysis. If the bronchus gets blocked incompletely and infection supervenes, purulent sputum is coughed up ; if the obstruction is complete, the segment of lung collapses, with distortion of the thoracic contents, pain, &c. It is important, from the point of view of differential diagnosis, to realise that, just as in bowel cancers, this obstruction may sometimes be intermittent, presumably as the infective element varies, especially with modern treatment. If septic changes predominate, extensive destruction and abscess formation or even gangrene may develop distal to the obstruction. Extension of this process may cause an effusion or even an empyema. Projections of the growth may obtrude into the opposite bronchus and cause severe dyspnœa. Spread is partly by direct extension into the neighbouring structures but also, in most cases, by the lymphatics and blood-stream.

DIAGNOSIS

Unfortunately cancer of the lung is often clinically silent in its earlier stages. Attention is usually drawn to it, unless it is discovered accidentally by radiography, or by some complication. In our series cough was the commonest first symptom, and after that pain, dyspnœa, lassitude, hæmoptysis, wasting, fever, clubbing, &c. :

Initial symptom	*Cases*		*Initial symptom*	*Cases*	
Cough	266	*(31%)*	Hoarseness ..	8	*(1·0%)*
Pain	205	*(24%)*	Sputum	8	*(1·0%)*
Dyspnœa.. ..	96	*(11%)*	Clubbing	6	*(0·7%)*
Lassitude.. ..	82	*(9·5%)*	Dysphagia ..	5	*(0·6%)*
Hæmoptysis ..	58	*(6·7%)*	Sundry other symptoms	59	*(7·0%)*
Loss of weight ..	27	*(3·1%)*			
Fever	15	*(1·7%)*			
Wheezing ..	15	*(1·7%)*	Total ..	861	
Congestive failure	11	*(1·0%)*			

Hæmoptysis, which occurs at some stage in most cases, is not necessarily an early symptom—it was the first symptom in less than 7% of our cases. Unfortunately both cough and pain are common symptoms which are apt to be treated lightly, even when medical advice is sought. It should therefore be emphasised that a cough occurring in an adult, especially if persistent and incapable of some simple explanation, calls for a most careful investigation by the methods now available. Even so, cases can still be missed, and I can think of at least two in which, after a careful investigation, we did not detect the growths from which the patients ultimately died.

Björk (1947) found, with 112 inoperable cases referred in one year to the Brompton and Cancer Hospitals, that there was an average delay of 8·4 months between the first symptoms and reference to hospital ; and that, whereas the patient was responsible for 3·4 months of this delay, the doctor was to blame for 5 wasted months. Our experience has been similar. Few such patients now linger for long periods in sanatoria ; but regrettably, too many probably still linger in the medical wards of general hospitals until all chance of resection has been lost. The average duration of symptoms in our series was as follows :

Histological type	*1941–43 (215 cases)*	*1944–45 (244 cases)*	*1946–47 (346 cases)*
Undifferentiated carcinoma	7·0 mos. ..	6·9 mos. ..	6·9 mos.
Epidermoid carcinoma ..	10·1 ,, ..	8·5 ,, ..	7·7 ,,
Adenocarcinoma ..	8·2 ,, ..	10 0 ,, ..	6·6 ,,
Unverified	7·0 ,, ..	10·0 ,, ..	6 4 ,,

Though our propaganda has certainly brought us more cases it has not led to any improvement in our material. Though the number of our cases has risen each year from a mere handful fifteen years ago to a steady 175–200 for the last two or three years, the operability-rate has not improved—indeed it has fallen. We now seem to be involved in what at first sight appears to be wasted effort entailed in the investigation of so many hopeless cases..

It was hoped that mass radiography would some improvement, but in our experience this has most disappointing. No appreciable proportion operable patients have come in this way, those patients are excluded who went to such ca because they already had chest symptoms. There is the centre which hangs on to "suspicious" case observation instead of referring them at once for gation. I have known instances where patients been held up for very long periods in this way, having actually become inoperable as a result. T mind much better dividends would have been paid system, whereby every patient entering a hospital whatever purpose, had an X-ray examination of chest.

Differential Diagnosis.—The conditions which bron genic cancer may simulate are legion. I have seen cases in which, after an abdominal operation, a su onset of fever, pain in the chest and shoulder, and a initial hæmoptysis led to bronchial cancer being reg as pulmonary infarction. " Delayed resolution " " unresolved pneumonia " should always be regarde due to carcinoma until proved otherwise. Similarly cases of chronic abscess should be fully investig Pleural effusions and empyemas are usually expressio some underlying pulmonary disease ; in the ca pleural effusions this is often, and in the case of [illegible] occasionally, a carcinoma which may still be Bronchiectasis developing " out of the blue," in later life, and rapidly developing clubbing the fingers (pseudohypertrophic pulmonary arthropathy) should also be suspect.

Radiology.—Dr. Whately Davidson has summa the radiological appearances in our cases as follows. 64% the picture was one of collapse, either of an e lung (24%) or of a lobe (40%). A dense shadow present in the hilus in about 17% ; and in about a cavity with a fluid mimicking a chronic lung ab was seen. A solitary mass was noted in the centre the periphery of the lung in 4%. The remaining c presented as lesions resembling those of apical fi cavernous tuberculosis, and a few as massive effusi We have had only one or two cases of so-called Panc tumour, and one of these was not a lung tumour a but a malignant neurogenic tumour. A few cases, later developed a mass between the scapula and spine, have presented radiologically as absorption the back ends of the third and fourth ribs. The appearances of a tumour must depend on its site, and rate of growth. The direction in which it whether endobronchial or extrabronchial, will dete the shape and size of the opaque area. The developm of complications may *cause a complete* change in whole picture. Early signs are often missed, even radiologists, and the *importance of routine* lateral fi cannot be too strongly urged. Obstructive emphyse may be an early sign, but it seems likely that depende on routine single-plane films without fluoroscopy m be responsible for failure to recognise this change. suspected it may, and should, be confirmed by tak radiograms both in different planes and in differ phases of respiration. A common first appearance is increase in the size and density of a root shadow. E this may pass unobserved. When suspicion is rais careful tomography may disclose a mass protrud into the bronchial lumen or causing moderate compr sion. In only a small proportion of the " collaps cases will efficient tomography not show either a defin mass or at least a very suspect area of greater dens at the apex of the pyramid of collapsed lung tiss Tomography is especially valuable where the growth in a bronchus inaccessible to bronchoscopy, and *distinguishing between an abscess and* the cavity of lasm which is breaking down. The characteristic arances of the latter are indeed best seen in tomo-s: the outer contour may be smooth, round, or and with slight lobulation, unless the growth has dy become more generally invasive: its wall, ng a rind-like appearance, is usually very thick; its internal contour presents nodules of smooth or ular outline, which protrude into the lumen. There ll some scope for the use of iodised oil. Bronchial sion thus demonstrated may be shown by an abrupt verse shadow or as a finely tapering off "rat's tail."

onchoscopy—and of course the taking of a biopsy imen, if possible—is an essential routine investigation. ugh many growths are in bronchi inaccessible to such ection, mediastinal glandular involvement may often ecognised and assessed by the appearances of the carina. It is important to remember that a broncho-y which is negative at the outset of a long period of rvation may give positive findings when repeated .

ploration.—Often an exploration is made to confirm diagnosis; this usually means a pneumonectomy—ss the condition is found to be too far advanced—use if there is an X-ray shadow there is usually a able lump, and generally speaking the only safe g to do with a palpable lump is to remove it. On e half-dozen occasions this policy has led to our oving lungs for non-malignant conditions, including d pneumonia, calcified hæmatoma, tuberculoma, thoma, and a chronic abscess containing a tooth.

TREATMENT

e recommend exploratory thoracotomy in all cases out obvious contra-indications such as clinical or ological evidence of dissemination, bad general ition of the patient, extension of the growth too e to the carina or into the mediastinal viscera, and s widening or distortion of the carina. We have now nt that advanced age, poor cardiorespiratory reserve, hysema, and arteriosclerosis, especially coronary fficiency, are also contra-indications.

hough we have never yet found an operable lesion he presence of recurrent palsy, diaphragmatic palsy s not necessarily indicate malignant invasion of the enic nerve, which may merely be involved in an ciated inflammation. Empyema is certainly not a tra-indication. Our policy of investigating every case empyema completely, including bronchoscopy and nchography, before completion of convalescence has ught us not only a harvest of previously unrecognised nchiectatics but also an occasional operable growth. ilarly, the fact that an effusion is bloodstained does essentially imply that the underlying growth is perable. I can recall such a patient who survived umonectomy and worked as an outside manager of a yard, dying from some obscure wasting condition, sibly metastases, three years later. Cases in which parietal pleura has been invaded also may do e well, provided the overlying chest wall or dia-agm, as the case may be, is removed with the growth; the other hand, removal of a growth with the overlying , when they are invaded, is nearly always followed by urrence within a few months. It may be necessary remove the pericardium to complete a satisfactory noval and even to encroach on to the heart; indeed, a dier in whom it was necessary to make a major roachment into the auricle to obtain good clearance d, after two years' heavy manual work, from a leaking eurysm of the auricle. We habitually make a barium amination of the œsophagus in doubtful cases before eration, because we have never found the case operable ere the œsophagus has been found to be distorted.

OPERATIVE MANAGEMENT

Preoperative preparation includes thorough training in respiratory exercise and postural drainage. The patient is made familiar with the wearing of a B.L.B.-type oxygen mask. Oral sepsis is corrected as far as possible. Anæmia is treated with iron and, if need be, by transfusion. Intrabronchial and systemic administration of penicillin, &c., is necessary in "wet" cases.

As in all chest surgical cases, the anæsthetist participates fully in the preoperative investigations and consultations, to ensure intelligent management of the case during operation, and as fully in the subsequent care of the patient. The anæsthetist is also responsible for the maintenance of a clear airway, efficient respiration, and adequate oxygenation; this entails, inter alia, control of tracheobronchial secretions. It is the anæsthetist's responsibility to combat shock and to supervise operative and postoperative resuscitation and the replacement of blood, &c., by transfusion.

The bronchus of the lung to be removed is occluded with a Thompson cuff introduced under local anæsthesia, as is the Magill intratracheal tube for the subsequent administration of the anæsthetic. The anæsthetic agents used are thiopentone and cyclopropane; but, if diathermy is used throughout the operation, thiopentone, curare, and nitrous oxide and oxygen are given. The further administration of thiopentone and curare, a method increasingly relied on, is with a small Gordh-type needle usually fixed into one of the small veins on the back of the hand. Controlled respiration of the type introduced by Geudel in America and by Nosworthy in England is now always used by our anæsthetist, Dr. Joan Millar. The spiropulsator of Crafoord is not usually available in this country, but I am impressed by its value, especially in long operations.

Some surgeons prefer to operate on such patients in the face-down position, but we always use the standard lateral thoracotomy position, and control bronchial secretions by intratracheal suction and, when possible, by means of the Thompson cuff tampon. We are convinced that the use of this cuff alone has enabled us to operate on many patients who would otherwise have been too "wet" to deal with.

Access to the chest is usually through the bed of the fifth or sixth rib. If the lung is densely adherent to the parietes, it is preferable to mobilise it by an extensive extrapleural strip: this is often accompanied by severe bleeding, but we proceed with this as rapidly as possible, controlling the bleeding with hot packs and transfusion, to avoid delay in reaching the hilus. Here our practice differs from that in Scandinavia, and perhaps we are

TABLE III—RESULTS OF PNEUMONECTOMY IN BRONCHIOGENIC CARCINOMA

Group	Cases	Explorations	Pneumo-nectomies	Operative deaths within a month		Later deaths in pneumo-nectomies	
				Explora-tions	Pneumo-nec-tomies	Exten-sion of growth	Other causes
Nottingham series	43	40	23	3	4	6	2
N.R.C.S.C. series							
1933–40	84	24	6	10	3	2	1
1941–43	215	69	33	5	13	10	6
1944–45	244	86	57*	5	11	33	4
1946–47	346	115	69	9	21	17	4
Jan.–April, 1948 ..	68	19	14	0	2	0	1
Total ..	1000	353	202	32	54	68	18

* Two lobectomies, in addition, were done in 1944: one patient died after operation, and the other died two years later with secondaries.

As the initial tumour increases it tends to ulcerate, and the discharge appears as "sputum," or it may bleed, causing hæmoptysis. If the bronchus gets blocked incompletely and infection supervenes, purulent sputum is coughed up; if the obstruction is complete, the segment of lung collapses, with distortion of the thoracic contents, pain, &c. It is important, from the point of view of differential diagnosis, to realise that, just as in bowel cancers, this obstruction may sometimes be intermittent, presumably as the infective element varies, especially with modern treatment. If septic changes predominate, extensive destruction and abscess formation or even gangrene may develop distal to the obstruction. Extension of this process may cause an effusion or even an empyema. Projections of the growth may obtrude into the opposite bronchus and cause severe dyspnœa. Spread is partly by direct extension into the neighbouring structures but also, in most cases, by the lymphatics and blood-stream.

DIAGNOSIS

Unfortunately cancer of the lung is often clinically silent in its earlier stages. Attention is usually drawn to it, unless it is discovered accidentally by radiography, or by some complication. In our series cough was the commonest first symptom, and after that pain, dyspnœa, lassitude, hæmoptysis, wasting, fever, clubbing, &c.:

Initial symptom	*Cases*		*Initial symptom*	*Cases*	
Cough	266	(*31%*)	Hoarseness ..	8	(*1·0%*)
Pain	205	(*24%*)	Sputum	8	(*1·0%*)
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Wheezing ..	15	(*1·7%*)	Total ..	861	
Congestive failure	11	(*1·0%*)			

Hæmoptysis, which occurs at some stage in most cases, is not necessarily an early symptom—it was the first symptom in less than 7% of our cases. Unfortunately both cough and pain are common symptoms which are apt to be treated lightly, even when medical advice is sought. It should therefore be emphasised that a cough occurring in an adult, especially if persistent and incapable of some simple explanation, calls for a most careful investigation by the methods now available. Even so, cases can still be missed, and I can think of at least two in which, after a careful investigation, we did not detect the growths from which the patients ultimately died.

Björk (1947) found, with 112 inoperable cases referred in one year to the Brompton and Cancer Hospitals, that there was an average delay of 8·4 months between the first symptoms and reference to hospital; and that, whereas the patient was responsible for 3·4 months of this delay, the doctor was to blame for 5 wasted months. Our experience has been similar. Few such patients now linger for long periods in sanatoria; but regrettably, too many probably still linger in the medical wards of general hospitals until all chance of resection has been lost. The average duration of symptoms in our series was as follows:

Histological type	*1941–43* (*215 cases*)	*1944–45* (*244 cases*)	*1946–47* (*346 cases*)
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Differential Diagnosis.—The conditions which genic cancer may simulate are legion. I have seen cases in which, after an abdominal operation, a onset of fever, pain in the chest and shoulder, and a initial hæmoptysis led to bronchial cancer being as pulmonary infarction. "Delayed resolution" "unresolved pneumonia" should always be regarde due to carcinoma until proved otherwise. cases of chronic abscess should be fully Pleural effusions and empyemas are usually some underlying pulmonary disease; in the pleural effusions this is often, and in the case of empy occasionally, a carcinoma which may still be oper Bronchiectasis developing "out of the blue," espec in later life, and rapidly developing clubbing the fingers (pseudohypertrophic pulmonary arthropathy) should also be suspect.

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PALLIATIVE TREATMENT

orphine and cocaine given in increasing doses with hol will often afford reasonable relief and make tence tolerable. More severe neuralgic pains may d to intervertebral injections of anæsthetics or may a require cordotomy, and I have also seen cases re division of the phrenic nerve has helped to relieve iously intractable painful dragging sensations. netimes the intense pain of bony secondary deposits require osteotomy and the curetting out of the plastic tissue.

ormerly the suffocative symptoms of mediastinal npression could be helped only by division of the er sternum; this may still at times be useful, but such nptoms can usually be relieved by X-ray therapy. such cases X-ray therapy should never be withheld, ause it sometimes affords dramatic relief, and also ause the growth may prove to be a radiosensitive nphocytoma rather than a carcinoma.

neumonectomy itself should not be overlooked as a liative operation, especially in cases of pseudohyperphic pulmonary osteo-arthropathy and where pulnary infection is causing distress. Once the problem istula and empyema after pneumonectomy is mastered, scope of the operation in this field may well be lened.

ariations in the natural course of cancer of the lung ke it difficult to assess the results of treatment. I ve known a case with a continuous history extending er about five years, but we know that most cases run very much shorter course, whatever the treatment. I n recall two patients in whom, though the growth s probably still removable, gross metastases scattered roughout the pleura were considered to preclude rther treatment; subsequently these patients did avy manual work for over a year before their strength clined and they ultimately died.

Until we can get these cases at a much earlier stage, ey will continue to be a disheartening part of our work. ven so, despite all the risks and the work involved, eumonectomy offers the best hope of long survival d should be considered whenever possible.

I am greatly indebted to my colleagues, Mr. S. G. Griffin d Mr. W. C. Barnsley, assistant surgeons in the Regional est Surgery Centre, and to Mr. W. Buckley, assistant oracic surgeon to Nottingham City Hospital, for all the ouble they have taken to obtain this information for me, ides the active part they have played in the management the cases. Mr. Barnsley has done a vast amount of work this connexion, and it is largely on this that I have drawn.

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"... in our wisdom we have adopted the custom—I might haps call it the curse—of our academic and purely scientific ethren, which now ordains that the young newcomer to dicine must establish himself on the basis of what he has ready written. In plain language, he must write if he wants job. This single fact is the causa causans of the chaos of dical literature today. . . . We have not the option of the ookstall, where to miss the worthwhile in a mass of futility es not necessarily matter. What has been written must be ad, for we cannot afford to be unaware of elements of rogress however inconspicuous they may be. . . . In England n alleged shortage of paper provided a faintly brighter rospect that has vanished with nearly every other post-war ope."—JULIAN TAYLOR, F.R.C.S., in the Hamilton Russell ecture, *Aust. N.Z. J. Surg.* August, 1949, p. 10.

TREATMENT OF STATUS EPILEPTICUS

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STATUS epilepticus, the occurrence of several grand-mal convulsions without recovery of consciousness between each, should be looked on as a grave emergency. If effective measures are not taken promptly to arrest the fits, the patient is likely to die.

The use of modern chemotherapy in the late war allowed the survival of many patients with severe brain wounds which would formerly have proved fatal. Hence there are more traumatic epileptics, and ipso facto cases of status epilepticus, in the community. The subject is inadequately dealt with in standard textbooks; and the occurrence of several probably avoidable deaths from this cause has prompted us to make this brief review of 25 cases, mostly of the symptomatic group, and to mention one régime which in our experience has proved a safe and usually effective remedy.

Status epilepticus can nearly always be cured if correct treatment is instituted early. Such treatment must not be allowed to obscure the medical or surgical measures required to deal with the underlying lesion in symptomatic epilepsy. However, even in these cases, arresting the fits is generally a life-saving measure and certainly an essential preliminary to further diagnosis and treatment, which may have to be delayed until special facilities are available.

MATERIAL

Our material was gathered from either the Radcliffe Infirmary or the head-injury bureau at Wheatley Military Hospital, and the records of 36 patients were examined, of whom 12 had died. Information was inadequate for detailed study in 11 cases; of the remaining 25 patients (tables I and II), 17 were seen personally by one or other of us, details of the remaining 8 being obtained from case-records. In 2 patients two separate attacks of status epilepticus occurred; 3 patients appeared to be idiopathic epileptics; and 22 had some organic brain lesion as the presumed cause of the convulsions. Necropsy was performed in all the fatal cases; in none of them was any definite cause found for their death apart from the fits. In those with brain wounds there had been early and adequate neurosurgical treatment, and cases with an infective process showed evidence that this had been controlled by medical treatment.

FINDINGS

If one compares the non-fatal cases (table I) with the fatal (table II), two points clearly emerge. In the fatal cases the interval between the onset of status epilepticus and the beginning of treatment was usually much longer than in the non-fatal cases, and the duration of status epilepticus was longer in the fatal cases than in the others. (The duration was taken to be the period in which convulsive movements continued without any recovery of responsiveness to questions or commands. In many cases it was subsequently found that a far longer period was occupied by a total amnesia. This was probably due partly to the drugs used in treatment, though in some cases it may have represented an extension of the epileptic process.)

The type of treatment, on the other hand, seems to vary widely in both groups, and at first sight it might seem that the particular treatment used was of little importance. The detailed course of individual cases, however, suggests that this is a false impression. There is evidence that paraldehyde is the drug of choice, both wrong, but we do not like to spend more than two, or at most three, hours on such an operation.

The present practice is to cut the bronchus across as close to the carina as possible and to close it with a series of fine interrupted linen-thread sutures. Alternate sutures of this series are used to anchor a flap of parietal pleura over the bronchial stump. Penicillin-sulphathiazole powder is placed in the mediastinal bed round the stump, and the same drugs are given systemically for 10–14 days afterwards. Whenever the pleural effusion is aspirated subsequently, penicillin 100,000 units in 5 ml. of fluid is left in the pleural cavity.

COMPLICATIONS AND MORTALITY

The mortality from these operations has been heavy (table III), but it must be remembered that, of necessity, many cases which are now regarded as unsuitable have been undertaken in the past; the material occurs in the age-groups liable to cardiovascular and other degenerative disasters; and, unfortunately, some deaths from unexpected mishaps have taken place in what might have been our best material, but I think that many valuable lessons have been learnt from our bitter experience. Our mortality is also weighted by borderline cases, the inoperability of which could not be certainly recognised until some irretrievable step had been taken. This will always remain so, to some extent, unless such patients are not given the only likely chance of recovery.

TABLE IV—INCIDENCE OF FISTULA AND EMPYEMA AS COMPLICATIONS OF PNEUMONECTOMY FOR CARCINOMA

Year	Cases	Fistulæ requiring drainage	Empyemas requiring drainage	Deaths from fistula and empyema	Deaths from other causes
1943	13	4	2	2	2
1944	28	12	..	5	4
1945	38	8	2	2	3
1946	44	5	..	1	8
1947	42	8	1	3	6
Part of 1948	19	..	1	1	2
Total ..	184	37	6	14	25

Bronchial fistula and empyema are the most serious complications of pneumonectomy (table IV). The frequency of empyema, in the absence of fistula, has diminished with modern methods, but we still have occasional tragic difficulties with unexpected and most refractory empyemas, usually due to penicillin-resistant organisms. It is not perhaps generally realised that an appreciable number of the late deaths after pneumonectomy, say as long as two years afterwards, may be due to delayed opening of a bronchial fistula. We always seem to be about to settle the fistula problem, and certainly technical improvements have been made and the position is very much better, but I doubt if the matter has been completely solved.

We have explored 353 out of the 1000 patients, and in these pneumonectomy was possible in 202. Of the patients who underwent pneumonectomy, 54 died a month, as did 32 of the 151 who were merely . Of those who underwent pneumonectomy and the first month, 68 died from metastases, &c., another 18 from other causes.

TABLE VI—PNEUMONECTOMY PATIENTS SURVIVING AT INTERVALS (INCLUDING PRESENT SURVIVORS)

Group	Cases	Pneumonectomies	Length of survival (yr.)							r
			1	2	3	4	5	6	7	
Nottingham series ..	43	23	11	2	2	..	..	..	..	11 (10 to 4
N.R.C.S.C. series										
1933–40 ..	84	6	1	1	..	..	..	..	.	None
1941–43 ..	215	33	10	8	6	4	2	2	1	4 (4¹/ yr.)
1944–45 ..	244	57	23	15	9	5	..	..	..	9 (3
1946–47 ..	346	69	23	4	..	..	..	..	..	27 (6 2½.
Jan.–April, 1948 ..	68	14	..	..	..	..	..	..	.	11
Total ..	1000	202	68	30	17	9	2	2	1	62 (to 7

RÖNTGEN THERAPY

Through the coöperation of Mr. C. J. L. X-ray treatment is given to the patients who operation or are unsuited for it, to those whose is found to be inoperable on exploration, to all undifferentiated growth whether operated on or not to cases in which growth is present in the glands at operation.

The radical course extends over five or six 4500 r being given for undifferentiated growths 5500 r for epidermoid growths. Four or five field used—lateral, anterior, and posterior. The contou the chest are assessed by a physicist to ascertain correct beam directions. Pyridoxine is found helpf controlling nausea and sickness. *Oral sepsis and an* are corrected as in the preparation for *pneumonect* and the erythrocyte level is maintained as fa possible during the course, being checked by repe blood-counts.

When little more than palliation is looked for, a co of 2500–3000 r is given in three weeks. In case mediastinal obstruction 500 r is given in one and supplemented as the patient's progress seem indicate.

Great symptomatic and radiological improvement follows a course of X-ray therapy, but unfortunatel the great majority of cases this is not maintained and patient dies within a few months (table V). We 42 patients alive out of 445 so treated for periods ran from 5 months to 5·5 years. This includes 2 out of (1·77%) alive for 5 years, and 6 out of 125 (4·8%) for 2–3 years. These figures must be compared with pneumonectomy figures (table VI); 62 out of 202 pati alive from 2 months to 7 years after pneumonecto

TABLE V—RESULTS OF IRRADIATION OF BRONCHIOGENIC CARCINOMA

Group	Cases	Treated	Untraced	Died during D.X.T.	Length of survival								Present survivors
					3 mos.	6 mos.	9 mos.	12 mos.	2 yr.	3 yr.	4 yr.	5 yr.	
1933–40	84	19 (2)*	3	7	7	3	2	2	1	0	0	0	None
1941–43	215	113 (24)	7	29	47	30	18	12	5	5	2	2	2 (5 yr. 5½ yr.)
1944–45	244	125 (20)	5	31	59	35	19	14	8	2	0	0	6 (4 for 2½ 2 for 3 yr
1946–47	346	188 (30)	2	32	110	62	30	30	6	..	..	..	34 (5 mos 2 yr. 4 mo
Total	889	445 (76)	17	99	223	130	69	58	20	7	2	2	42 (5 mos 5½ yr.)

* Cases explored before therapy are shown in parentheses.

TABLE II—DEATHS FROM STATUS EPILEPTICUS

ase no.	Age (yr.)	Sex	Type of lesion	Interval between start of status and start of treatment	Duration of status epilepticus	Treatment	Remarks
15 econd ack)	$^{11}/_{12}$	F	? Idiopathic epilepsy	>4 hr.	24 hr.	Paraldehyde 2 ml. I.M., phenobarbitone gr. $^{1}/_{4}$ by mouth	..
16	29	M	Left petrous inflammation	4 hr.	8 hr.	Phenobarbitone gr. 18, thiopentone 1 g. I.V., paraldehyde 1 oz. per rectum	Fits ceased some hours before death
17	56	M	Bifrontal brain wound 2 yr. before	>3 hr.	3 days	Paraldehyde 2 drachms by mouth, 'Evipan' 0·5 g. I.V., sod. phenobarbitone gr. 3 I.V., bromethol per rectum	Fits ceased 6 hr. before death
18	20	M	Left frontal brain wound 5 yr. before	..	>6 hr.	No treatment	Found comatose in bed, continuous fits in ambulance to hospital, moribund on arrival
19	23	M	Left frontal brain wound 18 mos. before	3 hr.	10 hr.	Sod. phenobarbitone gr. 6 I.M., thiopentone 1·5 g. I.V.	Fits ceased 5 hr. before death, serial epilepsy for 2 days before status epilepticus
20	24	M	Right frontal parietal brain wound 4 yr. before	2 hr.	8 hr.	Morphine gr. $^{1}/_{4}$, chloroform inhalation controlled fits for $^{1}/_{2}$ hr.	5-hr. ambulance journey without treatment, arrived moribund
21	29	M	Left frontal brain wound 3 weeks before	4 hr.	28 hr.	Sod. phenobarbitone gr. 4 I.M., thiopentone 0·5 g. I.V. 6 hourly × 2, paraldehyde 1 oz. per rectum	Fits ceased 10 hr. before death
22	5	F	Idiopathic epilepsy	10 hr.	15 hr.	Bromide gr. 5 by mouth, sod. phenobarbitone gr. 3 I.M.	Fits ceased 1 hr. after phenobarbitone; child died 3 hr. later; serial epilepsy for 24 hr. before status epilepticus, treated with bromides
23	$^{5}/_{12}$	F	Streptococcal meningitis	2 days	3 days	Sod. phenobarbitone gr. $^{1}/_{2}$ 8-hourly	Serial epilepsy for 2 days before, treated with syrup of chloral; sulphonamides for meningitis
24	$^{9}/_{12}$	M	Mastoiditis	>6 hr.	3 days	Paraldehyde 4 ml. I.M., phenobarbitone gr. 2 by mouth	Fits ceased 2 days before death
25	35	M	Right frontal brain wound $3^{1}/_{2}$ yr. before	8 hr.	3 days	Sod. phenobarbitone gr. 3 I.M. 4-hourly.	Fits ceased 12 hr. before death; serial epilepsy for 2–3 days before

checked the more probable is a fatal outcome. This emphasised by the following figures:

Duration of status epilepticus	*No. of deaths*	*No. of recoveries*
Under 3 hr.	0	6
3–12 hr.	4	8
12–24 hr.	1	2
Over 24 hr.	6	0
Total	11	16

In many cases where fits have been finally controlled ter some hours irreversible changes seem to have ken place and death ensues after a further period of ma. This was so in 5 of the 11 cases given in table II.

our experience paraldehyde is a safe and effective ug in this condition. The principle of treatment is to tablish as rapidly as possible an effective anticonvulnt blood-paraldehyde level and to maintain this until e fits stop.

The régime we consider advisable for an average adult as follows:

(1) As soon as possible 8–10 ml. of paraldehyde is injected to the gluteal muscle, and the site of injection is massaged. e paraldehyde need not be sterilised. This treatment ually stops the fits within half an hour.

(2) If the fits continue, 5 ml. of paraldehyde intramuscularly given every half-hour until they cease. The persistence of cal twitching without any tendency to spread does not quire further sedation, and attempts to eliminate these tirely may lead to a dangerous level of narcosis.

(3) If the patient's general condition indicates it, an travenous glucose-saline or plasma drip is given at the rate one bottle in three hours. This will also provide a conient method of continuing the administration of paralehyde, either by intermittent injections into the drip tubing, in solution in the drip fluid in any required concentration, nce it is soluble 1 in 8 in physiological saline solution.

In practice most cases will be controlled by the intrauscular injections and a drip will not be required. owever, if fits recur as the effect of the paraldehyde ears off, an intravenous drip gives a means of adjusting curately blood-paraldehyde level so that fits are ontrolled but coma is not too deep. This is important, nce drugs which control status, to be effective, must be used in doses which abolish consciousness. Moreover, if fits continue for long, intravenous fluids may be necessary to combat either obvious dehydration or the accumulation of metabolites in tissue fluids and blood. An intramuscular injection in patients whose circulatory state suggests that it will not be absorbed is clearly valueless, and in these cases a drip should be set up at once.

For children the dosage in the régime described above is smaller; but it is still higher than is generally realised, and even in infants aged only a few months 2 or 3 ml. of paraldehyde intramuscularly must be given to be effective.

The value in certain cases of an adequately maintained blood-paraldehyde level, which can best be achieved by continuous intravenous drip, is well illustrated in the following case, which in our experience was unusually severe:

Case 26.—A man, aged 27 (not included in table I) was admitted to hospital in status epilepticus with fits every

TABLE III—CASE OF STATUS EPILEPTICUS TREATED WITH INTRAVENOUS PARALDEHYDE SOLUTION

Hours since admission to hospital	Paraldehyde dosage	Method of dosage	Fit frequency (no. per hr.)
1–2	None	..	12
3–7	2 ml. hourly	Intermittently into drip tubing	12
8–11	4 $^{1}/_{2}$ ml. hourly		6
12–20	2 ml. hourly		4
21–24	2 $^{1}/_{2}$ ml. hourly		4
25–28	6 ml. hourly	In solution in drip fluid 18 ml. per bottle of 540 ml.	4
29–31	6 ml. hourly		1
32–35	6 ml. hourly		None
36–43	None		1 in last hour
44–48	6 ml. hourly		None (began to respond to stimuli)
49–54	3 ml. hourly		None (able to swallow)
55–64	None		8 in last 2 hr.
65–67	3 ml. direct I.V. 3 ml. hourly		None (able to talk)

In the next 24 hr. the drip was stopped and paraldehyde 2 drachms 4-hourly by mouth was given. This was changed gradually to phenobarbitone gr. 1 q.d.s.

from the rapidity of its effect in checking convulsions and from its success in abolishing fits in some cases where barbiturates had failed. These points are illustrated in the following brief case-records.

Case 2.—A boy, aged 18, had a gunshot wound of the right frontal pole of the brain. After neurosurgical débridement *this healed without incident. The patient returned to civilian* life and to light employment.

Some three years after his injury he suddenly had a series of grand-mal convulsions without recovery of consciousness between each. *Within three-quarters of an hour of their* onset he was taken to a local hospital, where he was given 5 ml. of paraldehyde intramuscularly. Within half an hour full convulsions ceased, and within three hours of the onset the patient could be roused to answer questions correctly, though he was still very drowsy.

He was transferred two days later to another hospital, where he again went into status epilepticus. On this occasion he was given gr. 5 of sodium phenobarbitone intramuscularly within twenty minutes of the onset. However, his fits continued for a further hour, when they tailed off gradually. He was then given gr. 1 of phenobarbitone by mouth t.d.s. and has reported no further fits.

Case 15.—A girl, aged 11 months, had been off her feeds and had had diarrhœa for some weeks. She seemed to have recovered from this and was feeding well again, when she suddenly developed status epilepticus. On admission to hospital two hours later she was immediately given 5 ml. of paraldehyde intramuscularly and gr. 2 of phenobarbitone by mouth. Within a quarter of an hour the convulsions ceased. However, occasional twitchings, mainly of the mouth and face, started again some twelve hours later. These never proceeded to grand-mal convulsions and they cleared entirely in about two days. After the initial paraldehyde the patient was given gr. $^1/_4$ of phenobarbitone four-hourly during her stay in hospital. Some months later she had a further status epilepticus, in which she died.

The dose of 5 ml. of paraldehyde in this case probably unnecessarily high and is not recommend as a routine. However, an initial dose of 2 or 3 in infants over the age of 6 months, and 1 or 2 ml. younger infants, is usually necessary to end the fits.

In the foregoing cases intramuscular *ended the convulsions within an hour or so.* Wh barbiturates were used the effect was more delay Thus in case 3 (table I) after the administration of gr of sodium phenobarbitone intravenously the fits c tinued for some four hours, and in case 7 (table despite gr. 6 of sodium phenobarbitone intramuscular the fits continued for three hours, and in each c barbiturates had to be repeated.

In the following case paraldehyde appeared to ha a rapid effect when barbiturates had not modified status epilepticus:

Case 13.—A woman, aged 54, developed status epilepti some ten days after surgical removal of portions of b frontal lobes. She was in hospital at the time, and wit half an hour of the start she was given gr. 3 of sodium phe *barbitone intramuscularly. This was repeated in half* hour, because the fits continued. However, three-quart of an hour later she was still having grand-mal convulsio at intervals of about five minutes. Then, at about 6 P. she was given 10 ml. of paraldehyde intramuscularly. With half an hour the fits ceased entirely and did not recur. T patient slept through that night and thereafter remain drowsy and confused, though able to respond to questio for a further twelve hours. On phenobarbitone and hydant given regularly she has had no further fits.

DISCUSSIONS AND CONCLUSIONS

Prompt measures must be taken to end the convulsio in status epilepticus. The longer the fits contin

TABLE I—RECOVERIES FROM STATUS EPILEPTICUS

Case no.	Age (yr.)	Sex	Type of lesion	Interval between start of status and start of treatment (hr.)	Duration of status epilepticus (hr.)	Treatment	Remarks
1	58	M	Right frontal glioma	$^1/_2$	3	Morphine gr. $^1/_4$. Sod. phenobarbitone gr. 3 I.M.	..
2 (first attack)	18	M	Right frontal brain wound 3 yr. before	$^3/_4$	$1^1/_2$	Paraldehyde 5 ml. I.M.	..
(second attack)	,,	,,	,,	$^1/_4$	$1^1/_2$	Sod. phenobarbitone gr. 5 I.V.	..
3	29	M	Left frontal brain wound 14 mos. before	2	12	Sod. phenobarbitone gr. 3 I.V., repeated in 4 hr.	Serial epilepsy for 24 hr. befor already taking phenobarbito gr. $^1/_2$ t.d.s.
4	21	M	Right frontal tumour	2	10	Paraldehyde 4 drachms per rectum, followed by 2 drachms hourly for 4 hr.	..
5	28	M	Closed head injury 2 yr. before	1	14	*Paraldehyde 1 oz. per rectum,* followed by 2 oz. during 12 hr.	Serial epilepsy for 2 days before
6	33	M	Right frontal brain wound 4 yr. before	$^1/_2$	12	Morphine gr. $^1/_4$ and hyoscine gr. $^1/_{50}$	..
7	20	M	Left frontal glioma	$1^1/_2$	6	Sod. phenobarbitone gr. 6 I.M., repeated in 3 hr.	..
8	39	F	Hyperostosis frontalis	$^1/_2$	6	Morphine gr. $^1/_4$, sod. phenobarbitone gr. 3 I.M., repeated in 3 hr.	Serial epilepsy for 24 hr. before
9	22	M	Closed head injury 3 yr. before	$^1/_2$	1	Sod. phenobarbitone gr. 3 I.M.	..
10	34	F	Cerebral birth injury	$^1/_2$	24	Phenobarbitone gr. $^1/_2$, bromide gr. 15 8-hourly (produced no effect *in 24 hr.), followed by paraldehyde* 8 ml. I.M.	Frequent attacks for 2 days befo
11	4	M	Idiopathic epilepsy	2	7	Paraldehyde 4 ml. I.M., phenobarbitone gr. 1	Serial epilepsy for 24 hr. befor treated with bromides
12	33	M	Closed head injury 4 yr. before	$1^1/_2$	9	Sod. phenobarbitone gr. 3 I.V. 6-hourly, venesection, and lumbar puncture	..
13	54	F	Frontal operation	$^1/_2$	3	Sod. phenobarbitone gr. 3 I.M., repeated in $^1/_2$ hr., then paraldehyde 10 ml. I.M.	..
14	19	F	Cerebral angioma	5	8	Sod. phenobarbitone gr. 3 I.M., *1 hr. later paraldehyde 4 ml. I.M.*	Fits ceased $^1/_2$ hr. *after* para dehyde
15 (first attack)	$^{11}/_{12}$	F	?Idiopathic epilepsy	2	3	Paraldehyde 5 ml. I.M., phenobarbitone gr. 2	No further full fits; *facial* twitc ings for 48 hr.

I.M. = intramuscular. I.V. = intravenous.

iliac fossa. A large gangrenous appendix epiploica was d on the outer side of the cæcum. It was excised and the men closed without drainage. Recovery was uneventful.

ise 4.—A married man, aged 42, was admitted in 1931 plaining of acute abdominal pain of some 24 hours' tion. T., 99·6; P., 100; R., 26. Tenderness was found ie lower quadrants of the abdomen. Per rectum there was erness high up in the rectum. Laparotomy revealed a large grenous appendix epiploica attached to the lateral wall of upper sigmoid colon. It was removed and recovery was ventful.

ase 5.—A married women, aged 46, was admitted in 1935 plaining of acute abdominal pain which had begun denly 12 hours previously. T., 99·2; P., 84; R., 26. re was tenderness all over the lower abdominal quadrants, (per vaginam) in the posterior fornix. Laparotomy aled a large gangrenous epiploica on the anterior surface he lower part of the sigmoid colon. The gangrenous mass excised. Recovery was uneventful and the patient was harged on the 9th postoperative day.

ase 6.—A married man, aged 41, was admitted in 1938, plaining of acute abdominal pain of 20 hours' duration. 100; P., 98; R., 30. Some tenderness was found in the iliac fossa, and (per rectum) high up in the rectal wall. ite-cell count, 16,200. Laparotomy revealed a gangrenous endix epiploica attached to the outer wall of the lower moid colon. The gangrenous appendage was excised and patient made an uneventful recovery.

ase 7.—A married man, aged 36, was admitted in 1939. estinal obstruction had been diagnosed. T., 99; P., 92; 26. Examination showed some abdominal distension, l tenderness in the left iliac fossa; per rectum nothing normal was discovered. Laparotomy revealed a grossly lamed appendix epiploica on the inner side of the upper t of the sigmoid colon. To this appendix was attached a roll great omentum. The omentum was freed and the appendix ploica excised. Recovery was uneventful.

Case 8.—A stoker, was admitted to a Naval hospital in 41, complaining of acute abdominal pain of 12 hours' ration. T., 100; P., 98; R., 30. There was tenderness the left iliac fossa and guarding of the abdominal wall er that region. White-cell count, 12,500. Per rectum thing abnormal was discovered. On abdominal section a ge gangrenous appendix epiploica was exposed on the wall the upper part of the sigmoid colon; it was excised. covery was uneventful.

ANATOMY

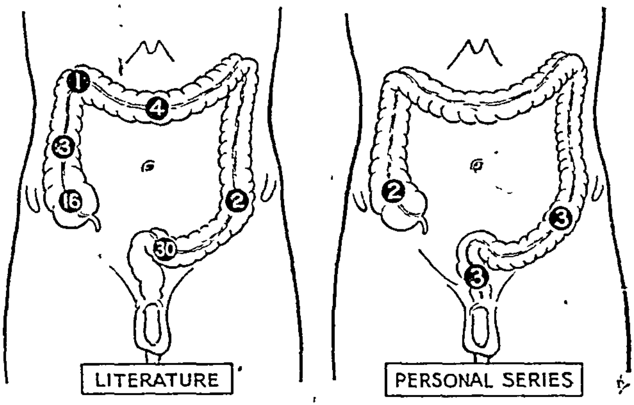
The appendices epiploicæ are found along the whole gth of the large bowel, with the exception of the rectum; ey are most numerous in the transverse and sigmoid lons (see figures). Each appendage is composed of a sac peritoneum containing only fat, with a single artery d a single vein entering and leaving at the attachment the bowel wall. This attachment is a pedicle which ay be of varying size and shape, elongated and narrow, ort and wide. The size of the appendices epiploicæ variable, and they tend to be larger in obese persons. ere is no evidence of any lymphatic drainage.

The fatty tissue of the appendices epiploicæ is conuous with that in the subserous layer of the bowel all. As a rule there is no continuity with any other yer. But McGrath (quoted by Hunt 1919) pointed it that the appendages arose from the bowel over or ar the entry of vessels through the muscle layer. It at these points of entry of vessels that diverticula e sometimes found, and thus appendices epiploicæ re sometimes related to, or even contain, small iverticula.

On occasion, the sac of an umbilical, inguinal, or moral hernia may be found to contain an appendix piploica.

FUNCTION

It seems possible that the appendices epiploicæ form storehouse for fat (Griffin et al. 1942). Patterson quoted by Fiske 1936) has ascribed to them a "buffer" action during the movements of peristalsis. Robinson (quoted by Klingenstein 1924, and by others) suggested that they play a part in the absorptive function of the large gut. It appears more certain that they have a protective and localising action similar to that of the greater omentum in the presence of infection. Klingenstein (1924) found appendices epiploicæ wrapped round an acutely inflamed appendix vermiformis; Hunt (1919) described them forming a protective mass round an inflamed diverticulum. A further function has been suggested by Pines et al. (1941); they described them as protective fat pockets which can take up redundant intestinal vessels when the bowel is collapsed, and which can protect these vessels from obliteration by pressure when the bowel is distended.



The position of diseased appendices epiploicæ as found in a study of the literature and in our personal series.

SURGICAL SIGNIFICANCE

Whatever may be the function of the appendices epiploicæ, they have definite surgical significance. Owing to their shape they are liable to torsion of their pedicle, the more so the larger the size of the appendage relative to the size of the pedicle. Movements of the viscera obviously play a part in the initiation of torsion, but other factors have not been determined. Klingenstein (1924) described one case associated with acute hæmorrhagic pancreatitis and one with acute gangrenous appendicitis. He suggested that sudden migration of the appendage to the seat of infection might initiate torsion.

Torsion of the pedicle cannot always be demonstrated. It is possible that in some of these cases infarction of an appendix epiploica may be caused by embolism or thrombosis of its vessels.

The sequelæ of torsion or infarction depend to some extent on the degree and rapidity of interference with blood-supply. Chronic torsion may give rise to fat necrosis, saponification of the fat, fibrosis, perhaps even calcification. The pedicle may separate from the bowel wall and the separated appendage then forms a foreign body within the peritoneal cavity (Hunt 1919). In more acute cases, hæmorrhages occur into the fatty tissue. Such appendages may organise, and may acquire adhesions to other viscera or to the abdominal wall if the process is limited and remains uninfected. Or a hæmorrhagic gangrenous mass may develop, and this may become infected by direct microbic invasion from the lumen of the bowel because of interrupted continuity (Hunt 1919). In those appendages related to a diverticulum infection may be acquired from the diverticulum. Late stages of the process lead to the formation of an abscess, localised or diffuse peritonitis (Moore 1940).

The inflamed appendage of an acute torsion may acquire adhesion to other viscera or the parietes. As in chronic torsion, a band is thereby formed, and round this sooner or later a loop of bowel may become twisted and obstructed.

five minutes. He had had serial epilepsy for four days previously, and had had an unknown amount of sodium cyclonal intravenously followed by paraldehyde intramuscularly, with only a slight reduction in the number of his fits. Since he appeared dehydrated, a glucose-saline drip was set up at a rate of about 540 ml. (1 bottle) in three hours, through which paraldehyde was given. The subsequent course of fits and medication are shown in table III. *It will be seen that intermittent dosage had little effect, but the maintenance of an effective blood-paraldehyde level stopped the fits within six hours. The very large doses which may be safely used when occasion demands is also well shown. This patient had 202 ml. of paraldehyde intramuscularly in three days.*

Additional clinical evidence of the value of paraldehyde is provided by the experimental work of de Elío et al.[1] who find that intravenous paraldehyde promptly abolishes both the convulsions and the abnormal cortical electrical activity of experimentally induced epilepsy in animals, and the fits induced sometimes during cerebral operations in man. The rapidity with which paraldehyde acts is strikingly shown in their work, and they remark that once the epilepsy has ceased it usually does not recur even though the pharmacological effect of the paraldehyde has worn off.

Other remedies are undoubtedly effective in status epilepticus, but the rapid action and relative safety of paraldehyde make it the drug of election. If it is not available, an attempt should be made immediately to stop the fits by other means, because it is essential that the fits be interrupted as rapidly as possible. If phenobarbitone is used it should be given in doses of gr. 6–12, smaller doses being of little value, and preferably in the "soluble" form by intramuscular or intravenous route. Thiopentone in anæsthetic doses may be used, or chloroform anæsthesia if no other remedy is at hand. But the effect of these methods is often short-lived, and it may be necessary to establish heavy sedation by other means and to maintain this for twenty-four hours or longer afterwards if the fits tend to recur. The respite given by the immediate measures is probably best used in establishing paraldehyde sedation. Though cases of status epilepticus at times seem to subside practically without treatment, it is safest to regard every case as potentially fatal and to act accordingly.

Once status epilepticus has been controlled, the patient must be put on regular anticonvulsant therapy, of which the barbiturates and hydantoins remain the most convenient and widely used. The patient should clearly understand that the regular use of these medicines for an indefinite period is essential to avoid a recurrence of the convulsions.

The commonest setting for status epilepticus is as an episode or the terminal event in idiopathic grand-mal epilepsy. However, it can also occur as the first manifestation of a traumatic epilepsy or of a symptomatic epilepsy from cerebral neoplasm, as Clark and Prout[2] have noted. When status epilepticus occurs during the course of an established epilepsy it is often preceded by an increased frequency of individual attacks, which may become so numerous as to constitute serial epilepsy. This gives timely warning of a possible status epilepticus; hence anticonvulsant therapy can be appropriately increased. In 9 of the 25 cases reviewed here there was such a preliminary increase of fits. The omission of the patient's usual anticonvulsants in either symptomatic or idiopathic epilepsy is a common precipitating factor of status epilepticus. This should be explained to those liable to be careless about their medication.

SUMMARY

The treatment and course of 25 cases of status epilepticus are reviewed.

This condition constitutes a grave medical
and may be fatal unless the fits are rapidly

A régime of treatment considered to be safe effective, based on the use of intramuscular or i venous paraldehyde, is described.

Our thanks are due to Dr. Victoria Smallpeice, phy in charge of the children's department, Radcliffe Infirm under whose care four of the patients were admitted, and Dr. W. Ritchie Russell, who provided facilities for revie the head-injury cases and helped us with valuable criti

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TORSION AND OTHER AFFECTIONS O THE APPENDICES EPIPLOICÆ

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Morbid conditions of the appendices epiploicæ, whi cause symptoms and signs of acute or subacute abdomi disease, and necessitate urgent surgery, are uncommo 64 such cases have been reported (Hunt 1919, Kling stein 1924, Fiske 1936, Pines et al. 1941, Marinis a Check 1949). *This number does not include those runni* a chronic course, those in which appendices epiploi situate within hernial sacs are diseased, those associat with other acute disease, or those in which diseas appendices epiploicæ are found incidentally at operatio or at autopsy. To these previous reports and review we wish to add 8 further cases from the case-records *of one of us (C. W.).*

CASE-HISTORIES

Case 1.—*A married man, aged 36, was admitted to hospital in January, 1915, as a case of acute appendicitis. He gave a history of right-sided abdominal pain which had started quite suddenly 24 hours before admission. Temperature 100°F; pulse-rate, 92; respirations, 30. Examination showed considerable guarding over the right iliac fossa, and a small lump could be palpated. Operation was performed an hour after admission, through a muscle-splitting incision over the right iliac fossa. There was some bloodstained free fluid inside the abdomen. On lifting the cæcum out of the abdominal cavity a large gangrenous appendix epiploica was seen on the outer side of the cæcum. The appendix vermiformis was normal and overhung the pelvic brim. The gangrenous fatty lump was excised and its attachment to the cæcum invaginated with a purse-string suture. The vermiform appendix was also removed. The patient made an uneventful recovery.*

Case 2.—*A married woman, aged 39, was admitted in June, 1921, complaining of acute abdominal pain and vomiting. The pain had commenced after she had passed a constipated motion. On admission she was acutely ill. T., 99; P., 120; R., 32. There was considerable guarding of the lower quadrants of the abdomen. Per vaginam there was some tenderness in the posterior fornix, and per rectum some tenderness in the upper part of the anterior rectal wall. The diagnosis of torsion of the left ovary was made. A laparotomy was performed through a midline incision and a gangrenous appendix epiploica was found on the lower part of the sigmoid colon; it was excised. Recovery was uneventful.*

Case 3.—*A boy, aged 19, was admitted in 1929 complaining of acute abdominal pain, of 48 hours' duration, limited to the right iliac fossa. Appendicectomy had been performed 3 years before admission. T., 99·8; P., 96; R., 28. There was definite tenderness and guarding over the right iliac fossa. As the appendix vermiformis had been removed previously it was decided to watch the patient for 12 hours. There was a leucocytosis of 18,000 by the following day and the temperature had risen to 101°. Operation was decided upon. The old operation scar was excised and the abdomen opened over the*

1 included all those with healthy gums, class 3 with advanced gingival disease, and class 2 those gingival state was moderately satisfactory. In assification no account was taken of the presence tal caries.

the extractions were carried out under general esia with nitrous oxide and oxygen, occasionally mented by trichlorethylene. The first blood e was taken as soon as the patient was unconscious. ecessary extractions were then performed, usually ntal students under the supervision of the dental n in attendance. Immediately after the last tooth een withdrawn, and while the patient was still scious, a second blood sample was taken. No pt was made, by subsequent blood-cultures, to ine the duration of bacteræmia.

specimen of blood consisted of 10 ml. and was distri- immediately as follows: (1) 4 ml. into 50 ml. of 0·15% broth containing 0·3% sodium citrate; (2) 2 ml. ml. of 1% sodium citrate; and (3) the remainder into sterile bottle from which serum was separated for other ations.

return to the laboratory 1 ml. of citrated blood was with 12 ml. of melted agar and poured into a petri r quantitative estimation of the intensity of bacteræmia. mainder was added to a bottle of Robertson's meat-medium.

r 24 hours' incubation in glucose broth at 37°C, was usually visible in the form of discrete clumps surface of the blood-cells, which had settled into an even at the bottom of the bottle. Occasionally growth was from the start—most often when the quantitative was high. Subcultures were made on 5% horse-blood- lates incubated aerobically, and representative colonies picked off and examined in pure culture.

II—RELATION BETWEEN NUMBER OF TEETH EXTRACTED AND INCIDENCE OF STREPTOCOCCAL BACTERÆMIA

al ory	0–5 teeth extracted		6–10 teeth extracted		11 or more teeth extracted	
	Total no. of patients	No. and per-centage positive	Total no. of patients	No. and per-centage positive	Total no. of patients	No. and per-centage positive
1	34	11 (29·4%)	11	7 (63·4%)	6	5 (83·3%)
2	20	7 (28·5%)	24	10 (41·7%)	60	40 (66·6%)
3	2	Nil	14	6 (43·6%)	29	22 (78·5%)
..	56	18 (32·1%)	49	23 (46·9%)	95	67 (70·5%)

tures in Robertson's meat were examined by gram- d smears, and were subcultured anaerobically on horse-agar plates. Any streptococci isolated from anaerobic es were tested for their ability to grow aerobically. trictly anaerobic streptococci were found, though a er of other strict anaerobes were encountered.

RESULTS

ch of us independently investigated 100 patients r similar conditions, with results which were rally comparable and have been combined in the wing analysis.

ith one exception—where a diphtheroid was ered—all preoperative specimens were sterile. ng into account all types of organisms, positive operative cultures were obtained in 113 (56·5%) e 200 cases. Streptococci predominated. and were ered from 108 (54%); diphtheroids were grown 5, and obligatory anaerobic gram-negative cocci 6. Several patients had mixed infections, either of rent organisms or of different strains of streptococci. classification of streptococci in dental bacteræmia cussed in another paper (Porterfield 1949).

Diphtheroids are often regarded as contaminants in blood-cultures, but in this investigation it is probably justifiable to regard them as having originated in the mouth. Their frequency in the oral cavity, together with the fact that in several cultures they were mixed with streptococci, supports this view, which is shared by Okell and Elliott (1935) and Hirsh et al. (1948).

The anaerobic gram-negative cocci were found in 6 patients in the second hundred investigated, and were identified as *Veillonella gazogenes* (Bergey 1948). Hall and Howitt (1925) recovered this organism from normal saliva, so its presence in the blood-stream after dental extractions need occasion no surprise. It was probably present in some of the first hundred cultures, but at that time its significance was not appreciated.

TABLE III—RELATION BETWEEN INCIDENCE OF BACTERÆMIA AND DURATION OF OPERATION

Dental category	Duration of operation			All times
	0–5 min.	6–10 min.	11 + min.	
Class 1 ..	2 out of 6	2 out of 2	1 out of 1	5 out of 9
Class 2 ..	6 ,, ,, 13	3 ,, ,, 4	3 ,, ,, 3	12 ,, ,, 20
Class 3 ..	3 ,, ,, 5	0 ,, ,, 0	3 ,, ,, 3	6 ,, ,, 8
All ..	11 ,, ,, 24	5 ,, ,, 6	7 ,, ,, 7	23 ,, ,, 37

Table I shows the relation between the condition of the patients' gums and the incidence of streptococcal bacteræmia. Positive postoperative cultures were obtained from 45·1% of patients in class 1, from 54·8% in class 2, and from 68·8% in class 3. This apparent increase in the incidence of bacteræmia with increasing severity of gum disease conforms with the findings of Okell and Elliot (1935), who used a similar method of classification. However, since patients with badly diseased gums generally required multiple extractions, whereas those with healthy gums received less extensive treatment, it seemed possible that these figures might be misleading. The frequency of positive cultures was therefore related to the number of teeth extracted, and the results are presented in table II. When five or fewer teeth were removed, 32·1% of the postoperative cultures were positive; with removal of six to ten teeth, 46·9% were positive; and with removal of eleven or more teeth, 70·5% were positive. Moreover, when these figures were subdivided according to the state of the gums, it became clear that bacteræmia was no more likely to arise in a patient in class 3 than in a patient in class 1 who was subjected to the same number of extractions.

Another factor which seemed likely to influence the incidence of bacteræmia was the duration of the operation. This was recorded in 37 patients, and the results are presented in table III. The column on the right shows that, as in the whole series, there are more positive cultures in class 2 than class 1, and more in class 3 than class 2. The incidence of bacteræmia is related to the duration of the operation (without regard to the dental class) in the last line of the table. When the procedure lasted five minutes or less, 11 out of 24 postoperative

TABLE IV—RECOVERY OF *Chr. prodigiosum* FROM BLOOD-CULTURES AFTER APPLICATION OF THAT ORGANISM TO GUMS IMMEDIATELY PRIOR TO EXTRACTIONS

Dental category	Total no. of patients	Number and percentage positive
Class 1	8	3 (37·5%)
Class 2	16	7 (43·7%)
Class 3	5	2 (40·0%)
All	29	12 (41·4%)

If an appendix epiploica is lying within a hernial sac it may undergo torsion within the sac. If adherent to or wrapped round an inflamed appendix vermiformis or diverticulum, an appendix epiploica will share in the inflammatory process.

More than one appendix epiploica may be involved (Hunt 1919, Pines et al. 1941).

CLINICAL PICTURE

We are not concerned with cases in which appendices epiploicæ become secondarily involved in disease, nor with those cases showing no acute manifestations.

Hunt (1919) described the incidental finding of a strangulated appendix epiploica in the absence of any symptoms and signs. It is quite probable that a certain number of cases with complaint of unexplained mild attacks of abdominal pain are due to subacute or chronic torsion of appendices epiploicæ (Moore 1940).

The condition is most commonly seen between the ages of 20 and 60; men and women are equally affected. Often there is a history of previous attacks of abdominal pain. The current attack has lasted from a few hours up to 6 or 8 days. Abdominal pain is the chief complaint. It may be sudden or gradual in onset, and is described as aching, sharp, or colicky. The site of the pain varies with the site of the affected appendage. The sigmoid colon is the most common site, and pain is most often referred in these cases to the left iliac fossa, but may spread centrally, and occasionally to the right side. Torsion of appendages of the cæcum, the next most common site, give rise to pain in the right iliac fossa. If a strangulated appendix epiploica is lying in the pelvis, pain is experienced in the lower abdomen.

The patient is usually not acutely ill. There is some fever, 99–101°F. The pulse and respiration rates are raised. Nausea and vomiting may both occur but are more often absent. Appetite and bowels are usually unaffected. In some of the more severe cases there is a polymorphonuclear leucocytosis.

Examination of the abdomen reveals signs dependent upon the site of the strangulated appendage. There is no generalised rigidity, but guarding of varying degree can be detected over the affected area. Marked local tenderness is found over the strangulated appendix epiploica, and there may be rebound tenderness. Pines et al. (1941) noted hyperæsthesia of the skin. In some cases a mass may be felt in the abdomen. In cases with strangulated appendices epiploicæ lying in the pelvis, examination of the pelvis per rectum will reveal tenderness, and sometimes a mass.

An appendix epiploica which undergoes torsion within a hernial sac will give the signs of a strangulated hernia. Cases in which an appendage has formed a band, and in which a loop of bowel has become obstructed will exhibit the signs of intestinal obstruction.

DIFFERENTIAL DIAGNOSIS

There are no pathognomonic features of torsion of an appendix epiploica on which a diagnosis can be made preoperatively. When torsion occurs in a cæcal appendage and an appendicectomy has been performed previously, the diagnosis may be made tentatively; Babcock did so in one case (Fiske 1936), and this diagnosis was suggested in one of our cases (no. 3).

The commonest diagnosis made before operation is acute or subacute appendicitis. Pines et al. (1941) point out that a differential feature is the disproportion between abdominal tenderness, the duration of symptoms, and abdominal rigidity in torsion of an appendage.

Sigmoiditis, diverticulitis, cholecystitis, torsion of ovarian cyst, degeneration in fibromyoma, strangulated hernia, neoplasm of bowel, intestinal obstruction, and mesenteric thrombosis are the other preoperative diagnoses which are made.

TREATMENT

Treatment is excision of the strangulated ap epiploica.

SUMMARY

Eight cases of torsion of appendix epiploica rise to acute abdominal symptoms are added to six previously reported.

The anatomy, function, and surgical signific appendices epiploicæ are discussed.

The clinical features and differential diagn torsion of appendices epiploicæ are described.

The treatment is excision of the strangulated appendage.

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BACTERÆMIA FOLLOWING DENTA EXTRACTIONS

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Transient invasion of the blood-stream by ba from the mouth as a result of dental extractions wa demonstrated by Okell and Elliott (1935), who that 60·9% of 138 people subjected to dental extra under general anæsthesia subsequently had a st coccal bacteræmia. Later Elliott (1939) showed mere rocking of the teeth with dental forceps in streptococcal bacteræmia in 18 out of 21 patients severe gum disease and in no less than 5 out of 20 pa without detectable gum disease.

Burket and Burn (1937) found positive cu in 17% of patients after extractions under local thesia, and a similar proportion was reported by P and Kempf (1939). Few accounts record such a incidence as that reported by Okell and Elliott.

METHOD

The following observations, made at the Liv *Dental Hospital, form part of an investigation* in pathogenisis of subacute bacterial endocarditis.

After having their mouths inspected in one de ment, those patients needing extractions were not to take any solid food after 10 P.M. and to r to the extraction department the next morning. E tionally teeth might be removed on the day of attendance when some condition, such as acute a abscess, made immediate treatment desirable.

After the purpose of the experiment had been expla and permission to take blood granted, the conditi *the patient's gums was assessed in one of three categ* by the dental surgeon in charge of the extraction-r

TABLE I—RELATION BETWEEN CONDITION OF GUMS INCIDENCE OF STREPTOCOCCAL BACTERÆMIA IMMEDIA AFTER DENTAL EXTRACTIONS

Dental category	Patients	
	Total no.	No. a percent positi
Class 1 (healthy)	51	23 (45
Class 2 (moderate gingival disease) ..	104	57 (5
Class 3 (severe gingival disease)	45	28 (6
All	200	108 (5

at the age of 1–7 years with that of their siblings. ound that by the age of 4 or 5 years the premature had fully caught up with the physical development of l-term child. Girls reached the normal weight earlier oys. The smaller the birth weight the slower the gain in weight and, to a lesser extent, in height.

me (1944) states that a baby weighing 5 lb. at birth ch a normal stature by the age of 4 or 5 years, whereas weighing 4 lb. or under at birth will always be small. e (1946) says that the physical development of prema- abies is relatively slow during "the first years of life," fter this it becomes normal, though some children below the average in weight and height. She does e figures, however, to support this statement.

ne and Gordon (1942) claim that premature birth has nificant effect on physical development, provided that e of the infant is reckoned from the date of conception. pö (cited by Dunham 1948) concludes that the growth emature infant usually shows a well-marked disturbance first 3–5 years of its life, and thereafter is normal. maller the baby at birth the more the weight and height hind the normal. He ascribes this defect to rickets and nutrition.

mmerer (1908) notes that children of small birth weight lag behind those of normal birth weight for many years. f his charts shows a difference of 6 lb. at the age of rs.

pper (1928) studied the growth of 62 premature boys 9 premature girls. He found that they had a sub- al weight even at the age of 14 or 15. The smaller the t at birth the longer the subnormality persisted. The were further below the normal weight than the girls, as the girls tended to be further below the normal t. Most of the children were of the asthenic type a long trunk, thin arms and legs, little fat, and poor lature.

n Sydow (1936) found underdevelopment in 99 premature en whom he examined at the age of 3–9 years. Forschner- (1924) and Brander (1941) found similar retardation. r (1946) found 217 premature babies underweight at the f 1–6 years.

llien (1948) found that the average weight at any given ses steadily with the birth weight. She found an average ence of 2 lb. at the age of 2 years between the children smallest birth weight (4 lb. 8 oz. or less) and those of a birth weight (8 lb. 9 oz. or more). At the age of 3 years ifference was 6 lb., and at 4 years it was 7 lb.

en and Blumberg (1948), in an investigation of 40 cases explained dwarfism in Boston, showed that the dwarfs a birth weight averaging 1·1 lb. below that of normal en. There was a positive correlation between birth t and subsequent thinness.

BLE I—RELATION OF BIRTH WEIGHT TO SUBSEQUENT WEIGHT IN BOYS

s)	Group D: birth weight 9 lb. 9 oz. (4337 g.) or more		Group C: birth weight from 8 lb. 8 oz. (3856 g.) to 9 lb. 8 oz. (4309 g.)		Group B: birth weight from 7 lb. 2 oz. (3238 g.) to 7 lb. 6 oz. (3351 g.)		Group A: birth weight 5 lb. 8 oz. (2495 g.) or less	
	No. of children	Mean weight (kg.)	No. of children	Mean weight (kg.)	No. of children	Mean weight (kg.)	No. of children	Mean weight (kg.)
	12	14·0	45	13·1	13	12·3	21	11·3
	6	14·6	13	14·6	..	..	8	13·6
	..	..	11	14·1	6	14·7	9	13·7
	..	..	9	16·6	..	..	..	..
	..	..	..	..	5	17·6	5	14·6
	11	19·9	42	19·7	17	18·4	16	17·2
	36	20·8	125	19·8	83	18·7	57	18·4
	34	21·6	119	21·0	96	20·2	44	18·3
	33	22·9	76	21·9	75	21·2	32	19·2
	20	23·4	63	23·4	69	21·4	22	21·9
	30	25·1	72	23·8	63	23·1	20	22·8
	21	26·6	72	25·5	67	24·1	32	22·7
	31	26·9	73	26·9	68	25·4	26	23·9
	21	29·1	73	28·2	59	26·0	34	25·9
	29	30·1	42	29·6	46	28·9	30	26·2
	20	29·5	71	30·8	42	28·2	24	28·5
	28	33·0	70	31·7	43	30·7	29	26·7
	15	32·5	69	33·0	41	31·5	19	28·5
	26	35·9	70	35·7	41	34·4	18	28·8
	14	36·3	45	35·4	20	34·9	16	32·9
	21	37·6	45	36·9	31	36·3	20	31·7
	6	40·8	28	37·3	13	37·8	10	37·9
	7	40·0	25	40·6	10	40·0	..	..

TABLE II—RELATION OF BIRTH WEIGHT TO SUBSEQUENT WEIGHT IN GIRLS

Age (years)	Group D: birth weight 9 lb. 9 oz. (4337 g.) or more		Group C: birth weight from 8 lb. 8 oz. (3856 g.) to 9 lb. 8 oz. (4309 g.)		Group B: birth weight from 7 lb. 2 oz. (3238 g.) to 7 lb. 6 oz. (3351 g.)		Group A: birth weight 5 lb. 8 oz. (2495 g.) or less	
	No. of children	Mean weight (kg.)	No. of children	Mean weight (kg.)	No. of children	Mean weight (kg.)	No. of children	Mean weight (kg.)
2	..	..	46	12·8	13	12·7	15	11·2
2½	..	..	15	13·7	..	..	9	12·2
3	..	..	13	14·1	..	..	8	13·4
3½	..	..	13	15·2	..	..	8	13·2
4	..	..	8	18·6	..	..	6	15·5
4½	..	..	25	18·3	15	17·3	22	16·4
5	25	20·1	86	19·4	68	18·2	69	17·4
5½	25	20·5	97	19·8	69	19·1	62	17·5
6	10	22·5	68	21·5	67	19·9	45	18·9
6½	15	22·6	55	22·3	58	21·0	42	19·5
7	12	25·1	56	23·7	55	21·5	35	20·0
7½	20	25·1	60	24·6	62	23·0	47	21·6
8	10	27·8	65	25·7	70	24·7	45	22·0
8½	14	27·0	60	26·1	62	26·0	41	23·9
9	15	29·8	63	28·3	59	26·4	49	24·8
9½	12	29·9	56	29·7	49	29·0	38	26·0
10	15	33·8	56	31·8	51	30·0	30	26·5
10½	9	31·6	59	32·9	35	31·6	34	26·7
11	10	36·1	48	35·8	35	32·1	27	30·3
11½	6	35·1	32	35·5	23	33·8	24	34·2
12	6	36·3	32	39·7	16	37·2	16	34·7
12½	..	..	18	39·8	13	38·1	19	37·9
13	5	38·5	10	44·8	7	43·6	8	39·8

Dunham (1948), in a very complete review of prematurity, sums up by saying: "It must be admitted that no entirely satisfactory norms for the growth of premature infants have been established. Additional data need to be collected in order to answer the primary question of the expected rate of growth of a premature infant of a given birth weight from birth to the period at which the infant may be considered mature."

From the experimental work in animals reviewed by Huggett (1946) it might certainly be thought likely that birth weight would influence subsequent growth. Marshak (1936) demonstrated this in rats.

Still less has been written about the subsequent physical development of children who had a large birth weight. Gray and Eder (1941) compared the physical development in later childhood of 12 children who had weighed at birth more than 8 lb. 13 oz. with that of 12 normal controls, and found that those who had been large babies were heavier. Mossberg (1948), in an investigation of obesity in childhood, found that there was a tendency to a large birth weight in the children studied.

PRESENT STUDY

The present study was based on the maternity and child-welfare and school medical service records of children in Sheffield and an adjacent area of the West Riding of Yorkshire.

The investigation covers all children born between 1935 and 1943 whose records could be obtained and who fell into one of the following birth-weight groups:

(A) 5 lb. 8 oz. or less.
(B) 7 lb. 2 oz.–7 lb. 6 oz.
(C) 8 lb. 8 oz.–9 lb. 8 oz.
(D) 9 lb. 9 oz. or more

There were 517 children in group A (207 boys, 310 girls), 712 in group B (364 boys, 348 girls), 940 in group C (530 boys, 410 girls), and 257 in group D (163 boys, 94 girls). Twins were included in the series. It was impossible to subdivide group A further, because of the few records available for children who had been very small premature babies.

The birth weights of children born on the district were obtained from the midwives' antenatal charts, and of those born in hospital either direct from the hospital or from the infant-welfare charts. The birth weight is obtained for the latter from a note brought by the cultures were positive; when the time was more than five minutes, 12 out of 13 were positive. The numbers in each group are small, but the results support the view that the duration of the operation is more important than the state of the patient's gums in determining the incidence of bacteræmia.

In 29 instances a suspension of a non-pathogenic organism *Chromobacterium prodigiosum* (*Serratia marcescens*) was applied to the gums immediately before teeth were extracted, as in the experiments of Burket and Burn (1937). Blood-samples were cultured in the usual way, and were examined for the presence of *Chr. prodigiosum.* The results are presented in table IV. The indicator organism was recovered from 12 patients (41·4%); there is no apparent relation to the dental category, but the numbers are too small to be significant.

Quantitative counts showed the intensity of bacteræmia to be low. More than two-thirds of all counts were below 10 colonies per ml. blood, and only 6 were above 25 colonies per ml. In subacute bacterial endocarditis the intensity ranges commonly from 20 to 200 colonies per ml., although it may range from less than 1 to over 1000. It was not possible to relate the intensity of the bacteræmia to the dental category of the patient or to the number of teeth extracted.

DISCUSSION

Okell and Elliott (1935) related the incidence of bacteræmia to the degree of oral sepsis; Burket and Burn (1937) considered that both oral sepsis and the amount of operative trauma were significant; Hirsh et al. (1948) were unable to correlate the incidence of bacteræmia with age, sex, race, state of oral hygiene, or number of teeth extracted, but reported that the more extensive the surgical procedure the greater was the number of positive cultures. Analysis of our results shows that the apparent relation of the incidence of bacteræmia to the extent of oral sepsis is illusory, but that the number of positive cultures is proportional to the amount of trauma as indicated by the number of teeth extracted and by the duration of the operative procedure. The experiments in which *Chr. prodigiosum* was employed indicate that any organism applied to the gum margin may enter the blood-stream as a result of dental extractions, irrespective of the severity of infection prevailing in the mouth.

The finding of *Veillonella gazogenes* in blood-cultures from 6% of normal people is of interest since this organism has been reported as a cause of subacute bacterial endocarditis (Loewe et al. 1946). This organism was never recovered by the usual technique of blood-culture in bottles of nutrient broth; and possibly attention to anaerobic methods might reveal this organism as the cause of other infections and might explain certain cases of subacute bacterial endocarditis in which the clinical picture is characteristic but repeated blood-cultures are reported as negative.

Prophylactic sulphonamides or penicillin have been recommended for patients with congenital or rheumatic heart-disease who require dental treatment. These agents cannot be expected to prevent bacteræmia, since this is a mechanical phenomenon; and claims that they have this effect have usually been due to failure to neutralise the circulating agent by the addition of *p*-aminobenzoic acid or penicillinase to the culture-medium. When adequate methods have been employed, as by Hirsh et al. (1948), a slight but significant reduction in the incidence of streptococcal bacteræmia (from 34 to 15% by Hirsh et al.) has been noted. These workers suggest that penicillin may act by reducing the number of organisms in the gums and also by preventing the multiplication of those which do enter the blood-stream. They recommend the administration of 300,000 units of penicillin in wax and oil twenty-four hours prior to extractions, supplemented by a further 600,000 units of the same preparation three to fo before the operation.

SUMMARY

Blood-cultures taken from 200 patients imm after dental extractions under general anæsthesia streptococcal bacteræmia in 54%. The incid bacteræmia was unrelated to the extent of oral but was related to the trauma of the operation cated by the number of teeth removed and the d of the operation.

In addition to streptococci and diphtheroids, o anaerobic gram-negative cocci identified as V *gazogenes* were recovered from 6 out of 100 of blood-cultures.

We wish to thank Prof. H. H. Stones for his k granting facilities for this work at the Liverpool Hospital; and also Mr. H. E. Ballance, Mr. F. E. Lawt Mr. E. Wynn Davies who supervised the extract assessed the dental condition of each patient.

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RELATION OF BIRTH WEIGHT TO PHYSICAL DEVELOPMENT IN CHILDH

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ONE of us (R. S. I.) observed, in the outpatient de ment of the Hospital for Sick Children, Great Or Street, London, that a notable proportion of chi who were below the average weight had been babies at birth. This led to a study (Illingworth in which the weights at various ages of 150 children at birth weighed $5^{1}/_{2}$ lb. or less were compared wit weights of 150 consecutive children who at birth wei $8^{1}/_{2}$ lb. or more. In these London children there w considerable difference between the two groups a ages, those who had been small at birth lagging behind those who had been heavy babies at b Thanks to the coöperation of Dr. H. M. Cohen, school medical officer in Sheffield, and Dr. A. B the principal maternity and child-welfare office making their records available for study, this work now been amplified and confirmed.

There are relatively few published references to relation of weight at birth to subsequent phy development.

Hess and Chamberlain (1927) and Hess and Lundeen (state that premature* infants can be made to reach a no weight if supplementary feeding is maintained for four y Hess and others (1934) compared the growth of 250 prema

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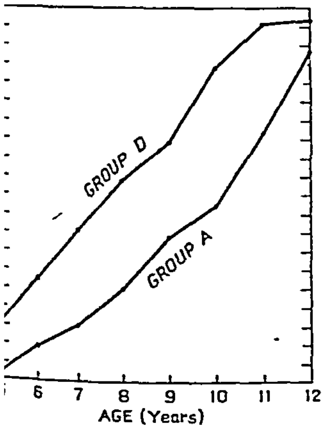
* A baby is said to be premature if it weighs 5 lb. 8 oz. or l birth, irrespective of the duration of gestation.

; C and D fell into this category. At the age of years 15·7% of 140 children in group A were below the average weight, compared with 1% of ildren in group B, 1·1% of 279 children in group C, 3% of 76 children in group D.

differences in height in the four groups are less inced but nevertheless definite. Tables III and IV that there was a difference of about 2–6 cm. in ight at all ages between children of small birth and those of large birth weight.

e the difference in height was less than the nce in weight, it follows that the weight/height vas greater for children of large birth weight than ose of small birth weight. Weight at birth is ore distinctly related to the status of a child as determined by such methods as the Wetzel grid and Tuxford index, which are based on the weight/height ratio. Wetzel (1948) has given a full review of his grid technique.



Growth curves of girls (data as for boys in fig. 1).

When the weight and height of children of different birth-weight groups are plotted on the Wetzel grid, it is found that children of group A fall considerably those of group D in "developmental level" and to r extent in physique. The "developmental level" id by plotting weight and height against age, and hysique by plotting weight against height. The pmental levels are arranged in percentiles. A plot- 1 the 80th percentile implies that 80% of children a developmental level which is superior to his. igures for all 70 children in group A at the age years and for all the 41 children in group D same age were plotted on the grid; 25·1% of A and 78% of group D fell above the 67th or "normal" percentile, whereas 4·8% of group D and 34·3% of group A fell below the 82nd percentile, 17·1% of group A being so far below the average that they fell below the 98th percentile.

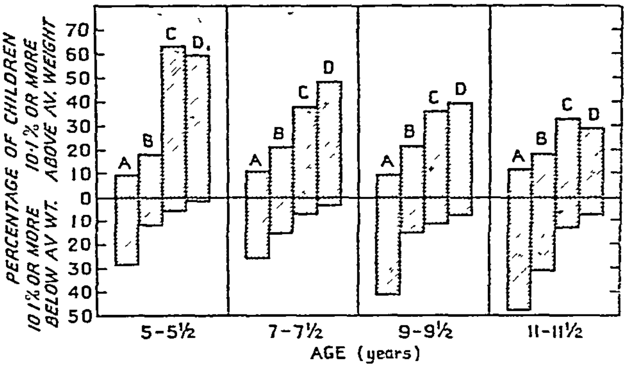


Fig. 3—Summary of table V, showing relation of birth weight to subnormal and supernormal weight in later childhood: A, birth weight 5 lb. 8 oz. or less; B, birth weight from 7 lb. 2 oz. to 7 lb. 6 oz.; C, birth weight from 8 lb. 8 oz. to 9 lb. 8 oz.; D, birth weight 9 lb. 9 oz. or more.

Another method of assessing nutritional status was described by Tuxford (1917, 1942), who devised a formula from the weights and heights of London elementary school-children which gives the optimal ratio of weight to height at various ages. The index for London school-children in 1938 was 1. The formula necessitates a simple calculation for each child, and Campbell and Weir (1948) devised a nomogram from which Tuxford's index can be obtained in a few seconds. For the purposes of this study the age of 7 years was chosen at random, and the mean was obtained for children in each birth-weight group. The mean indices were as follows:

	Weight at birth	*Total no. of children (both sexes)*	*Mean Tuxford index*
Group A:	5 lb. 8 oz. or less	54	0·95
Group B:	from 7 lb. 2 oz. to 7 lb. 6 oz.	120	1·00
Group C:	from 8 lb. 8 oz. to 9 lb. 8 oz.	129	1·04
Group D:	9 lb. 9 oz. or more	40	1·10

Both Tuxford and Wetzel emphasise that the chief value of their methods lies in the study of the pattern of a child's growth rather than in isolated readings. Since the birth weight is related to the weight and height in the same way throughout childhood, it follows

ABLE V—RELATION OF BIRTH WEIGHT TO SUBNORMAL AND SUPERNORMAL WEIGHT IN LATER CHILDHOOD (BOTH SEXES)

No. of children in each group*	Percentage 30·1% or more above normal weight	Percentage 20·1–30% above normal weight	Percentage 10·1–20% above normal weight	Percentage 10% or less above or below normal weight	Percentage 10·1–20% below normal weight	Percentage 20·1–30% below normal weight	Percentage 30·1% or more below normal weight
Group A: 232	1·3	0·4	7·8	61·6	19·4	8·6	0·9
,, B: 320	1·2	4·7	11·9	70·3	10·9	0·6	0·3
,, C: 263	8·3	19·8	35·0	31·2	5·7	0	0
,, D: 120	7·5	16·7	35·0	39·1	1·7	0	0
,, A: 134	0·7	3·0	6·7	63·6	14·9	10·4	0·7
,, B: 247	1·6	4·1	14·6	64·4	12·9	2·4	0
,, C: 260	6·2	8·5	22·7	55·7	6·9	0	0
,, D: 81	9·8	16·0	22·2	48·3	3·7	0	0
,, A: 140	0·7	3·6	5·0	49·3	25·7	14·3	1·4
,, B: 199	3·0	5·0	13·0	63·5	14·5	1·0	0
,, C: 279	5·7	9·3	20·7	52·6	10 6	1·1	0
,, D: 76	6·6	10·5	22·3	52·8	6·5	1·3	0
,, A: 78	2 6	2·6	6·4	41·0	28·2	17·9	1·3
,, B: 90	2·2	7·7	7·7	51·4	26 6	4·4	0
,, C: 194	7·7	10·4	14·4	54·6	10·8	2·1	0
,, D: 56	7·1	7·1	14·3	64·4	7·1	0	0

* Group A, children who at birth weighed 5 lb. 8 oz. or less.
,, B, ,, ,, ,, ,, from 7 lb. 2 oz. to 7 lb. 6 oz.
,, C, ,, ,, ,, ,, from 8 lb. 8 oz. to 9 lb. 8 oz.
,, D, ,, ,, ,, ,, 9 lb. 9 oz. or more.
The figures were calculated separately for each sex and combined for the purposes of the table.

TABLE III—RELATION OF BIRTH WEIGHT TO SUBSEQUENT HEIGHT IN BOYS

Age (years)	Group D : birth weight 9 lb. 9 oz. (4337 g.) or more		Group C : birth weight from 8 lb. 8 oz. (3856 g.) to 9 lb. 8 oz. (4309 g.)		Group B : birth weight from 7 lb. 2 oz. (3238 g.) to 7 lb. 6 oz. (3351 g.)		Group A : birth weight 5 lb. 8 oz. (2495 g.) or less	
	No. of children	Mean height (cm.)	No. of children	Mean height (cm.)	No. of children	Mean height (cm.)	No. of children	Mean height (cm.)
4½	9	107·7	29	106·9	15	105·2	9	103·3
5	33	106·3	181	109·3	82	107·8	38	104·2
5½	31	113·2	163	112·1	97	110·4	38	107·5
6	32	115·5	71	114·1	74	113·3	29	110·7
6½	20	117·5	62	114·9	66	112·0	21	113·0
7	30	120·4	73	120·5	63	118·9	21	117·7
7½	21	123·6	72	123·8	67	120·7	31	119·1
8	31	125·8	71	126·9	64	125·9	26	120·7
8½	21	128·8	73	128·3	58	125·0	34	125·5
9	29	130·6	85	130·9	47	130·0	30	126·0
9½	20	131·3	75	132·9	47	131·7	24	129·9
10	23	137·7	71	135·8	46	134·0	27	130·1
10½	18	136·0	69	138·2	45	139·0	19	132·2
11	26	139·3	70	140·5	40	139·8	17	133·3
11½	14	143·2	45	141·9	17	141·3	16	139·5
12	20	142·7	44	144·3	31	143·6	20	137·0
12½	6	150·3	29	146·7	11	144·8	10	144·8
13	7	147·1	25	148·0	10	148·0	4	137·1

mother from the hospital to the child-welfare centre. It was realised that the mother's memory of the birth weight of her child, a few years after it had been born, would be inaccurate. When 110 mothers were asked to give the birth weight of their babies born five years previously in a maternity hospital, in which we had accurate records of the birth weight, 83·9% knew the birth weight correctly to within 4 oz., but 10·4% made an error of over 8 oz. It was therefore clear that no investigation dependent on the mothers' memory of birth weights would be accurate.

The weights and heights in later childhood are those recorded by the child-welfare and school medical officers.

It is fully realised that there may be inaccuracies in the figures recorded for weight at birth and for the weight and height in later childhood. The essential point, however, is that the errors would apply equally to all four birth-weight groups and would therefore not be significant. Records show, as one would expect, that the birth-weight groups were scattered approximately evenly through the various schools.

RESULTS

Tables I–IV show the mean weights and heights at various ages of children belonging to the four birth-weight groups studied, and figs. 1 and 2 show the curves of groups A and D from the age of 5 that of 12 years. The total number of children in gated has already been given. In many cases records showed the weights and heights of child intervals of two or three years. All these figures been utilised for working out the means given.

TABLE IV—RELATION OF BIRTH WEIGHT TO SUBSEQUENT HEIGHT IN GIRLS

Age (years)	Group D : birth weight 9 lb. 9 oz. (4337 g.) or more		Group C : birth weight from 8 lb. 8 oz. (3856 g.) to 9 lb. 8 oz. (4309 g.)		Group B : birth weight from 7 lb. 2 oz. (3238 g.) to 7 lb. 6 oz. (3351 g.)		Group A : birth weight 5 lb. 8 oz. (2495 g.) or less	
	No. of children	Mean height (cm.)	No. of children	Mean height (cm.)	No. of children	Mean height (cm.)	No. of children	Mean height (cm.)
4½	..	..	25	106·1	15	104·1	6	106·2
5	23	108·6	126	108·6	63	106·3	50	104·2
5½	23	111·2	136	111·7	71	109·6	51	105·4
6	13	116·7	88	114·9	67	108·1	39	110·5
6½	14	116·8	54	116·3	58	115·6	33	113·6
7	12	121·6	55	120·0	55	116·2	34	114·8
7½	20	123·1	60	121·9	61	120·0	44	115·8
8	10	126·4	65	125·2	69	122·1	44	119·4
8½	14	126·2	61	127·5	62	125·7	40	123·8
9	15	130·4	63	130·1	60	127·7	47	124·9
9½	12	133·0	58	131·3	49	132·3	40	127·9
10	15	133·6	54	134·8	51	133·8	30	128·5
10½	10	136·6	59	136·6	33	138·2	34	133·0
11	11	140·9	53	141·9	29	138·3	27	134·5
11½	6	144·0	29	141·4	19	139·9	20	140·2
12	6	144·3	31	145·7	15	146·2	16	139·8
12½	4	154·1	18	147·7	11	146·3	19	145·3
13	5	147·8	10	150·9	7	150·0	8	146·0

It will be seen that, with a very occasional exc due to the fact that there were two few children in groups to make the mean figure reliable, there constant uniform gradation of weight from that children who at birth weighed 5 lb. 8 oz. or less to of the children who at birth weighed 9 lb. 9 oz. or At the age of 5 years, for instance, there was a di in boys of 2·4 kg. (5·3 lb.) between the two 2·3 kg. (5·1 lb.) at the age of 7 years ; 3·9 kg. (8 at the age of 9 years ; 7·1 kg. (15·6 lb.) at the 11 years ; and 2·9 kg. (6·4 lb.) at the age of 12 y In girls there was a difference of 2·7 kg. (5·9 lb.) at age of 5 years ; 5·1 kg. (11·2 lb.) at the age of 7 y 5 kg. (11 lb.) at the age of 9 years ; and 5·8 kg. (12 at the age of 11 years. The figures for the child groups B and C in almost all cases fell between means. In general the difference was greater for than for boys. The tables show that a girl aged 7 y from group A weighs the same as a girl aged 5 y from group D. A girl aged 10 years from group weighs the same as a girl aged 7½–8 years from gro There can therefore be no doubt that in these chil there was a definite and important connexion be weight at birth and weight in later childhood.

Table v, which is summarised in fig. 3, shows relation of birth weight to subsequent weight in a more striking manner. The table shows the range of variation in weight of children of the four birth-weight groups. The figures used for the "normal" weight and height are those given by Paterson (1947). They correspond extremely closely to those given by the school medical officer for London elementary schoolchildren (London County Council 1940).

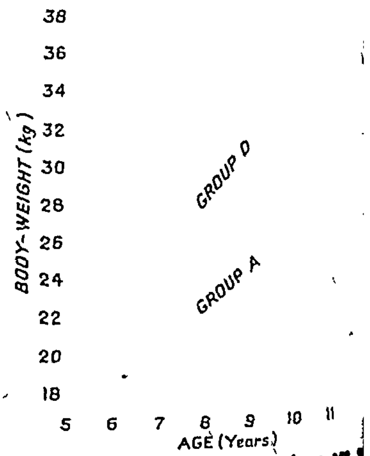


Fig. 1—Growth curves of boys from age 5 years to that of 12 years : group A, bir weight 5 lb. 8 oz. (2495 g.) or less ; gro D, birth weight 9 lb. 9 oz. (4337 g.) or mor

It will be seen that 9·5% of 232 children in group A and 59·2% of 120 children in group D were 10% or mor above the "normal" weight at the age of 5–5½ years the corresponding figures at the age of 7–7½ year were 10·4% and 48·0%. On the other hand, 28·9% o group A were 10% or more below the "normal" weight compared with 1·7% of group D. The corresponding figures for 9–9½ years were 41·4% and 7·8%, and for 11–11½ years 47·4% and 7·1%.

The table also shows a striking difference in th percentage of children of the four birth-weight group who were still further below the average weight—20 1% or more below the normal for the age. At the age o 7–7½ years 11·1% of 134 children in group A and 2 4% of 247 children in group B were 20·1% or more below the average weight, whereas none of the 341 children o

ADIOTHERAPY OF ACCESSIBLE GNANT TUMOURS BY ALTERNATING CHESS-BOARD METHOD

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uniform distribution of the administered dose ation throughout the treated volume of tissues is pted and professed aim in almost every method otherapy of malignant growths. The concept ial homogeneity dates from about 1904, when er suggested the increased target-skin distance ain a distribution in depth similar to that on face which was effective in dermatological con- treated with röntgen rays (Dessauer 1923). as an epoch of pioneering in radiotherapy, when introduced filtration by covering the patient sheet of aluminium, and when in 1905 Köhler rxheimer (quoted by Wetterer 1919), on the basis ir histological examination, stated "that no ative changes as an effect of röntgen irradiation be detected in tumours at a depth greater than from the surface, and that the review of the re did not show the existence at that time of ord of effect at a depth over 6–8 mm."

since Dessauer's enunciation of spatial homo- as the aim of proper deep X-ray therapy the le of uniform distribution of radiation has ccasionally been questioned (Holzknecht 1924, ian and Mayneord 1943).

concept of selective radiosensitivity of malignant g cells which permits the delivery of a "canceri- dose of radiation with avoidance of irreversible to normal structures seems the only relevant al reason for uniform distribution in planning ent.

attainment of high dose levels is still the main e in almost every method of treatment, and tention is paid to the preservation of connective-tissue structures, which is, however, as important as the delivery of an effective dose of radiation.

The effect of ionising radiation on malignant cells is not the whole story of the events leading to the disappearance of the tumour and eventual cure; many other factors come into play, of which the stroma reaction and the resistance of the host to the tumour are of great importance.

On the physical side the question of exact dose assessment necessitates the repetition, in the treated region of the body, of physical conditions corresponding to those *obtained in a laboratory phantom.*

Broadly speaking, attempts are being made with the present methods of treatment of a patient with a malignant tumour to obtain a uniform distribution of radiation throughout the volume of treated tissues, so as to be able, if it proves successful, to repeat the same type of treatment in another patient.

In practice, homogeneous distribution of denaturing radiation is attained only to some degree in deep X-ray therapy, whereas in interstitial radium therapy, which is successful in numerous cases, homogeneous distribution is never achieved.

A successful attempt to disprove that spatial homogeneity of radiation is essential for an effective treatment, and a new method which is a complete departure from all the existing methods in use in both fundamentals and technical details, are here described.

The principle of the method is that, with a lead chess-board sieve, portions of the tumour 1 cm. square are exposed to radiations, while other portions of similar area are protected so that important structures remain undamaged and can take part in repair. After a suitable period of treatment another chess-board sieve, in which the order of opaque and transparent areas is reversed, is used, and the previously untreated areas are exposed, while the already treated areas are protected and their recovery not hindered.

MATERIAL AND METHOD

Tumours of breast and skin and secondary glands of the neck were treated. Patients with very advanced inoperable tumours of breast in which only some palliative treatment could be given, or with tumours of skin which, because of their extent, situation, and infiltration of surrounding and underlying structures, or because of the general condition of the patient, was unsuitable for radical radiotherapy or surgery, were treated by the sieve method.

The radiation was delivered through a lead sieve with circular or square apertures 1 or 2 cm. in diameter. Ultimately a chess-board arrangement with alternate opaque and transparent squares was found most suitable (fig. 1).

The chess-board is applied tightly over the part to be treated, and the periphery of the lead mask is marked on the skin, as also are the centres of the apertures. This is most important to secure landmarks for appropriate exposure of parts which have to be irradiated and to shield the areas to be screened from the beam during treatments taking place over weeks.

In tumours of the skin always, and in breast tumours whenever possible, a specially moulded applicator is built for each case (fig. 2). A stent impression of the lesion is made in a plaster cast, over which a tightly fitting stent or black-tray dental-compound applicator is built in such a way as to be easily mounted over the part of the body, and fitting in such a way as not to allow even minimal shifts of the applicator which might allow the transposition of the transparent and opaque portions of the lead chess-board, which is recessed in the mould.

The radiation has to be delivered at right angles with the X-ray tube head applicator directed vertically. To

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that the growth curves of children who were small babies at birth are likely to be well below those of children who were large babies.

DISCUSSION

It is clear that in a considerable number of children there is a close relationship between weight at birth and subsequent physical development. This study, however, leaves many questions unanswered. An analysis of body build in various birth-weight groups is necessary, and this is now being carried out on the children whose records were used for this investigation.

It would be interesting to know what rôle, if any, maternal malnutrition had in the causation of prematurity in the children of the smallest birth-weight group. That malnutrition in pregnancy has an adverse effect on the birth weight has been shown in both man and animals. Smith (1947), for instance, showed that in the Netherlands during the German occupation from 1944 to 1945 there was a positive correlation between the nutritional status of the mother in the last three months of pregnancy and the weight of the fœtus at birth. Huggett (1946) reviewed the evidence for similar findings in animals. It would be of great interest if it could be shown whether there is any relationship between maternal nutrition, because of its effect on birth weight, and the subsequent physical development of the offspring. Wallace (1945) showed that fœtuses born of ill-nourished dams weighed less than half those of well-fed ones. Some tissues were more affected than others, nerve tissue competing for the available nutrients more effectively than bone, and bone more effectively than muscle or fat. Malnutrition of the dam altered the whole build of the fœtus ; the fœtus was not a mere miniature version of the larger fœtus of the same age. It seems likely, however, that maternal malnutrition is only one of many factors in the causation of prematurity in this country. As Dunham (1948) says, the cause of prematurity is in most cases unknown.

The suggestion made by Hess and Chamberlain (1927) that premature infants can be made to reach a normal weight by proper feeding is of great interest and needs to be confirmed. There is some experimental evidence that malnutrition in the early days of life may have a permanent effect on development. Hammond (1932) showed that in sheep after birth different parts of the body have different ages of optimal growth. Bone grows first, then muscle, then fat. If lambs are undernourished and are then given an optimum diet, the recuperative powers are limited mainly to those tissues growing mostly in the later period. McMeekan (1940) found the same in pigs. McMeekan and Hammond (1940) have shown that the effect on bodily proportion may be permanent. McCay et al. (1935) retarded the growth of rats by dietary insufficiency for long periods and then gave them an optimum diet. The rats did not catch up to the normal body proportions, and throughout their life (which was longer than that of the controls) they had a smaller body, smaller organs, and smaller bones than normal. The female rats fared worse than the male. Perhaps adequate correction of rickets and anæmia in premature infants would enable them to catch up to the normal weight and height ; but we have not found any positive or negative evidence on this point in published reports. If it were so, it would be of the greatest importance, since it would affect physical development throughout the whole of childhood.

The regular gradation of weight and height at all ages with rise of birth weight suggests that nutrition in infancy is probably not the factor responsible for these differences. It would be difficult to prove, for instance, that the greater weight at the age of 10 years of the 9 lb. baby than that of the 7 lb. baby was due to better nutrition of the former in infancy. Further studies are required in different areas, rural and urban, to determine whether these differences are general. The obtained in Sheffield certainly correspond with obtained by Illingworth (1939) in London children.

These questions need to be answered before one decide whether the commonly used developmental c of weight and height are really applicable to all chil or whether the additional factor of birth weight sh be taken into consideration. If the differences bet the weight and height of the children in this study not related to malnutrition of the babies of small weight, new charts should be constructed to m possible to assess the normality of development child in relation to his birth weight. Our figures based on far too few children for norms to be esta from them ; but, if the general differences in weight height are as large as we have found in Sheffield London, the factor of birth weight should clearly taken into account in the assessment of a child.

Unfortunately our records do not go far into cence. They give no indication of the onset of pu We feel that the changes associated with puberty the interpretation of the findings in the age-group particularly difficult. We cannot say whether or the differences in weight and height in children of diff birth weights will disappear at puberty.

SUMMARY

To investigate the relation of weight at birth subsequent physical development in later chil we studied the weights and heights at various ages 517 children who at birth weighed 5 lb. 8 oz. or 712 children who at birth weighed from 7 lb. 2 oz. 7 lb. 6 oz., 940 children who at birth weighed 8 lb. 8 oz. to 9 lb. 8 oz., and 257 children who at weighed 9 lb. 9 oz. or more.

At all ages the weight at birth bore a well-marked constant relationship to subsequent physical dev ment. In girls, for instance, there was a difference 11·2 lb. at the age of 7 years between the mean w of children who had weighed 9 lb. 9 oz. or more at and that of children who had weighed 5 lb. 8 oz. or There was a corresponding difference of 11 lb. at age of 9 years and 12·8 lb. at the age of 11 years. average girl aged 10 years who had weighed 5 lb. 8 or less at birth weighed the same as the girl aged 7 years who had weighed 9 lb. 9 oz. or more at At all ages there was a constant gradation in the weight of children of either sex according to birth w

A strikingly high proportion of children of the sm birth weight were far below the "normal" weig later childhood. At the age of 9–$9^1/_2$ years, for inst. 41·4% of the children were 10% or more below "normal" weight, compared with 7·8% of children the largest birth weight. The corresponding figures the age of 11–$11^1/_2$ years were 47·4% and 7·1%. the age of 9–$9^1/_2$ years 15·7% of 140 children of smallest birth weight were 20·1% or more below "normal" weight, compared with about 1% of children of the remaining birth-weight groups.

There were similar but less striking changes in t mean height of these children at all ages. The effect the birth weight on the weight/height ratio is exemplifi by the assessment of these children by the Wetzel gri and Tuxford index.

The possible rôle of nutritional factors is discus and the need for further investigation emphasised.

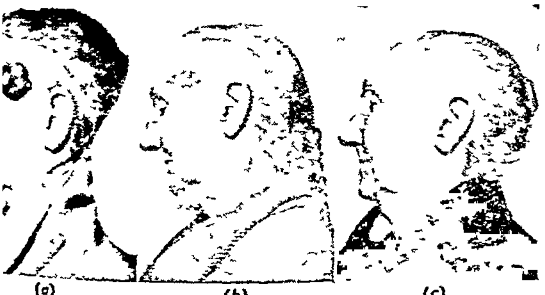
We wish to thank especially Dr. H. M. Cohen, scho medical officer for Sheffield, and Dr. A. Black, princip maternity and child-welfare officer, for their help, witho which this investigation would have been impossible. We also wish to thank Dr. Fraser Brockington, county medic officer of the West Riding County Council, and his staff, for granting access to their records.

References at foot of next page

. in diameter. 10 days after the end of treatment the ras healed, and except for one pimple of fibrotic tissue n. in diameter there was no sign of the previous lesion. ys after the end of treatment the skin on the left cheek eauricular region was smooth, supple, and normal-looking.

se 3.—A married woman, aged 78, had an ulcerated e of growth on her left temple 2·5 cm. in diameter. logical examination showed this to be a basal celled oma of the skin. The parenchyma formed solid cords, ng a distinct layer of columnar cells. The division-rate tumour was rather low, indicating slow growth.

alternating chess-board method was adopted, and treatbegan on Dec. 31, 1948, and ended on Jan. 31, 1949. 200 kV , 0·5 mm. Cu + 1 mm. Al filtration, H.V.L. 1 mm. Cu. 50 cm. . A 5 cm. circle applicator was used and held in position 'Bakelite' limitator fitted in the recess sleeve in which reviously used 7 cm. diameter lead chess-board used her cases was in direct touch with the lesion. The boards were changed weekly, and two courses of treat at weekly intervals were given through each chess. The total dosage was 4500 r to chess-board A and r to chess-board B. A week after the end of the treatment was an area of granulation 1·3 cm. in diameter. 35 after the end of treatment the skin was completely d. A section was taken from the centre of the treated where a pin-head-sized raised spot could be felt as an larity over an otherwise smooth and supple skin. The ogical report read: "No-tumour cells seen" (fig. 5). sections were taken also in this case.



(a) (b) (c)

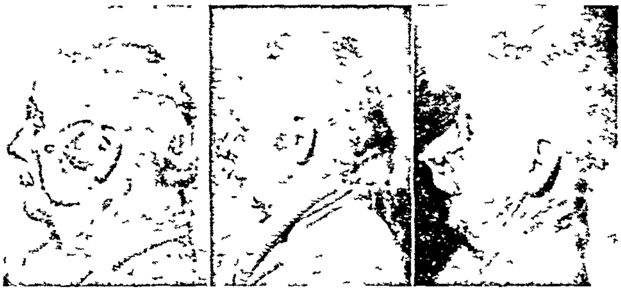
—Case 1: (a) before treatment; (b) at the end of treatment (c) 44 days after the end of treatment.

DISCUSSION

al risk of necrosis would have had to be faced in ing the lesion in case 1, and perhaps also in case 2, urrent methods, and an elaborate arrangement in r radium or X-ray technique would have been d for in an attempt to eradicate the tumour. In irst two cases X-ray treatment only on a protracted could have been used, a radium mould alone being itable because of the thickness of the tumour, an interstitial implant at the base of tumour could be contemplated because of the age and general ition of the patients. In case 3 a radium implant not warranted because of general condition, and only dium mould or routine X-ray treatment was the native to the new method adopted in this case.

ith the new method of treatment the reaction in ree cases was remarkably mild. On no occasion were s of disepithelisation larger than 1 cm. in diameter d. The marginal normal skin and the skin from h the tumour had shrunk away were healing during tment. The amount of residuum, which on histoal examination showed no evidence of viable malig cells, was very small. The cosmetic results in cases d 2 were excellent, and in case 3 just as good as d be expected from any other method.

he disappearance of the tumour coinciding with the of treatment, and the rapid resolution of the residual otic nodule at the site of the lesion in cases 1 and 2, e clinical evidence of the greater ability of the stroma ope with the tumour, and the better absorptive power he inflammatory cell infiltrate to cope with the islands ead cells and other debris.



(a) (b) (c)

Fig. 4.—Case 2: (a) before treatment; (b) at the end of treatment (c) 49 days after the end of treatment.

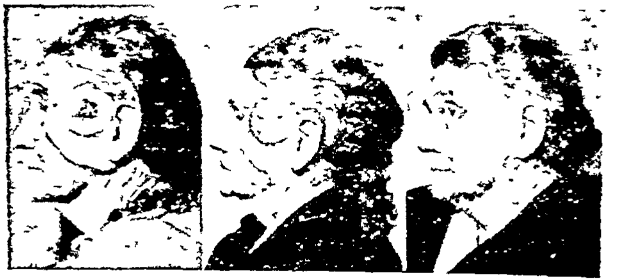
The period of observation after treatment has been very short; but, since the lesions are healed and the histological reports on sections taken at the end of treatment negative as regards viable malignant cells, it is thought that the immediate results are of some interest, and it is not necessary to wait five years to present the survival data of three octogenarians.

The ease with which the apparatus is set up and the availability of an applicator of the size required with a steady mounting were the determining factors in the choice of an X-ray beam generated at 200 kV 12 mA. The doses mentioned refer to 7 cm. and 5 cm. circular areas measured with full back scatter. In fact 20% less was delivered because of the size of the transparent squares. Direct dose-rate readings have proved this estimate to be on the conservative side.

Uniform distribution of radiation in the treated volume of tumour has not been used. In case 1 alternate parts of the tumour received 5000 r while adjoining alternate parts received 3500 r only; in case 2 7250 r was given to one group of squares, 3500 r to others; and in case 3 4500 r was given through chess-board A and 4750 r through chess-board B (the figures represent doses not corrected for size of area).

As stated before, the set-up of the stent or "black-tray" compound mask was such that shifts of the chess-boards in relation to the tumour were reduced to a minimum; but even with the greatest care some shifts are unavoidable, though it is unlikely that they exceeded 1 mm. on either side. However, there may have been a linear overlap, and small strips of tissue may have received the dose given through both chess-boards. This condition would be comparable to that which obtains with interstitial radium implants, where high-dose spots are unavoidable and not detrimental to the outcome of treatment.

The effect of the irradiation through the first series of squares was not confined to the irradiated areas, for the tumour was considerably reduced also in the untreated squares; hence it was unnecessary to give so large a dose to the second series as had been given to the first.



(a) (b) (c)

Fig. 5.—Case 3: (a) before treatment; (b) at the end of treatment; (c) 35 days after the end of treatment.

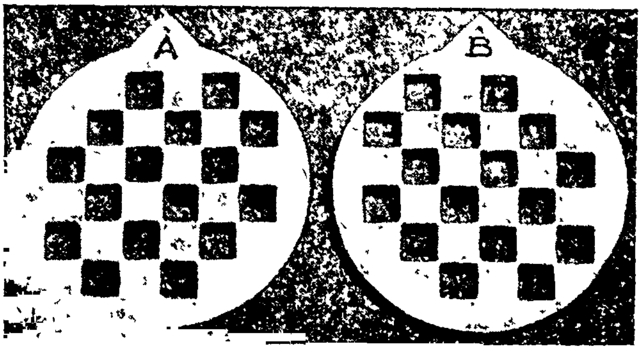


Fig. 1.—Lead chess-board panels. The order of transparent and opaque 1 cm. squares is reversed in the two panels.

avoid oblique penetration into areas beneath the opaque squares the lead chess-board must be in direct touch with the surface of the tumour. In the course of treatment, owing to shrinkage of the tumour, the recess sleeve in the stent mould into which the chess-board is slipped, has to be filed down from time to time.

The thickness of the lead, which is limited for practical considerations, permits 3% of the radiation to pass through on to the protected areas. To that amount of radiation received by the not directly irradiated areas has to be added about 3–5% of scatter radiation from the neighbouring exposed areas. This varies according to the size of the apertures and decreases towards the centre of the " opaque " squares.

The size of the squares has been chosen as not less than 1 cm. because of the results of experiments on the reciprocal vicinity effect of irradiated tissues (Jolles 1949a). This size offered also the best conditions for a histological study of connective-tissue reaction to radiation with the chess-board method (Jolles 1949b).

After a certain amount of radiation has been delivered through this chess-board, a second chess-board is used in which the order of the " transparent " and " opaque " squares is reversed, and radiation is given to sectors of tumours previously shielded. Further treatment may be given again through the first chess-board, and occasionally a fourth series, through the second chess-board, may be found advisable.

The irradiation was given daily for 5 or 6 days a week. The apparatus was set up always by the same people, and every precaution was taken to avoid minimal shifts.

A preliminary group of five cases of advanced carcinoma of the breast, which formed part of the material used for the study of connective-tissue reactions to radiation (Jolles 1949b), and four cases of secondary glands of neck served for orientation and paved the way to building the alternating chess-board technique described here. Three cases of epithelioma of skin treated with the chess-board technique are described in detail.

CASE-RECORDS

Case 1.—A married woman, aged 80, had had for twelve years a slowly growing proliferating ulcerated squamous-celled carcinoma on her left temple 5 × 4 × 2 cm. fixed to the underlying structures. Histological examination showed this to be a squamous-cell carcinoma of the skin. The parenchyma formed infiltrating cords of various thicknesses, the centres of which were undergoing differentiation, of which the degree and extent varied much in different regions. No lymph-nodes were present. The lesion was suitable for a radium mould plus interstitial radium implant at the base of the tumour, or protracted X-ray treatment.

The alternating chess-board technique was adopted and treatment commenced on Nov. 15, 1948. 200 kV 12 mA, 50 cm. F.S.D., 0·5 mm. Cu + 1·0 mm. Al filtration, 1·0 mm. Cu H.V.L., 39 r per min. were the physical factors. The sieve panel was 7 cm. in diameter. 5000 r was given through chess-board A in ten treatments in 11 days, with a 7 cm. diameter circle applicator. At the end of this series the tumour was half its former thickness (4·6 × 3·7 × 1 cm.). Sections were taken before the start of treatment and 2000 r and 4000 r had been delivered through the transp squares in chess-board A. Two days later series B was star 3500 r was given through chess-board B in fourteen ments in 18 days. Sections were taken from exposed protected areas after 2000 r and 3500 r had been given thro chess-board B. The lesion was now about a twentieth of former size.

Deep erythema was noted at the periphery of the area, and small islands of disepithelisation in the 16 days after the end of treatment a small residual nodule 1 cm. in diameter was all that remained of the lesion; 10 days later this was still smaller and a specimen was taken. The pathological report read: tumour cells seen. Fine fibrotic structure." 44 day the end of treatment the skin was smooth, shiny in and with no fibrotic residuum (fig. 3).

The patient subsequently developed a penicillin " with oozing spots on the face, eyelids, auricle, and neck, this soon cleared, and she is now well, with a good no sign of the previous lesion.

Case 2.—A married woman, aged 81, had had rad treatment to a spot on the right cheek when at the age of (32 years ago), and again 15 years ago to a recurrence, 6 years ago she had had a radium capsule applied to a fur recurrence. For four years she had had an ulcer on the side of her face.

Lesion I.—There was an ulcerating proliferating gro on the right cheek, invading the right inner canthus, destro the right side of the nose, invading the cartilage deeply, extending on to the left side of the bridge of the nose. whole thickness of the skin on the right cheek and the eyelid was involved. The lesion measured 6 × 5 This lesion on the right cheek, nose, and eye was palliative lines; 1800 r was given—three treatments hours—and the whole area was cleared by diathermy exci

Lesion II was an ulcerating growth in the left preauricu region, measuring 5·6 × 3·8 × 2 cm.; it was not fix and no glands were involved (fig. 4). Histological examina showed this to be squamous-cell carcinoma of the sk a diffuse anaplastic growth with a very low degree differentiation.

Treatment of this lesion with alternating chess-boards w started on Dec. 2, 1948, and finished on Jan. 13, 1949. 600 was given through chess-board A in twelve treatments 15 days. This was followed by 3500 r through chess-board in fourteen treatments in 18 days. A further 1250 r was giv through chess-board A in five treatments in 5 days. Th total irradiation was 7250 r through chess-board A an 3500 r through chess-board B in treatments spread ov 43 days.

Sections were taken before treatment and from expo and protected areas after 2000 r and 5000 r had been giv through chess-board A. Subsequently sections were taken fro adjoining areas after 2000 r and 3500 r had been deliv through chess-board B and finally after the end of treatm

The regression of the tumour was rapid. The skin reactio was very mild. The areas of disepithelisation did not exce

Fig. 2.—Stent mould fitting tightly with lead sieve in position in th recess sleeve for the X-ray tube applicator.

from sources other than mammalian liver. The ¢, nevertheless, will continue meanwhile to provide nain supply of extracts for general use. It therefore s opportune to record the results of a clinical trial ı extract of whale liver which, given by mouth, ars to be highly effective in the treatment of cious anæmia.

is extract, supplied by United Whalers Ltd., was ıred by a simple process of water extraction and tion. The resultant aqueous extract was a brown us liquid, and it was estimated that 1 oz. of extract lerived from 25 oz. of whole liver.

ne cases of typical addisonian pernicious anæmia been treated with this oral preparation, and the ts are shown in the accompanying table. The trials carried out according to the method prescribed for :al testing of liver extracts by the Association of cal Pathologists of Great Britain in order to obtain ıgle maximum reticulocyte response (Whitby and on 1946). That is to say, suitable cases fulfilling all ıostic criteria were observed for some days before commencement of the test to exclude spontaneous ssion. Sources of hæmatinic principle, such as liver kidneys, were barred from the diet. The liver extract then given in uniform daily amounts in divided doses nouth. Reticulocyte-counts were done daily until eak of the response was clearly passed. Administra- of the extract was thereafter continued in the same amounts, and red-cell and hæmoglobin estimations made at weekly intervals. These observations on ncrease of red cells in response to treatment provided tional information as to the potency of the extract. expected increase in the number of red cells in the two weeks of treatment was calculated by the ula of Della Vida (1942).

ıses 1 and 2 were given a total daily dose of 3 oz. by th, and both responded satisfactorily. In cases 3, 4, ıd 6 the daily dose was reduced to $^1/_2$ oz. (equivalent $2^1/_2$ oz. of whole liver), and good responses were ıned in all but case 5, where the increases in red cells reticulocytes were slightly below the expected figures. 3 responded well in spite of a concurrent severe ary infection, but hæmoglobinisation was delayed ıg to iron deficiency. Cases 7, 8, and 9 were given z. of the extract daily (equivalent to $6^1/_4$ oz. of whole), and satisfactory results were obtained in all three s even with this small dosage. The reticulocyte onse in six of the nine cases reached or exceeded the cted levels calculated by the method of Bethell and lhamer (1933). Of the three patients (cases 1, 5, 6), with a suboptimal reticulocytosis two (cases 1 6) showed a satisfactory increase in red cells after weeks' treatment. This conforms to our experience the rise in erythrocyte-count is often a more satis- ory guide than the maximal reticulocyte response in ssing the effect of liver therapy in pernicious anæmia, cially where small repeated doses are administered. ow-up results are given for cases 8 and 9, who were ıtained on the same dose, showing that complete oration of blood levels could be obtained. In addition the initial diagnostic bone-marrow examinations, nal puncture was repeated about the fourteenth day reatment, and complete reversion to normoblastic hropoiesis was found in all cases.

hese results confirm the observation of Aylward et al. 41) that whale liver contains active hæmopoietic or. Satisfactory and complete hæmatological remis- has been obtained here with daily amounts as small $/_4$ oz. (8 g.) of aqueous extract (equivalent to 200 g. whole whale liver). This is the same as the accepted imal therapeutic dose of whole bovine liver, and it refore seems that whale liver is at least an equally ent source of hæmopoietic factor. The possibility might be considered of using whale liver for the preparation of pharmaceutical liver extracts.

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THE EOSINOPHIL LEUCOCYTE, EOSINOPHILIA, AND ALLERGY

A HYPOTHESIS

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A GENERALLY acceptable explanation of the mechanism of eosinophilia and of the function of the eosinophil leucocyte has yet to be advanced. Perhaps the most widely held view is that the presence of a foreign protein is the specific factor causing eosinophilia, and a rôle of detoxication of these proteins has been attributed to the eosinophil.

EOSINOPHILS IN BLOOD AND TISSUES

Modern textbooks state that eosinophils are more abundant in the tissues than in the blood (Wintrobe 1946, Cowdry 1944, Alexander 1941, Smith and Copenhaver 1948), being found especially in the epithelial linings of the respiratory and gastro-intestinal tracts and in the fluids beneath them. Since the bone-marrow is the source of all eosinophils, the bone-marrow picture should indicate the degree of body eosinophilia as a whole more reliably than does the blood picture. A tissue eosinophilia is often found with little or no blood eosinophilia, but in allergic conditions the bone-marrow picture typically shows increased production of eosinophils (Urbach and Gottlieb 1946).

EOSINOPHILIA AND THE ALLERGIC RESPONSE

There is a considerable amount of evidence that eosinophilia is not a reaction to foreign protein per se but is part of an allergic response which develops only after a second introduction of that foreign protein, and then only if a certain latent period elapses between the first and subsequent introductions. The latent period is the same for both the allergic reaction and eosinophilia.

This has been demonstrated in experiments on guinea-pigs by Campbell and others (1935) and Biggart (1932). Further evidence is afforded by Knott and Pearson (1934), who injected appropriate proteins into sensitised patients and found eosinophilia at the site of reaction. Bezançon and Bernard (1930), reviewing the French published work, concluded that in allergic conditions a local eosinophilia is present at the site of reaction, wherever that is. Many other workers—e.g., Rossle (1914), Berger and Lang (1931), and Schlecht and Schwenker (1912)—agree and local eosinophilia is now accepted as part of the histopathology of allergy (Tuft 1938, Urbach and Gottlieb 1946).

The rôle of histamine in the production of the symptoms of allergy is still disputed, but there seems to be little doubt that its part is considerable, even though it may be only one of several toxic substances released in the allergic reaction. Code (1937, 1939) found that in laboratory animals and in man the eosinophil was the richest source of blood-histamine—in fact the only source positively found.

Eosinophilia can no longer be regarded as merely an incidental accompaniment of the allergic reaction, and I suggest that the eosinophil is an important factor in *causing* the allergic response. The following facts support this suggestion:

(1) Human allergic reactions occur usually at the chief sites of eosinophil concentration ("shock organs").

A chain of events is started in the treated areas, and this stretches out beyond the boundaries of the *irradiated sectors* of tumour. The effective doses required in the chess-board method are of a different order from those in orthodox methods.

Whereas up to now the whole problem of dosage in tumours and of methods of irradiation pivoted on the so-called differential radiosensitivity of the tumour cells, and the skin and normal structures were the main criteria regarding the load to which they could be subjected, with the alternating chess-board technique *the resistance to radiation of the connective-tissue* structures and their recovery rhythm are considered of paramount importance.

The time factor, which in the orthodox methods of treatment is related to the cell-life cycle and to the attainment of the highest tolerable doses with the avoidance of damage to the skin, in the technique here described assumes a new complexion. It is the recovery period of connective-tissue fibres, fibroblasts, &c., that should be given prime consideration in the distribution of the dose of X rays.

The length of treatment time and the changeover from one chess-board series to another were influenced by data on the recovery period of fibroblasts irradiated in vitro (Lasnitzki 1943, Spear 1946) and the spacing of treatments by the Stockholm method of radium treatment in gynæcological cancer.

The effective doses were considerably smaller than those customarily used in the treatment of epitheliomas. This was the object of the method.

The histological reports on the biopsy material (Dr. P. C. Koller, of the Chester Beatty Research Institute) show that the sieve method enables one to analyse the reactions of the various tissue elements separately and to assess their importance in the radiotherapy of tumours. A fibrous differentiation of the connective-tissue cells is induced by radiation which, if it takes place before 2000–2500 r is delivered to the tumour and tumour bed, can hinder the full development of an inflammatory response necessary for the destruction of tumour and for *its supersession by granulation tissue.* The investigation clearly shows also that not only does "stroma" reaction facilitate the destruction of tumours but also that on this reaction rests the success or failure of irradiation.

The alternating chess-board method is being applied, when technically possible, in advanced and difficult cases of epithelioma, and it is not suggested that it should take the place of other more expeditious techniques. It seems to be, however, an approach by which the indirect radiation effect and the stromal effect are greatly enhanced; it might also perhaps provide a new approach to the treatment of radioresistant connective-tissue tumours.

SUMMARY

A new method of treatment of accessible tumours which is a complete departure from all the existing methods in use in both fundamentals and technical details is described.

The principle of the method is that, with a lead chess-board sieve, portions of the tumour 1 cm. square are exposed to radiation while other portions of similar area are protected so that important structures remain undamaged and can contribute to repair. *After a suitable* period of treatment another chess-board sieve, in which the order of opaque and transparent areas is reversed, is used, and the previously untreated areas are exposed while the already treated areas are protected and their recovery not hindered.

Three cases treated with the sieve method are described.

The treatment is individualised (not standardised) and controlled by histological study of biopsy material taken at various intervals of time from adjoining areas, and the dose of radiation required for the disappearance of the tumour, which is ve [illegible] those used i methods in which [illegible] both malig and normal tissue alike. The risk of necrosis is lesse to a great extent, and the indirect effect of radiatio utilised. The reactions are mild, and healing t place during treatment.

The biological implications are emphasised, and main criteria regarding the fractionation are discusse

I wish to thank Prof. Sidney Russ, D.SC., for having me on the "sieve" trail some ten years ago, when I working under his direction at the Barnato-Joel Laborato Middlesex Hospital; Prof. W. V. Mayneord, D.SC., arranging for the direct dose-rate readings to be underta in Northampton by Miss N. L. Gage, of the physics dep ment, Royal Cancer Hospital (Free); Mr. E. J. Par research technician in this department, for contrib materially to the work and for the photographs; and their willing help, the staff of the department. The w was made possible by a grant for expenses from the Bri Empire Cancer Campaign.

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HÆMOPOIETIC ACTIVITY OF WHALE-LIVER EXTRACT

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THERE has been much discussion recently about th potency of British commercial liver extracts, an Wilkinson (1949) has stated that the use of so-calle "pharmaceutical livers" has led to a deterioration i the quality of the extracts now being produced. Corre spondence in THE LANCET has shown that this stateme has been rebutted by some and supported by others, bu it is clear that many doctors are dissatisfied with prese day extracts. It seems likely that, before long, activ and easily standardised substances for the treatment o pernicious anæmia will be obtained on a commerci

HÆMOPOIETIC ACTIVITY OF WHALE-LIVER EXTRACT

Total daily dose ..		3 oz.		½ oz.				¼ oz.		
Case no.		1	2	3*	4	5	6	7	8	9
Sex and age (yr.) ..		M 48	F 55	F 49	F 57	M 50	F 58	M 61	F 72	F 7[illegible]
Hæmoglobin (%)	*Day* 1st	38	50	38	40	60	66	40	50	[illegible]
	14th	56	70	60	60	74	83	54	68	[illegible]
	21st	68	80	65	..	..	85	69	79	[illegible]
	28th	88	84	66	..	..	..	..	88	[illegible]
	35th	..	..	..	..	..	..	..	94	100
Red cells (millions per c.mm.)	*Day* 1st	1·71	2·50	1·62	1·51	2·21	2·59	1·65	2·07	[illegible]
	14th	2·98	3·51	2·84	2·76	3·06	3·63	2·79	3·21	[illegible]
	21st	3·48	4·01	3·15	..	..	3·64	3·12	3·52	[illegible]
	28th	4·31	4·14	3·59	..	..	..	..	4·13	[illegible]
	35th	..	..	..	..	..	..	..	4·50	[illegible]
Reticulocytes (%)	Max.	12	14	22	21	6	4	18	12	19
	Day	4th	7th	7th	8th	6th	5th	7th	6th	7th
Average weekly rise in number of red *cells in first two* weeks (millions per c.mm)		0·63	0·5	0·61	0·62	0·42	0·51	0·57	0·57	0·51
Expected weekly rise according to Della Vida's (1942) formula		0·57	0·39	0·58	0·61	0·46	0·38	0·58	0·49	0·33

*Responded in spite of severe urinary infection. Delayed hæmo-globin rise due to iron deficiency.

and size of reaction must be fulfilled, and in the of harmful antigens the mechanism is to some extent beneficial—i.e., rapid and direct access of antibodies ough not in the case of harmless antigen such as n, to which only specifically allergic patients produce bodies.

wish to thank my teachers at the London Hospital for interest and encouragement.

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ONGENITAL HYDRONEPHROSIS AND DRO-URETER WITH CONTRALATERAL PAIN

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T is widely recognised that pain caused by a lesion in kidney or ureter may be felt by the patient not on side of the affected organ but on the opposite side. is also common knowledge that the typical pain of al colic often passes from the loin to the groin, the ernal genitals, or the upper thigh. But it is not so erally realised that pain of ureteric origin may be erred more widely—e.g., to the anterior, lateral, and terior aspects of the thigh.

etterman[1] described a case in which obstruction the right pelvic ureter in a woman caused pain in the ht lumbar region, the back of the right thigh, and the ht heel. That the pain was referred from the ureter s proved by catheterising and distending the right ter, which manœuvre reproduced the pain.

Ockerblad and Carlson,[2] using an electric stimulus, pped out the distribution of pain referred from the al pelvis and ureter and confirmed that pain from ureter may be referred as far as the heel or toes on same side.

Consideration of the segmental nerve-supply of the eter allows us to comprehend even these unusual dis-butions of pain referred from it. It is not so easy, wever, to understand why reno-ureteric pain should metimes be referred to the opposite side of the body. deed some workers deny that the phenomenon occurs. The following case may be of interest because of certain usual features.

CASE-RECORD

A well-nourished intelligent boy, aged 16, was first seen by us in the outpatient department on March 9, 1948. He complained of an ache in the left loin, passing at times round to the left groin.

At the age of 3 years he had been investigated at another hospital for hæmaturia, and acute nephritis had been diagnosed. He had had no pain until he was 14 years old, when he had begun to note intermittent aching in both loins. The attacks of pain had been variable, lasting sometimes an hour and sometimes a day.

In August, 1947, the patient had been in another hospital with a septic foot. While there he had had an attack of hæmaturia which had lasted three days. It is not known whether he was then being treated with sulphonamides or not.

On Feb. 29, 1948, nine days before we first saw him, he had had hæmaturia which had lasted a day. There was no blood in the urine when it was examined by us.

An excretion pyelogram on March 9, 1948, showed no renal calculi. The left pelvis and ureter appeared normal. There was well-marked right-sided hydronephrosis and hydro-ureter. Both kidneys secreted and concentrated the dye well at five minutes and during the following thirty minutes.

The patient was placed on the waiting-list for admission, but on March 22, 1948, he was admitted as an emergency with severe pain. He said that on March 10, 1948, in addition to the pain in his left loin he had begun to get severe pains "in the left hip-joint" which would last ten minutes and had "paralysed" his left lower limb. These attacks of pain had been associated with nausea and occasional shivering.

On examination the patient was in obvious pain. His left hip was held slightly flexed, and any attempt at active movement—e.g., turning over in bed—increased the pain. He felt "a grating in the joint." Gentle passive movement caused no pain until the limits of the normal range were approached. His temperature was normal. Radiography of the hip-joints showed no abnormality. Examination of a mid-stream specimen of urine showed no pus cells and no organisms. There was slight tenderness on pressure in the right loin. Pressure in the left loin caused the patient to exclaim with pain. The pain he felt, however, was not in the loin but a sharp increase of pain in the left hip. This strange physical sign was elicited each day until his operation on March 30, 1948.

Operation.—Under general anæsthesia the lower right ureter was explored. It was found to be dilated up to a point about 1 inch from the bladder, this lowest inch being apparently of normal size. A right side-to-side uretero-cystostomy was done by Mr. Terence Millin. On regaining consciousness after the anæsthetic the patient said that the pain in the left hip had gone. Since the operation the pain has not recurred and the patient has been free from symptoms.

DISCUSSION

The cause of the obstruction was apparently an achalasia of the lower end of the right ureter. Until the age of 14 there had been no pain. Pain was latterly referred to the left side of the body and pressure in the left loin caused pain in the left hip. Pressure in the right loin did not. The pain was promptly and completely relieved by anastomosing the right ureter above the obstruction to the bladder.

Hæmaturia was never observed by us. If hæmaturia indeed occurred on the three occasions mentioned by the patient it may possibly have been caused by urinary infection. Examination of the urine on March 23, 1948, showed no pus cells or organisms. The pain on admission was therefore not due to urinary infection.

Since the function of the right kidney was good, it cannot be suggested that the left-sided pain was due to tension consequent on a compensatory overworking of the left kidney. The clinical findings and the immediate relief of the symptoms by operation make it certain that the pains in the left loin and left hip were referred from the right ureter.

My thanks are due to Mr. Terence Millin for permission to publish the notes on this case and for much help and encouragement.

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[1] Fetterman, F. S. *Amer. J. Obst. Gynec.* 1932, 23, 259.
[2] Ockerblad, N. F., Carlson, H. E. *J. Urol.* 1938, 39, 745.

(2) Allergic manifestations at these sites and elsewhere are accompanied by an eosinophilia, either local, general, or both (Tuft 1938, Urbach and Gottlieb 1946).

(3) Eosinophilia and the allergic reaction produced experimentally develop after the same interval of time.

(4) Allergic patients' blood releases histamine, in vitro, in the presence of specific antibody and antigen (Katz and Cohen 1941); hence, in the light of Codo's (1937, 1939) experiments, eosinophils release their histamine.

The importance of the eosinophil is indicated by the work of Mayer and Moncorps (1926), who found that injection of methyl-alcoholic extracts of spleen produced a definite hypo-eosinophilia, which was of therapeutic value in various skin diseases and in the prevention of anaphylactic reactions.

MECHANISM OF EOSINOPHILIA

If, then, as the experiments quoted above seem to indicate, foreign protein per se is not the specific factor causing eosinophilia, what is? Some factor or substance in the allergic process other than the antigen must be the chemotactic and stimulating agent.

I suggest that antibody constitutes such an agent—i.e., antibody attracts eosinophils chemotactically, and increased circulating antibody stimulates production of eosinophils. Bunting (1932) stated that the products of destruction of lymphocytes are specifically chemotactic for eosinophils, and Ehrich and Harris (1942), Kass (1945), and other workers claimed to have shown that lymphocytes contain antibodies.

Eosinophilia is evoked only by repeated injections of a specific protein. This points to the operation of a specific factor. It is difficult to attribute this specificity to the bone-marrow or to the individual eosinophil cells, especially since eosinophilia will occur with any foreign protein, provided repeated injections of the same protein are given. But we do know that antibodies and antibody-producing tissue possess the property of specificity. A second injection, after the latent period, stimulates an increased production of antibodies and also produces a well-marked eosinophilia.

Ling (1925) and Biggart (1932) reported a slight blood eosinophilia after a single injection of foreign protein, but this rise was not comparable with that obtained after a second injection. The work done on primary and secondary responses of antibody-producing tissue indicates that non-particulate antigens (foreign-protein solutions) will often produce little or no antibody response to a first injection but produce a well-marked response to a second injection. Though a first injection of particulate antigens (bacterial suspensions) produces more antibodies, the difference between primary and secondary responses is just as well marked (Topley and Wilson 1946). It is noteworthy that antibacterial immunisation is always followed by an eosinophilia (Hajós 1928, Whitby and Britton 1946).

Again, non-specific stimulation of specific antibodies seems to occur ("anamnestic reaction") but is not comparable with specific stimulation. The same is true of eosinophilia (Biggart 1932).

The constantly found postinfective or postfebrile eosinophilia could be correlated with the steady rise to its maximum of the antibody titre during the recovery and convalescent stages. The antibody titre of patients with intestinal parasites is usually very high (Urbach and Gottlieb 1946), and such patients usually show a well-marked eosinophilia.

It has been shown by cutaneous tests (Hill 1942) that infants produce antibodies after the ingestion of a new protein. The same has been demonstrated in guineapigs (Hartley 1942). The antibody titre gradually diminishes in the guineapig after protracted administration, and the same process is shown in the infant by the disappearance of the positive cutaneous test. Berger (1916) found that, when a new protein is into an infant's diet, the number of eosinophils blood is increased 9–12 days after ingestion and gradually to normal or nearly so.

The eosinophil concentration found in weal fluid, marked in allergic than in non-allergic people (K Pearson 1934), may be due to selective chemotaxis eosinophils exerted by the serum-antibody in the fluid. Allergic patients will have more antibodies their blood.

The eosinophil response in bacterial disease is by the neutrophilia which is usually present, for been shown that in almost all conditions neutrophilia the eosinophils are diminished or (Simon's septic factor). This predominance of phils in septic conditions is well illustrated by observation that, when a hydatid cyst becomes neutrophilia takes the place of eosinophilia. Eosinoph is found in many syphilitics (Whitby and Britton 19 and is fairly common in pulmonary tuberculosis 1940, Whitby and Britton 1946) and more so in tub culosis of lymph-nodes (Wintrobe 1946).

When an artificial pneumothorax is induced in p monary tuberculosis it is followed by an eosinoph rich pleural effusion, and within five hours there is increased blood eosinophilia. This is characteristic tuberculosis and not due simply to the pneumothor (Piney 1939). If the eosinophilia does not devel the outlook is usually bad, and the more intense eosinophilia the better the prognosis (Ponticaccia 192 This clinical observation can be explained by equati eosinophilia with antibody-production.

The eosinophilia found in early Hodgkin's d more constant in the tissues than in the blood, may b explained by the disintegration of the lymphocytes i the glands, with the release of their contained antibodies

In an attempt to show that eosinophil chemotaxi would occur to antibody alone, I injected a norma healthy medical student subcutaneously with huma immune globulin (Lederle) in one arm and the foreign protein solution in the other. Biopsies of the site eighteen hours later showed a slight tissue eosinophili at the site of injection of human antibodies but non at the site of injection of foreign protein. The limitation of this single experiment are obvious, but the result i suggestive.

FUNCTION OF EOSINOPHIL LEUCOCYTE

It is possible to combine the ideas so far considered to provide a concept of at least part of the function that the eosinophil may perform in the human body.

Let us visualise the possible mechanism. The body has been sensitised, and the next contact with the antigen produces antibodies. These antibodies become distributed in blood and tissue fluids, and (hypothetically) eosinophils become approximated to antibody by chemotaxis, and their production stimulated. Antigen-antibody reactions, with breakdown of eosinophils, will release their histamine at the site of antigen invasion. Fluid from the blood exudes into the tissues, bringing more antibodies and therefore more eosinophils. This process will continue, and the capillaries will be rendered permeable to antibodies by histamine, until all the antigen has been neutralised.

This mechanism, I suggest, is a physiological defence mechanism for neutralising harmful antigens in the body tissues. If the reaction occurs in the blood-stream, histamine is quickly destroyed in the blood (Topley and Wilson 1946) and no symptoms may result, though there may be œdema and albuminuria (acute nephritis). Such cases would show hypo-eosinophilia, since theoretically eosinophils are broken down.

That clinical allergic manifestations may result from this mechanism is obvious, but certain conditions of

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Reviews of Books

Anévrysmes artériels et fistules artério-veineuses

René Leriche, professor at the Collége de France. Paris: Masson. 1949. Pp. 314. Fr. 900.

One of the conditions governing the office of professor of surgery at the Collége de France is that he must publish the course of lectures which he delivers annually. The present incumbent being Professor Leriche, his colleagues can anticipate with pleasure the monographs in which he regularly assembles his views on diverse subjects, written in the style which is his own and with the physiological outlook which has always been the feature of his major contributions to surgical literature.

This volume contains, with some additions, the lectures delivered in 1945 and 1946. As is usual in French monographs, the themes are built upon copious case-notes. Leriche's views on the operative treatment of arteriovenous aneurysms differ from those ultimately adopted by British and American surgeons. In this country and America, the operation of quadruple ligature and excision became almost the standard procedure; but Leriche holds strongly that every effort should be made to restore the continuity of the artery involved, and if possible to restore continuity of the vein—the latter a step which has been advocated by Paterson Ross. To this end he describes a number of ingenious procedures, which appear to have had immediate success; and he advocates a preliminary sympathectomy.

In the section on arterial aneurysms he insists on preliminary arteriography. He advises preliminary interruption of the sympathetic chain as a valuable immediate safeguard against nutritional changes, but prefers repeated blocking with procaine except when the aneurysm is at a bifurcation, when he regards operative sympathetcomy as essential. His preference is for operative methods which restore arterial continuity, and his case-reports contain examples of all the varied procedures available. British surgeons would endorse Leriche's general recommendations, with the possible exception of routine arteriography. They include a bloodless field, incisions so designed as where possible to leave a covering of muscle over the repair, and the routine use of heparin after reparative operations.

But the value of the work is twofold. Not only is there a wealth of experience clearly presented, with its difficulties solved: there are also—as one would expect—many arresting indications of doubt as to the inviolability of orthodox pathological explanations of phenomena about which so much has been written that one might have thought the field barren. But that is Leriche: and so to appreciate it properly the monograph must be read in full.

The Driving Forces of Human Nature

And their adjustment. Dom Thomas Verner Moore, ph.d., m.d., monk of the Order of St. Benedict; professor of psychology and psychiatry, Catholic University of America, Washington, D.C. London: Heinemann Medical Books. 1948. Pp. 456. 35*s*.

This erudite "introduction" to the psychology and psychopathology of emotional behaviour and volitional control might be more aptly described as a conducted tour. The author, an exponent of Roman Catholic philosophy, ranges over academic and clinical psychology and psychiatry, and achieves the rare feat of presenting a classification not based merely on symptoms. He is lucid, readable, and thorough in the things he covers, but there are notable omissions, and he does not inquire deeply into origins. A reader who knows the main tenets of Roman Catholicism will have no surprise in store. He will expect Professor Moore to dismiss psycho-analysis by friendly intellectual argument, which he duly does; and the gap this leaves is inevitably filled with an intellectualised concept of volition.

Despite a great number of detailed case-histories the book is in parts remote from clinical reality, especially in references to children—who are described as scheming little beggars from their earliest infancy. Professor Moore is interested in a phenomenon which he moral dullness, and which he links closely with intellectual defect. Not unexpectedly he minimises importance of sexuality as a driving force, and he asserts that sexual difficulties in the strict sense do exist in childhood except in a few exceptional cases mistreatment. Neurotic children, he holds, must made to learn by experience, and in a rather old-fashioned way too.

Readers in full religious accord with the author may share his preoccupation with making the maladjusted (and therefore bad) patient good. Others may feel this begs the question of causation of psychic difficulties—in other words that this conducted tour merely leads back to its starting-point in religious conviction of a particular type. Meanwhile this work which has great charm, may be recommended to the experienced reader in search of mental stimulation, but not to the beginner.

Zinc Ions in Ear, Nose, and Throat Work

A. R. Friel, m.d. Dubl., f.r.c.s.i. Bristol: John *Wright & Sons. 1948. Pp. 60. 5s. 6d.*

The scope of this specialised form of treatment as it can be applied in diseases of the upper respiratory tract is fully covered. Whether it is quite as efficacious as Dr. Friel suggests in the conditions for which he advises it is perhaps doubtful; but every practising ear, nose, and throat surgeon should be familiar with its possibilities and technique, and will become so by reading this well-written illustrated manual.

Exploration radiologique de l'appareil urinaire inférieur

(*vessie–urètre–prostate*) B. Fey; F. Stobbaerts; P. Truchot; G. Wolfromm. Paris: Masson. 1949. Pp. 291. Fr. 2500.

This French work is the most complete we have seen on radiological investigation of the lower urinary tract. There are nearly 300 plates illustrating every aspect of vesical and urethral pathology. The flocculation cystographic technique of Stobbaerts is particularly well illustrated.

Das biologische Weltbild

Vol. i: Die Stellung des Lebens in Natur und Wissenschaft. Dr. Ludwig von Bertalanffy, professor in the University of Vienna. Berne: Francke. 1949. Pp. 202. Sw. fr. 11.

Professor von Bertalanffy is already well known in this country as a theoretical biologist, although only one of his writings—*Modern Theories of Development*, translated in collaboration with Dr. J. H. Woodger—is at present available in English. The present work, the first of two volumes, is a general summary of the author's thought over the past twenty years. The central theme, to which he provides a great variety of illuminating glosses, is that organisation is the central problem of biology, a concept duly purged of the *mystique* with which so many writers have surrounded the idea of "wholeness." The organisation so conceived is a dynamic one, endowed with the property of self-regulation or active self-maintenance. Organismic biology has a conceptual equipment of its own and is not to be thought of as a subdepartment of physics. No-one qualified to judge will dispute von Bertalanffy's central ideas, which are now widely accepted, thanks in some degree to his own advocacy. In detailed argument there is more to take exception to, and some of the technical matter is not fully up to date. Nevertheless, this is a book which never fails to command respect.

Cystoscopy and Urography (3rd ed. Bristol: John Wright & Sons. 1949. Pp. 306. 63*s*.).—Mr. J. B. Macalpine's *Cystoscopy* has established itself as one of the standard urological textbooks in the English language. The new edition has been largely rewritten and greatly expanded, and now includes several chapters devoted to urographic and urological diagnosis. One has nothing but praise for this work, and every surgeon practising urology should have it on his bookshelves.

THE LANCET

LONDON: SATURDAY, OCT. 1, 1949

Midwife and/or Doctor

f the best possible maternity service is to be ded under the National Health Service, the al practitioner, the midwife, the antenatal clinic, the pathologist, as well as the hospital and the alist services, all have to play a part as members team."[1] At present the team spirit is not ally conspicuous; which, as Sir WILLIAM ATT[2] suggests, is perhaps not surprising in a e without unified control. When the National h Service Bill was in the committee stage the l College of Obstetricians and Gynæcologists cated a single controlling body; but the Act es midwifery between three authorities: the tal and consultant service comes under the nal hospital boards or the boards of governors of ing hospitals; general practitioners work in con- with the local executive council; and domiciliary ives are employed by the local authorities. It rd indeed to develop team-spirit in such a diffuse isation. Unfortunately it seems that the reverse ppening—for reasons that have divided pro- nal opinion sharply and therefore deserve to t out at some length.

en the service was originally planned the idea that a midwife should deliver all normal cases, that a general-practitioner obstetrician (G.P.O.) d provide "maternity medical services"—i.e., two antenatal and one postnatal examinations, the midwife advice when needed, and undertake abnormal confinement. For these duties the was to receive a fee of 7 guineas, whether he ded the confinement or not. There was never question of providing a doctor to undertake the nement except where there was a medical reason; nidwives and doctors agreed that the doctor on n the midwife might call for medical aid should the chance of seeing the patient in advance. ualify for the local panel of G.P.O.S, practitioners to produce evidence of special obstetric experi- ; and under this arrangement it would have impossible for a newly qualified doctor without raduate obstetric training to deliver a mother. r pressure from the profession, however, the ations of the health service were amended to every doctor to deliver patients who are on wn list, whether he has special experience in ifery or not. Thus general practitioners are of two s: (1) G.P.O.S, recognised by the local obstetric nittee as having special obstetric experience, may attend anyone in their area and who receive of 7 guineas; and (2) general practitioners not ecognised who may give exactly the same care to patients on their own lists, for a fee of 5 guineas—again whether they attend the labour or not. The local obstetric committees who appoint the G.P.O.S consist of the medical officer of health, a specialist obstetrician, and two local practitioners; but they seem to have been given no guidance on the principles they should follow in appointing G.P.O.S, with the result that in many regions they have put all or nearly all the local general practitioners on the list.

It was intended that the National Health Service should leave the pattern of midwifery in the country much as it had been, with midwives delivering most of the normal cases, and doctors taking their usual number of confinements and coming to the help of the midwives when difficulty arose. The proportion of confinements attended by doctors before the start of the service was actually very small. Up to July, 1948, more and more practitioners were refusing midwifery, which meant that difficult cases were gradually being concentrated in the hands of a small minority. In other words, an unofficial group of G.P.O.S was developing. Under the N.H.S., however, this trend has been steadily reversed, and doctors are taking over a higher proportion of deliveries. For this there are several explanations. Apart from the medical reasons which oblige a practitioner to assume responsibility, he may wish to widen his experience, or he may fear he will be taken off the G.P.O. list if he does not attend enough cases. Again, he is now adequately paid for the case, which, if he is conscientious, is bound to make him feel personally responsible. (Sometimes, probably, he has not digested the regulations which make it clear that he is not supposed to attend the confinement unless this is *necessary*.) He may well be constrained, too, by the need to keep up his general list: if he does less midwifery than his competitors he may lose patients to them. Finally the patient may ask him to be present, and he may find it hard to refuse. There are at least three reasons why a mother believes she is better off with a doctor than a midwife. She knows that any doctor can give her an analgesic, or even, if she needs it, an anæsthetic; whereas methods of analgesia available to midwives are limited. (The mother cannot, of course, be expected to know that an anæsthetic given in a normal case is not merely unnecessary but is likely to cause delay and lead to instrumental delivery.) Secondly she is accustomed to trust her doctor in sickness, and likes to have him in her confinement. The third reason is less important but must also be operating. In the past the mother who could afford it employed a doctor, the others had midwives: so here is an opportunity to override a former class distinction.

All these powerful drives are having their effect, doctors are taking on more normal cases, and midwives are finding themselves pushed into the rôle of maternity nurse. The danger is that in time this will have a disastrous effect on recruitment: the modern type of able midwife will die out, and something inferior will take her place—perhaps merely a glorified gamp.

Doctors can hardly be blamed for choosing to deliver more patients: they get no addition to their fee for doing so, and their motives, though somewhat mixed, contain a considerable proportion of altruism. Moreover they ask, reasonably enough, how they are to

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om a statement prepared by the Standing Maternity and idwifery Advisory Committee and endorsed by the Central lealth Services Council. Extracts from the statement appeared n *The Lancet*, Aug. 6, p. 262.

st-*grad. med. J.* 1949, 25, 291.

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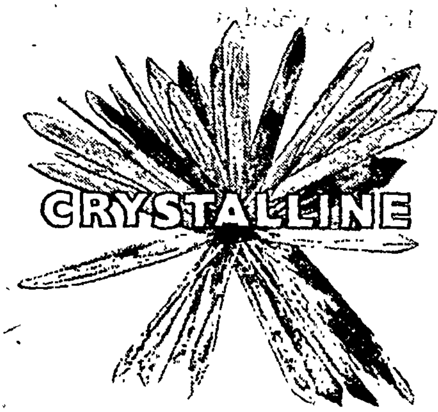

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GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434 e to be a midwife. The doctor, for his part, t recognise that when all is going well there is need for him to take the delivery out of the wife's hands. After all the mother is at the heart his controversy; let both her attendants study *she* can best be served.

"Dumping" after Gastrectomy

ARTIAL gastrectomy remains the standard, and bably the best, treatment for peptic ulcers requiring gery. In a large majority of patients it achieves aplete relief. In a minority, however, it has pleasant sequels; and one of the commonest of se is the "dumping syndrome."

The symptoms are a feeling of warmth, sweating, usea, weakness, palpitation, and fullness, tightness, pain in the epigastrium. They may compel the ferer to cease work and lie down; indeed he may en faint. Though sometimes delayed for an hour two after eating, the attack usually starts towards e end of, or immediately after, the meal. It does t follow every meal, and those afflicted find that rtain foods or types of meal cause it. The pleasant sensations usually pass off in about half hour, or at once after vomiting. In most cases e syndrome appears when the patient resumes a ll diet after gastrectomy and happily it often sappears spontaneously after a few months. The atures of a typical attack were graphically described these columns two years ago by "M.D.," himself sufferer.[1]

The mechanism of such attacks has aroused much terest. After gastrectomy fluctuations of the blood- gar become wider and more sudden than normal; nd hypoglycæmia, hyperglycæmia, or increased sensi- vity to insulin have been invoked as causes of umping symptoms. But a further hypothesis—that ttacks are due to excessive distension of the jejunum y food tipped quickly out of a sphincterless gastric ump—has lately received fresh support. Irvine[2] ound no correlation between the timing of symptoms nd the level of the blood-sugar, and he attributed he trouble to mechanical distension of the small testine. In a healthy man with a normal gastro- ntestinal tract Machella[3] has now produced symp- oms akin to those of the dumping syndrome by apidly distending a balloon in the jejunum and by ntroducing into the jejunum, through a tube, hyper- onic solutions of glucose or of magnesium sulphate. urthermore, in sufferers from dumping, protein ydrolysates, administered either by mouth or directly nto the jejunum by tube, produced severe attacks. In Machella's series there was no relation between lood-sugar levels and symptoms, and intravenous njection of glucose did not produce attacks. Meals of high osmotic potential most often evoked symp- toms. In normal people Machella recovered, via a Miller-Abbott tube, large volumes of fluid from the jejunum after introducing 30 ml. of saturated magnesium-sulphate solution; and many of these normal people experienced dumping symptoms during the experiment. He thinks that jejunal distension causes dumping symptoms, and that jejunal distension is due not so much to the bulk of the meal as to hypertonic chyme attracting water to itself from the jejunal wall and thus rapidly increasing its own bulk by an osmotic process. Attacks can be prevented by taking food dry and by uncomfortably large doses of atropine, but not by vagus resection.

Machella's evidence and ideas are of great interest; but they do not fully explain those cases in which dumping arises two or three hours after food. We observed two years ago[4] that further work was needed to elucidate the riddles of the dumping syndrome. This still holds good.

Food and Fecundity

Lord Horder's address to the British Association, which we publish this week, followed a survey of World Population and World Food-supplies by Sir John Russell, F.R.S., the president. The world population, said Sir John, is now estimated at 2300 million and is believed to be increasing by 20 million a year. Some 11,000 million acres of land. or about a third of the total land area, is said to be "climatically suited" to agriculture; but for various reasons only 3000–4000 million acres is used, and 10–15% of this is devoted to industrial crops. Thus, on the average, each person in the world is fed on the produce of about $1^{1}/_{2}$ acres of land, whereas 5 acres might be available for the purpose; and there is therefore room for agricultural expansion. On the other hand, the development of new land is very costly, requiring development of transport, storage, and marketing facilities, and it is not undertaken unless profitable markets are assured. Sir John Russell accordingly concluded that the most hopeful way of increasing world food-supplies is by more intensive cultivation of the land already in use. In describing what modern equipment and modern science can do to raise the output of the soil he left most of his hearers unperturbed by the fact that everyday an additional 50,000 people sit down to the world's breakfast. An equally cheerful note is struck in a recent symposium on Freedom from Want.[5]

Nevertheless if expansion and improvement of agriculture were our only possible answer to over-population and existing malnutrition the prospect for mankind would certainly be dark. Just over 150 years ago that "clear-sighted English clergyman" Thomas Robert Malthus set out his two postulates—first, that food is necessary to the existence of man; secondly, that the passion between the sexes is necessary, and will remain nearly in its present state—and drew from them the conclusion that:

> "population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison of the second. . . . This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall somewhere; and must necessarily be severely felt by a large portion of mankind."

It is true, as Lord Horder says, that in Western Europe Malthus's law has not operated; and he quotes A. N. Whitehead's three reasons for this—the expansion of commerce, the development of technology, and the discovery of empty continents.

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[1] *Lancet*, 1947, ii, 596.

[2] Irvine, W. T. *Brit. med. J.* 1948, ii, 514.

[3] Machella, T. E. *Ann. Surg.* 1949, 130, 145.

[4] Leading article, *Lancet*, 1947, ii, 549.

[5] Freedom from Want: a survey of the possibilities of meeting the world's food needs. A symposium edited by E. E. DeTurk. *Chronica Botanica*, 1948, 11, no. 4.

maintain their skill in midwifery if they are to attend only abnormal confinements, and those only occasionally. Increasing numbers of mothers are now being delivered in maternity homes, and the Ministry of Health propose in time to provide hospital beds for 75% of maternity patients. This fact, coupled with a falling birth-rate, will reduce the amount of domiciliary midwifery still further, and with it the doctor's opportunity of getting experience. This trend would not seriously affect their work, practitioners say, if they were given the chance of being associated with hospital maternity units; but reports from many parts of the country indicate an opposite policy on the part of hospital management committees: experienced and well-qualified men, it seems, some with higher diplomas in obstetrics who have served on their local maternity hospitals, are being told there is no future place for them in the hospital field.

But if general practitioners feel that their case is strong, it is fair that they should look again at the case as the Royal College of Obstetricians and Gynæcologists and the midwives see it; for this too is strong—perhaps on balance stronger. In the first place, if every general practitioner chooses to take up midwifery again, the average amount each will do will be very small. The birth-rate is about 21 per 1000 population and if 75% of mothers are to be delivered in hospital each doctor in the country will then have 5 domiciliary confinements a year for each 1000 on his list—a possible maximum of 20 deliveries, most of them probably of multiparæ. Even if he delivers them all (and time and multiparæ wait for no man) he will never be able, on this material, to achieve or maintain a high standard of skill in obstetrics. Furthermore, the doctor with most opportunity for midwifery will be the doctor with the big list, who should have no time to do it. Meanwhile some 10,000 domiciliary midwives in the country are faced with loss of their normal work. The standing of these midwives is very high: in England and Wales in 1947, those superintended by the Queen's Institute of District Nursing (the bulk of rural midwives) had a maternal-mortality rate for all booked cases, including those transferred to a doctor or hospital, of 0·74 per 1000 births, against 1·17 for the country as a whole. This good record must be attributed largely to the midwife's thorough training, during which she delivers at least 30 mothers (at least 10 of them in their own homes) and nurses 40 or more patients through the puerperium. It is worth comparing this experience with that of the medical student, who in his five or six years' training gets signed up for 20 cases, during the three months he spends in the obstetrics and gynæcology unit. He rarely gets much practical instruction in obstetrical analgesia, nor does he have any first-hand experience of the nursing management of the puerperium. Indeed, as Prof. HILDA LLOYD pointed out at the recent Congress of Obstetricians and Gynæcologists, the newly qualified midwife has had far better training in normal obstetrics than the newly qualified doctor; and though the latter is given good theoretical teaching on the common abnormalities it is possible for him to qualify without having seen examples of them.

There are of course many doctors in general practice who, after qualifying, gained further experience by taking a post as a resident obstetric officer; there are many splendid obstetricians among There are others—some, perhaps, equally good have frankly learned their obstetrics by pra frequently. But there are also some who have made themselves really proficient. Whereas the is closely advised and supervised throughout professional life, and is given refresher courses, young doctor going into practice has neither of th advantages. He may have a senior partner whom can call out when he is really worried, but this is a privilege any junior partner would care to nor is it always available. In these general-practitioner midwifery cannot be reproach; and in fact analysis shows that it is Sir EARDLEY HOLLAND said at the congress that had first grasped the full significance of the m mortality figures when he was set the task, duri the war, of investigating every maternal death in large county. The commonest causes of death wer shock or hæmorrhage or both; and he found that least half these deaths could have been avoided b using "ordinary standards of midwifery." T disturbing finding bore out that of the Departmen Committee on Maternal Mortality,[3] which in 193 assessed avoidable maternal deaths at nearly half th total number.

One other factor comes into play in the conduct the normal case. The midwife has more time tha the doctor to give to the mother; indeed, she ca often stay with her throughout labour—a reassurin and psychologically valuable service in itself. Sh has no way of hurrying things on; unlike the doctor who has many other calls on his time and must sometimes find the temptation overpowering to hasten normal delivery with instruments. Possibly there is le meddlesome midwifery today than there has bee at any time since the CHAMBERLEN brothers invente their humane device; but we must not pretend tha it does not exist, nor must skilful and patient doctor assume that all their colleagues share their abilit and self-discipline. For this and the other reason stated, the Royal College of Obstetricians and Gynæcologists believes that the normal case should be le to mature naturally under the care of the midwife She should of course have behind her a propert trained doctor—either a pure specialist or a selecte general practitioner who is responsible for not le than 100 cases a year and is associated with the loca maternity unit. The college fears that if we retur to the old combination of maternity nurse an family doctor without special training (which wi be the outcome of the present trend unless it checked) we shall pay a heavy price in materna lives and disability; and it is unlikely that an doctor would wish to insist on his right to practis midwifery at such a cost.

Our best hope in the present trouble is tha the doctor and midwife will work together as team; and though this would be easier if they wer under a single authority, as Sir WILLIAM GILLIAT suggests, it is not beyond the scope of human natur even as things stand. The midwife will never objec to doing a reasonable amount of maternity nursing as she has done in the past; but she cannot b expected to accept a situation in which she mus

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3. H.M. Stationery Office. 1930. Pp. 151. 2s.

Annotations

HOSPITAL MANAGEMENT

England and Wales alone some 7000 volunteers serving on hospital boards of governors, regional ds, and management committees. In a new and il report[1] on how the hospital service is managed, P. describes it as a curious hybrid. It is a State ice, yet the managers are nearly all volunteers and of them are civil servants. Management is carried [illegible] the local-government [illegible] el at home, yet the [illegible] of Health and are responsible to an electorate. There is considerable ntralisation,' and even local autonomy, "yet the ister's writ runs throughout the service far more tively than in the case of any nationalised istry."

he Minister's intention was to create a two-tier inistration by regional boards and management mittees; but this has been extended above by the ustry's concern with matters of detail, and below by [illegible] of house committees to meet the needs [illegible] pitals.

> "It is difficult to believe," P.E.P. says, "that the resent balance is anything but temporary, and the experince of the first year would indicate that effective control s shifting towards the Ministry of Health. If it continues, his shift will deprive one of the subordinate levels, probably he regional boards, of much of its reason for existence."

is, in P.E.P.'s opinion, would be unfortunate: if onal boards and management committees are not be given autonomy, it might be better to have direct nistry administration with advisory committees at al levels.

> "It can be argued that to judge on the experience of the first year is unsound, since the Ministry was bound to keep the strings in its own hands during the formative period. Yet in view of public anxiety about the high cost of the health services it is difficult to believe that the Ministry, whatever its own wishes, will not be under constant pressure to concern itself with matters of detail."

The report examines the present method of appointent from above to boards and committees. "Taken a whole, the members of the new boards and comttees are as able and devoted a set of people as could found in command of any public service." But, dged by traditional standards, the principle of appointent by nomination from above is undemocratic, for e control which can be exercised by the people is at est very remote; the test of this system will be whether can secure better people and more balanced comittees without sacrificing that responsiveness to public eds and opinion which is, or should be, the mark of the lected representative. P.E.P. holds that the right to hare in management should not be confined to doctors nd dentists; senior members of the nursing profession, or example, have a good case to be put on the same ooting. "While there is no reason to fear that doctors nd dentists as individuals will abuse their privileged position, the possibility of the growth of medical 'syndicalism' cannot be entirely ignored." Doctors, dentists, and most others who earn their living can ill spare the time demanded of them by committee work. The burden of this might be lightened either by drawing on a wider circle of people (and in this connexion cooption to house committees should be encouraged, for these are valuable training grounds for management committees), or by reducing the amount of work which management committees themselves have to do; some of the committees' detailed work could perhaps be delegated to officers. "The tendency for the secretary to concentrate on the office side of his work, in the absorption of a mass of information, guidance, and directives from the Minister of Health and regional boards, and in the organisation of the business of his committees, all lead him away from the more solid task of knowing his hospital or hospitals and his more appropriate function of business manager and coordinating officer."

On the fundamental question of finance, the report urges that regional boards should be given block grants for both capital and maintenance expenditure over a period of, say, five years. Regional boards would then have to be granted some additional control over the activities of management committees; but this need not interfere seriously with the autonomy of these bodies.

> "Such a method of financing would relieve the Ministry of Health of the need to concern itself with matters of detail. . . . Clearly, this could not happen until the Minister was relieved of the need to be answerable to Parliament except on broad questions of policy. At the same time, the Minister would have to take a more liberal view of the degree of uniformity among hospitals throughout the country which it is desirable to achieve."

Looking to the future, the report suggests that as the service passes from the exciting formative stage to that of routine administration, the statutory administrative bodies may conceivably develop an authoritarian attitude of mind and become remote from the public whom they exist to serve. Eventually, the answer may be found in the development of regional government, of which the hospital service would be a natural part. A regional authority based on elective principles would almost certainly be empowered to raise its own funds, or a proportion of them, and this would ensure the responsibility to the public which now is only indirectly provided through the Parliamentary franchise.

RADIOTHERAPY IN LEUKÆMIA

THE incidence of leukæmia seems to be increasing. The increase apparent in mortality returns may well be deceptive, for standards of diagnosis have greatly changed and are still changing; but an upward trend has also been noted by physicians and pathologists in charge of hæmatological clinics. Despite this fact leukæmia has not yet attracted much attention from those who finance research, and even in the U.S.A. the funds for this purpose are said to be almost negligible.[1] Though the newer means of treatment—nitrogen mustards and urethane for chronic leukæmias and folic-acid antagonists for acute leukæmias—have been much in the news during the past three years, in this country most patients with chronic leukæmia are still treated with X rays.

Radiotherapy for chronic leukæmia is nearly fifty years old; William Pusey, of Chicago, treated the first case in 1902, and until recent times this method has had no serious rival. For almost as long it has been recognised that radiotherapy is quite useless in all acute leukæmias; and from the first it seemed doubtful whether the treatment actually prolonged life. In 1924 Minot and Isaacs[2] compared 50 cases of chronic lymphatic leukæmia in which radiotherapy had been used with 30 similar but untreated cases; they concluded that the mean survival-time was the same in the two groups. This conclusion—that radiotherapy does not prolong the average length of life—has been confirmed by other workers; but it must be remembered that statistics of this sort cover up the fact that a substantial minority survive longer than the average of three years, and survive in relative comfort because they are treated. As to the

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[1] Planning, no. 303. The Hospital Service: 1.—System of Management. Published by P.E.P., 16, Queen Anne's Gate, London, S.W.1.

[1] Sacks, M. S., Seeman, I. *Blood*, 1947, 2, 1.

[2] Minot, G. R., Isaacs, R. *Boston med. surg. J.* 1924, 191, 1.

VOGT,[6] in a book that one might call "Malthus Up to Date," admits that industrialisation has made it possible, during a hundred years, for the most powerful section of the human race to live as though it were independent of the earth, but points out that industrialisation in Western Europe has been so successful only because it could draw on the food and other raw materials of the new world. He pours cold water on the idea that "industrialisation" on a wider scale will raise the living standards of the whole world: in very special circumstances (which have now largely changed) Western Europe was able to exchange manufactured goods for food; but from whom could the masses of Eastern Asia buy food in exchange for the goods they might manufacture? Only from their own agricultural population. And at present, in VOGT's opinion, it is not even certain that agricultural production will not actually decrease in many areas.

> "The Yellow River transports an annual load of 2500 million tons of soil. There are other rapidly eroding regions and great muddy rivers in China, but the gutted North-West and the Yellow River are the outstanding and eternal symbols of the mortality of civilisation. . . . The Orange Free State, which descriptions of less than a century ago paint as a luxuriant prairie, is today suffering from increasing desiccation. Every year it is ravaged by sandstorms, especially in the western districts. The same situation obtains in the western Transvaal, where the dry steppes adjacent to the predesert areas of the Kalahari are an easy victim of wind erosion, once their plant cover has degenerated."

In the U.S.A. "much has been accomplished in controlling erosion and conserving soil, but in the thirteen years in which the Soil Conservation Service has existed only about 10% of the job of applying conservation measures has been accomplished. This is scarcely enough progress to justify a sense of security. And the Eightieth Congress cut the appropriations of the service! . . . We extract oil, and iron ore, and fine timber, and canvasbacks, and call it *production*. By a distortion of the Prometheus myth, we gobble our own liver and congratulate ourselves on a good meal." Town-dwellers, most of the electorate, "tend not to think beyond the butcher-shop, the can of spinach, and the milk bottle. They have little realisation of their dependence on the soil, grasslands, forests, wildlife, and underground waters."

Sir RICHARD LIVINGSTONE defines a technician as "a man who understands everything about his job except its ultimate purpose and its place in the order of the universe." To some extent most people connected with medical science have in this sense been technicians. Following HIPPOCRATES their great aim has been to save life and they have given little thought to the consequences. It is only during the last hundred years that their efforts have had much effect, and the results are becoming evident. In many parts of the world populations have been helped to increase beyond their food-supply, and the process continues. VOGT writes bluntly:

> "while the United States, through its agricultural technicians and an educational mission, is taking all too inadequate steps to help El Salvador better its condition, it is also coöperating in a health campaign designed to reduce the death-rate even further. Nothing is being done to reduce the birth-rate. As in India and Puerto Rico, this is brutally misguided well-doing. . . . One of the greatest national of Chile, perhaps the greatest asset, is its high rate. This is a shocking statement. if one does not believe there is a virtue in ha people live more miserably destroying their with increasing rapidity, the conclusion is inescapable.

But fortunately, if it is now within our power reduce death-rates it is also within our power limit birth-rates. *Lord HORDER rightly says* that fourth reason why MALTHUS's law does not in Western Europe is the growth of birth-co and it is here that VOGT too sees a way of salvation.

> "The United States," he says, "should lead in available to all peoples of the world the most m information on contraception, and the services of health and educational experts in organising control campaigns. So far as possible, these parallel, if not surpass, the older health programs of the World Health Organisation. Where finds overpopulation, its conservation and production programs should include contraception programs. It should not ship food to keep alive ten million Indians and Chinese this year, so that fifty million may die five years hence. . . . The human race is caught in a situation as concrete as a pair of shoes two sizes too small. We must understand that and stop blaming economic systems, the weather, bad luck, or callous saints. This is the beginning of wisdom, and the first step on the long road back. The second step is dual—the control of populations and the restoration of resources. Unless we take these steps and begin to swing into them soon—unless, in short, man readjusts his way of living, in its fullest sense, to the imperatives imposed by the limited resources of his environment—we may as well give up all hope of continuing civilised life. Like Gadarene swine, we shall rush down a war-torn slope to a barbarian existence in the blackened rubble."

The problem is to find some *means* of creating a judicious balance between population and resources, for so long as *overpopulation* continues to exert an intolerable pressure on food no political system will be stable. If a reasonable balance can be achieved, political systems will become less important; but we must understand that civilisation flourishes only in prosperity, and that, so long as there is a hard struggle for the means of survival, the liberty of thought and person which we in the West so greatly value will be continually threatened. Sir JOHN RUSSELL's figures are reassuring in so far as they show that the amount of food produced for each person in the world could be considerably raised by scientific farming; and Lord HORDER is no doubt right in implying that a rise in the standard of living of backward countries would itself have a contraceptive effect. But it is far from obvious that improvements *in agriculture are going to be made* where they are most needed, or that food surpluses are going to be universally distributed, or that governments and peoples are capable of taking Lord HORDER's "global view," without which *low* standards of living are unlikely to be improved. VOGT's neo-Malthusianism may be unduly alarmist; but we are all too slow to recognise that food and fecundity are basic issues, far more vital than those that *generally interest* statesmen.

THE INDEX and title-page to Vol. I, 1949, which was completed with THE LANCET of June 25, is published with our present issue. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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[6] Vogt, W. Road to Survival. London, 1949.

Special Articles

FOOD AND POPULATION *

LORD HORDER
G.C.V.O., M.D. Lond., F.R.C.P.
IRMAN OF ADVISORY COMMITTEE ON NUTRITION, F.A.O.;
PRESIDENT OF THE FAMILY PLANNING ASSOCIATION

T is six years since Hot Springs saw one of those akenings of conscience, accompanied by a stirring of imagination, which from time to time affect not y individuals but nations, and which, again in nations in individuals, tend so soon to revert to lethargy both the spirit and of the mind. At the United Nations nference on Food and Agriculture, held in May–June, 43, enthusiasm ran high, defeatism was not recognised, d the best brains in the world concentrated upon greatest of all world problems—except perhaps avoidance of war—how to feed the human e.

The spirit of optimism which animated the conference shown in the speech with which President Roosevelt sed the final session :

> “You have examined the needs of all countries for food and other agricultural products, both as they will exist in the short-run period of recovery from the devastation of war. and as they will exist over the longer run, when our efforts can be fully devoted to expanding the production of food so that it will be adequate for health the world over. You have surveyed with courage and with realism the magnitude of these problems and have reached unanimous agreement that they can, and must—and will—be solved.”

The conference offered an excellent rallying-point for perts engaged in studying the new knowledge relative nutrition. Largely as the result of a pooling of the searches of these experts the conference ventured to m up the nutritional position under the following ur headings :

1. The kind of diet which man requires for health has been established.
2. Investigations in many parts of the world have shown that the diets consumed by the greater part of mankind are nutritionally unsatisfactory.
3. Diets which do not conform with the principles of satisfactory nutrition lead to impaired physical development, ill health, and untimely death.
4. Through diet a new level of health can be attained, enabling mankind to develop inherited capacities to the fullest extent.

Two years later the Food and Agriculture Organisation F.A.O.), the first of the international organisations nder United Nations, was set up. We were asked to dvise on certain nutritional targets, taking due account f regional differences in consumption habits and ossibilities of production.

THE FOOD

It was the job of F.A.O. to find out how much food was necessary to provide the world with the requirements e laid down. The answer ran into figures which the journalist is wont to call “astronomical.” It was found hat by the year 1960, as compared with pre-war supplies, here would be a need of 60 million more tons of cereals, 0 million more tons of meat, 250 million more tons of vegetables and fruit and 35 million more gallons of milk. As Sir Herbert Broadley, Deputy Director-General of F.A.O., comments : “a vast undertaking indeed.” Yet, such is the spirit and determination of those who lead F.A.O., there was no flinching from this gigantic task. Faced with “damage by nature and wastage by man,” with “disastrous exploitations of forests, ill-conceived methods of cultivation and short cuts to wealth,” F.A.O. turned confidently to the factors by which repairs could be effected, untilled land brought into cultivation, and technology harnessed to intensive production.

And who, listening to Sir John Russell's presidential address to the British Association—with his almost embarrassing catalogue of potential aids to agricultural development—who can doubt the ability of science to serve our ends in these directions ? The now famous Point IV in President Truman's inaugural address was not a mere mirage ; it was a call to action, and action based upon the established facts of science. To deal adequately with this technological position Sir Herbert Broadley pleads for a World Food Fund, which would supply the sinews of war. Sir Herbert thinks that the feeling of responsibility is growing amongst the nations. Let us hope he is not too sanguine in this, but we do not forget that Lord Boyd-Orr's effort at securing a World Food Board failed, and failed because member nations manœuvred for position and for power.

But it is not only in the technological field that effort is required ; there is also the economic problem that must be tackled. It is not only a question of producing more food ; surpluses and slumps have to be dealt with ; the food and the hungry people must come together ; the producer must not be induced to “pull his punches” in one place whilst human beings are being underfed in another. “A world economy which does not provide agricultural and industrial producers with a fair basis for exchanging the products of their labours will frustrate the best endeavours to increase the supply of food which the world so much needs.”

What is the present position in respect of all this ? As the result of a world tour quite recently undertaken by the present Director-General of F.A.O., Mr. Norris Dodd summarises his observations as follows :

1. Methods of food production still in use in many parts of the world are extremely primitive.
2. The conditions under which the majority of agricultural producers live are “terrible.”
3. Although they are producers of food, the great portion of the farmers have themselves an inadequate diet.
4. There are great possibilities of development, whether at the level of large projects of irrigation and draining or by the less ambitious method of providing the peasants with efficient hand tools. There are also great possibilities of improving agricultural production in all countries of the East.

Despite all this leeway to make up, the Director-General is not defeatist. Speaking to the United States' farmers the other day he said :

> “I have faith that it is not hopeless ; on the contrary, with the help of modern science, backed up by common sense, hard work, and international good will, I believe mankind can do a far better job of producing and distributing food than ever before. I am not optimistic enough to think that the world of plenty is just round the corner, but I am sure it is down the road, and we shall eventually come to it if we only make the right start and keep moving.”

THE POPULATION

“Yes,” says the critic, “but what about the world population ? What about Malthus's law ?” Well, though common sense tells us that Malthus's law must be accepted, a little thought shows that it has only a limited and a local application. Like so many “laws” relating to human affairs, it is an over-simplification. The desire to reduce human affairs to “laws” often overrides itself. It is not only in “this our life” that the soul gets “a dusty answer” when “hot for certainties” ; in demography the same thing happens. Applied to China Malthus's law clearly operates, or may do so. The population of China is estimated—reliable figures are not available—at between 400 and 500 million,

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* Read before the British Association at Newcastle-on-Tyne on Sept. 13.

application of the treatment, some have favoured limiting it to obviously affected areas like the spleen, or to masses of enlarged lymph-glands; others prefer irradiation of the whole body, or "spray" techniques. Piney,[3] however, has pointed out with justice that the results obtained with different techniques are all about the same; "the length of the remission which is brought about is no longer when one radiological technique rather than another is employed, and the development of radio-resistance is not accelerated or postponed by any particular dosage or by exposures of different areas."

The indications for treatment have been well stated by Sturgis,[4] who puts them in the following order of importance: increasing anæmia; symptoms of pressure or pain in the spleen; progressive loss of weight; a large increase in the total number of circulating white cells or of immature white cells; increasing fatigue; progressive enlargement of the spleen or lymph-nodes; and, possibly, the onset of hæmorrhages. The white-cell count, it will be noted, does not head the list. It is certainly tempting to regulate treatment by the total white-cell count alone: it is quickly estimated, and the result provides some guide to progress and shows when treatment should be stopped. In chronic myeloid leukæmia, however, the differential count must also be watched, because, as Israëls [5] pointed out, if myeloblasts increase the prognosis is bad no matter how far the total count is reduced towards normal. Moreover, in chronic lymphatic leukæmia the patient may well have a high total white-cell count, but if he has no anæmia and the general condition is good it may be years before treatment need start. In the first issue of the new and attractive *Journal of the Faculty of Radiologists* [6] R. Bodley Scott reminds us that the clinical course of chronic lymphatic leukæmia tends to differ from that of chronic myeloid leukæmia; for the clinical and hæmatological remissions common in the myeloid form are unusual in the lymphatic. Here, for months or years, the patient suffers no more than the inconvenience of enlarged lymph-nodes; X-ray treatment may be needed to reduce the size of these tumours, but no attempt should be made to keep the total white-cell count low. Then, quite quickly, deterioration sets in, with asthenia, emaciation, and increasing anæmia, and despite treatment the patient dies in a few weeks or months; in this brief stage control of anæmia and infection is more important than control of the leucocyte-count.

It has yet to be shown that nitrogen mustard treatment will prolong life, on the average, any more than radiotherapy will; but its use is often more convenient and relieves the demand for use of X-ray apparatus. Both forms of treatment act by causing cell destruction or inhibition of cell mitosis, and the criteria for their control are essentially similar.

PUBLICITY FOR DISCIPLINARY PROCEEDINGS

THE Minister of Health has been considering the question of publicity for disciplinary proceedings taken against doctors, dentists, or pharmacists before their respective service committees. In an advisory letter to executive councils he says that, whatever method of publicity is adopted, "at no stage should mention be made of the names of the parties to the proceedings or of other particulars which might lead to their identification." The actual proceedings before the service committees should always be private, and nothing should be said about their reports before they have been considered by the executive council. The press should not be admitted while the executive council is considering report of a service committee, but can be told of council's decision, and may, if the council thinks fi given a summary of the case as reported by the ser committee and of its findings. When in due course Minister has given his decision on any case, it w again be open to the council to give further publ and in the Minister's view this would be proper in se cases. This would be no departure from establ custom; for under the National Health Insurance the insurance committees were in the habit of circul (with due regard to anonymity) an account of all ciplinary proceedings and findings to all the practiti on their lists; and cases of particular interest often described in the medical press.

RELICS OF JENNER

HISTORIANS must feel warmly to the great ma becomes famous in his own lifetime: his admirers k whose letters to keep, whose spectacles, snuffbox, lancet will be reverenced by posterity, whose little j will last for centuries. Jenner, a lovable man wh jokes were in any case good, left pleasant memories many people; and many personal tokens of him surv and may now be seen in his bicentenary exhibition the Wellcome Historical Medical Museum, 28, Portm Square, London, W.1. The trustees of the muse have published an excellent catalogue of the boo portraits, manuscripts, and relics in this exhibiti which not only describes the many items shown but car notes on Jenner's life and work, on smallpox inoculati on vaccination in Britain from 1798 to 1823, and developments since. A plate at the end shows portrait medals, each giving a different version Jenner's face, alike in nothing but a look of intellig benevolence. Monteverdi's pleasing if imaginative rec struction, in bronze, of Jenner vaccinating his appears as the frontispiece.

CLAIMS AND THE CRISIS

IT is unlucky that the negotiations over the remune tion of general practitioners should have come to a h at one of the peaks of the economic crisis, when Government are more anxious than ever to avert ri in salaries and wages. A survey lately made by Ministry of Health is said to give a reassuring picture practitioners' incomes in the National Health Servi but the general medical services committee of British Medical Association is not fully satisfied wi the evidence, and a deputation met officials of the Min try on Sept. 23 to press the committee's claim for further £16½ million to be distributed among prac tioners. Though it seems improbable that such a su would be actually paid in present circumstances, t fact does not affect the validity of the claim, and trust that it will be considered strictly on its merits.

Evidently the Government mean if possible to av cutting the social services, whose value to members the public is of course greatest in times of hardship. Sept. 25 Mr. Aneurin Bevan said that he had made his mind that the National Health Service was not goi to be touched; and there was no disposition by t Government to touch it. "The Government," he add "have made up their mind to solve their proble without raiding the social services, and the health servi is sacrosanct."[1] Previously the Chancellor of t Exchequer had said that "*no economies are to be ma in expenditure on defence and the social services, a that any cuts decided on must fall on administrati expenditure.*"[2] It will be recalled, however, that earl this year the Chancellor was considering whether charg might not be made, or a special tax imposed, to co part of the expenditure on the National Health Servic

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[3] Piney, A. *Blood*, 1948, 3, 885.

[4] Sturgis, C. C. Hematology. Oxford, 1948; p. 554.

[5] Israëls, M. C. G. *Lancet*, 1939, i, 317.

[6] This journal, edited by Dr. Peter Kerley, F.R.C.P., is obtainable from the faculty at 45, Lincoln's Inn Fields, London, W.C.2. Four numbers will be issued each year, and the annual subscription is 42s.

[1] *Times*, Sept. 26.

[2] *Ibid*, Sept. 21.

SPERM QUALITY

A. G. **OETTLÉ** (South Africa) and Mr. G. **VAN**
ELEN, D.V.SC., have developed a theory of sperm
based upon the known facts concerning develop-
and subsequent loss of the characteristics of
y and ability to fertilise and to ensure completion
ryonic development. It is hoped that a considera-
the subject in this way may help to show where
work is needed to fill in some of the many gaps
vledge.

ANOVULATORY FAILURE

G. I. M. **SWYER** described a method of treating
ulatory failure" by oral administration of stilb-
and ethisterone in cyclic courses. He reviewed
ults in 40 women in the reproductive years. In
presenting symptoms were prolonged and excessive
r uterine bleeding; in 13 the periods were scanty
requent, or, if regular, were anovular; and in
ndary amenorrhœa had been present for one year
. In the first group evidence for the re-establish-
f ovulation was found in 8 cases and there were
nancies; in the second group the results were
; but in the third group no successful results at
d be claimed.

discussion centred on the problems in diagnosing
tory failure before treatment and eliminating
eous cure—in other words the difficulty of
g results to the effect of treatment.

RE-ESTABLISHMENT OF OVULATION

ALBERT SHARMAN (Glasgow) read a paper on the
lishment of ovulation post partum and post
n. This work forms part of a wider investigation
s not yet completed. He referred to five previous
ations on the re-establishment of ovulation—all
l series of cases—with considerable discrepancies
results. His own series consists so far of 628
trial biopsies in 283 women post partum and
psies in 36 women post abortum; 17 patients have
re than 10 endometrial biopsies performed during
e months following delivery, several having been
l at weekly intervals and one patient weekly
nty-four weeks. From this material Mr. Sharman
e to give a full account of the re-establishment of
ry cycles and their relationship to lactation.

ENDOMETRIOSIS

G. **DOUGLAS MATTHEW** (Edinburgh) discussed
endometriosis in relation to sterility and showed
ditional disorders, such as fibroids, metropathia
hagica, and fixed retroversion frequently coexist.
sis may be most difficult, especially since the
of symptoms is not necessarily related to the
of the disease; laparotomy therefore is the only
diagnostic procedure. Conservative surgery is the
nt of choice; if this is rewarded by pregnancy
currence follows, more radical measures can
ently be adopted.

PERITONEAL POCKETS

. **BENDER** (Liverpool) drew attention to peritoneal
as a cause of sterility. They usually result from
peritonitis, which may or may not have caused
lamage. Although tubal patency is carefully
gated in cases of sterility, attention is seldom
the pathway between ovary and abdominal
Obstruction of this pathway, or pelvic block,
due to a pelvic pocket in relation to the abdominal
—easily demonstrated by salpingography—but it
o be due to the ovary being pocketed away from
eral peritoneal cavity, and then the pelvic block can
nosed only at laparotomy or possibly by culdoscopy.

PREVENTION OF ABORTION

LINTON SNAITH (Newcastle-on-Tyne) has been
œstrogens in the treatment of threatened and
habitual abortion for the last two years. In threatened abortion, provided it is not inevitable, an initial intramuscular injection of 10 mg. of œstradiol benzoate is followed by oral œstrogen therapy. In habitual abortion œstrogens are given by mouth, starting a few days after the first missed period. Of 31 patients in this group (in half of them stilbœstrol alone has been used) so far 25 have advanced sufficiently to be regarded as successful cases; in many of these other methods of treatment had previously failed. Among these cases there is a surprisingly high incidence of toxæmia of pregnancy. Mr. Snaith concluded that while there is no evidence that œstrogens do harm in pregnancy, they may be beneficial, especially where "blighted embryo" in the early months of pregnancy has given rise to repeated abortion.

In the discussion attention was drawn to the difficulties of defining habitual abortion and of assessing the results of treatment. It was curious how, despite the difference between their treatments, nearly all authors secured approximately 80% of successes. The random distribution of abortion sequences, as in the classical description of Malpas, had to be considered, and it seemed that only an extensive controlled trial could be expected to prove the value of any therapeutic régime.

SEMINAL STUDIES

Miss **URSULA PARSONS** (Cambridge) described the work which she and Dr. T. Mann have done on the effects of testicular hormones on the formation of seminal fructose. Very considerable variations in the seminal fructose concentration—both in the same and in different individuals—are found in man and in rabbits. In the latter, however, castration is followed by a fall in the seminal fructose almost to zero, while the administration of testosterone is followed by the rapid return of the fructose to normal levels, from which it falls again on removal of the implant. Dr. **MANN** described how the fructose content of the castrated rats' prostate and seminal vesicles are used as an indicator of androgenic activity; this method is far more sensitive than weight-change and, he suggested, should prove satisfactory for androgen assay. By this means it was possible to detect as little as 0·05 mg. of testosterone and to show that progesterone had about $^1/_{2000}$ the androgenic activity of testosterone.

Mrs. **CLARE HARVEY** (Exeter) described a relatively simple method of estimating the rate of liquefaction of blood-fibrin by seminal fluid. The time of liquefaction of a constant quantity of fibrin is related to the fibrinolysin activity in a manner expressed by $\log C = a \log T + K$ where a and K are constants, C is the fibrinolysin activity measured in arbitrary units, and T is time. A regression equation calculated for 99 points from 30 specimens of semen gave a very good fit for a further 110 points from 45 other specimens. The distribution of enzyme activity was found to be asymmetrical, most specimens having a total activity below 50 units. No correlation was found between enzyme activity, sperm motility, seminal volume, time of continence, or fructose content. The residual viscosity of semen is not closely related to enzyme activity, but citric acid, thrombin, and fibrinogen content may be at least as important as fibrinolysin activity in determining the final consistency of the seminal plasma.

FUTURE MEETINGS

At the close of the meeting it was decided that these conferences should be continued. It was also decided to form a committee, of which Dr. A. Walton and Dr. G. I. M. Swyer were elected joint secretaries, the functions of which should be: (1) to arrange for a conference next year, and (2) to plan for the formation of a society to study problems in comparative fertility.

and is probably increasing at the rate of 6 million per annum. During peace, China can feed some 400 million people on the basis of a mere subsistence level. If she desires a higher standard of living, which connotes a diet giving a better margin of nutrition and therefore of health, she must do one, or both, of two things; either she must grow, or import, more, and more varied, food, or else she must limit her population increase. But China may do all of these things and so demonstrate that, even in her case, Malthus's law may not be operative. The time factor is clearly imperative; will increased production, with or without importation, catch up on increased population? Or will it not?

In Western Europe, on the other hand, Malthus's law does not operate at all, nor has it for a thousand years—and for three reasons, as pointed out by Professor Whitehead: the expansion of commerce, the development of technology, and the discovery of empty continents. Although China cannot find more empty continents, industrial expansion and technological development have scarcely begun with her.

But there is a fourth factor which has operated in making Malthus's law of no sociological significance in Europe during recent years, and to which Whitehead makes no reference. This is the practice of some form or other of birth-control.

It has been alleged that so called "primitive" populations would have nothing to do with family limitation in any form, that large families are a tenet in their religion or tradition. But the view of those who have actually lived amongst such people tells a different story: the womenfolk frequently ask for information on the spacing of their children. It would seem an almost universal desire of women to seek help against the bondage of too frequent pregnancies. The working out of the principle of contraception in face of the traditional cultures and social institutions in China and elsewhere will probably fall to the lot of the women themselves. Hence the value of antenatal, neonatal, and other clinics where women may receive instruction.

Two further considerations are pertinent in this connexion. The first is that governments and other controlling authorities should not only allow, but should encourage, contraceptive instruction. Thanks largely to the work of the Family Planning Association this position has been, in a fair measure, secured in this country. Public opinion, as always, has dictated policy.

The second consideration is that more research should be undertaken in pursuit of simple, but effective, techniques. I think it was that courageous and persistent pioneer, Margaret Sanger, who commented on the fact that whereas we had succeeded in splitting the atom, with certain dire consequences to human life, we had not yet found a simple and harmless contraceptive. But we shall, and perhaps by a method quite different from those in present use. In scientific discovery the wind bloweth whither it listeth and we cannot foresee the direction in which any new addition to our armamentarium towards the goal of human progress will appear. Nor, I am inclined to add, to what bad, as well as to what good, purpose *man* will put it.

What really matters is that we possess the will to achieve biological control, as to which many of us are still in the stage of confused thinking.

I do not mean by these remarks that I regard intensive propaganda concerning the voluntary limitation or control of births as the panacea for the maladjustment of food and population in the world. History shows that when the standard of living rises, by whatever means this be achieved, such propaganda from without a social group becomes less and less necessary. It may be said of any nation that if it raises its standard of living this matter, as many others, will be added unto it.

THE SPIRIT OF MAN

Sir John Russell has warned us that though can be a very efficient provider of benefits it does make a choice, or a decision, as to their use. That with the spirit of man.

But on this point, even after a second world I am an unrepentant optimist. I take it that a may quote himself without being charged with plagi At the meeting of this Association at Blackpool in l speaking of the strain of modern civilisation, I tou on this subject. I said:

> "I believe that 'man can elect the universal I have faith that the human heart *is* 'made of pene stuff.' I do not think that 'damned custom' has ' it so. That it is proof and bulwark against sense'; t at this moment a morbid Hamlet, looking on, doubtless take a different view."

Today I shall conclude my admittedly cursory re of the position by a statement which, in respect o I may call my creed:

1. We must take a global view of the problem; unles do so we cannot hope to solve it.
2. We must work, for we cannot escape the injunct "if ye do not work neither shall ye eat."
3. We must encourage ideas and we must secure com autonomy for science.
4. We can, if we will, achieve physical, chemical, biological control on the earth and thereby effe satisfactory adjustment in regard to food and popula
5. Moral control is the ultimate and overriding consic tion. Its most primitive expression is "live and live." Without this even survival cannot be assure

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CONFERENCE ON INFERTILITY

A CONFERENCE on infertility—the sixth in an an series—was held in Edinburgh on Sept. 17 and under the auspices of the Family Planning Associatio

TESTICULAR BIOPSY

In the opening paper Mr. W. SELBY TULLOCH (E burgh) described a technique of testicular biopsy by him as an outpatient procedure. It is perfor under local anæsthesia, 10% procaine being inje into the spermatic cord and into the scrotum at the of incision; suture of the tunica albuginea prev hæmatoma formation. In none of his cases has operation involved absence from work.

In the discussion that followed attention was dr to the danger of testicular damage from the X- treatment of spondylitis ankylopoietica and to absence of evidence of inflammation in biopsies f testes which have been the site of mumps orchitis.

SEX BEHAVIOUR

Mr. ARTHUR WALTON, PH.D. (Cambridge), showed t characteristic male sex behaviour is not sex-spe since it is exhibited by the prepubertal male, it n persist after castration, and at least in some specie is normally exhibited by sexually excited females. pattern is innate and shows the phenomenon of "driv which increases in the absence of normal outlet so t a substitute outlet may be found. Experimental w on rabbits has shown that the threshold of respo and the degree of completeness of the pattern depe on two factors—the sex drive of the male and excitatory value of the sexual object. The motor patt and accompanying reflexes can become highly conditio to external stimuli, as Dr. Walton illustrated from study of the behaviour of bulls during semen collecti for artificial insemination.

In the discussion the importance of lack of sex dr as an infertility factor was exemplified by the incide of 5% for intact hymen among wives of infertile coupl ıe percentages gradually reach a maximum at just 70%. The low figure in the adult age-group is ımably due to failing memory about infantile illness to less interest taken in the history of other infectious ıse in the case of older patients.

ıe level of notifications in 1945–48, however, if inued, would imply that only about 60% would be ıed before the age of 15, a considerable fall in risk ıttack as compared with pre-war conditions. A lar series of figures for England and Wales as a le is not available; there were no national figures re 1939, when measles became generally notifiable ıe country. Stocks (1949) has calculated, however, the average notification-rates experienced in land and Wales in 1944–47 if continued would ly that only 47% of children will have a notified ck before the age of 15. The difference between national proportion of 47% and the London proıon of 60% is presumably due to the different dard of reporting outside London, with possibly a ing incidence depending on population density; the difference in London between the pre-1938 portion of 78% and the post-war proportion of 60% ot due, so far as can be judged, to any changes in standard of reporting.

efore the effect of the reduced incidence on the tage level of susceptibility can be assessed, it is ssary to ascertain whether the reduction in incidence lies equally to all age-groups. The system of reportı to Metropolitan Boroughs in pre-war epidemics, ending as it did on information drawn from school horities, health visitors, doctors, &c. did not adeıtely cover the preschool ages, and the age-distribution icated was correspondingly curtailed at very young s. With this fact in mind the relative numbers at h age in the typical epidemic of 1935–36 (London nty Council 1938) are compared with the distribution notifications in 1945–48 as follows:

e-incidence of measles (% of total no. of children aged 0–14 yr.)

	0–1 yr.	1–3 yr.	3–5 yr.	5–14 yr.	Total
ases reported to M.O.H.s of Metropolitan boroughs, Nov. 1, 1935 to Aug. 31, 1936	4	18	33	45	100
otifications 1945–48	6	29	27	38	100

No definite conclusions can be drawn from these ıres, but the impression is strong that the difference tween the two distributions arises mainly from the vitable under-reporting at ages 0–3 years in the 35–36 epidemic under the arrangements then operative. the absence of any conclusive evidence to the contrary must accept the reduction in post-war incidence as ıng fairly evenly spread over all age-groups.

Unless there has been an increase in what Stocks and ırn (1928) call latent immunity, a general fall of 20% the attack-rate would imply that in passage through h year of age an infant's risk of being attacked has llen by this fraction, and at any age the chance that he she has been attacked has fallen by about 20%.

The lessened incidence has been operating for almost e whole of the past ten years, and one may therefore sume that in the present population of children under e age of 14 the proportion attacked has fallen by 20% the pre-war level up to the age of 10 years and beyond ıat age by a smaller fraction corresponding to the ıngth of pre-war exposure. We may estimate, by pplying this assumption to the sample "history of ttack" figures above, that the *average* level of usceptibility, or proportion of what Hedrich (1933) alls "intacts," has risen from 43 to 50% at least, ınd that before a winter outbreak it has recently een about 55%, an "explosive" level by pre-war tandards.

This change needs explanation, and with it the concomitant feature which is also mysterious, the disappearance of the biennial rhythm.

BIENNIAL RHYTHM

The biennial swing in the incidence of measles observed in pre-war years was not peculiar to London but was observed in most towns in the northern hemisphere. As an example we compare the figures of reported cases in New York with those in London in 1921–48. Both sets of figures involve a degree of approximation, in that they depend on the completeness or otherwise of notification in the two systems of reporting; this factor is, however, reasonably constant from year to year. In London, where for continuity we have used cases reported from schools (the disease did not become notifiable until 1938), an additional error is introduced by the fact that over most of the period it is impossible to separate the rubella figures, which are therefore included for comparability purposes in a composite total *throughout*—we believe this error to be insignificant, but we have no precise measure. The data are represented in fig. 2 (the measles notifications in England and Wales have been added as a background). The diagram shows the following facts:

(1) In both cities there is for the most part a series of alternate heavy and light years, one year being mainly covered by an epidemic and the next being mainly interepidemic.

(2) The two towns "change step" at irregular intervals, and therefore their epidemics sometime occur simultaneously and at other times do not.

(3) Since 1940 New York has maintained the pre-1940 rhythmic pattern, except that since the heavy epidemic of 1941 (a year later than expected) incidence has been generally lighter. In London the post-1940 pattern is quite different from that of pre-war years, each year containing a greater or lesser outbreak of epidemic nature but never attaining the proportions of a pre-war peak. From fig. 2 and the more detailed curves shown in fig. 1 it is clear that it is impossible to speak of biennial epidemics in London after 1939, and that any discussion of two-year periods, as if they included major and minor phases of a biennial cycle, is straining the statistics.

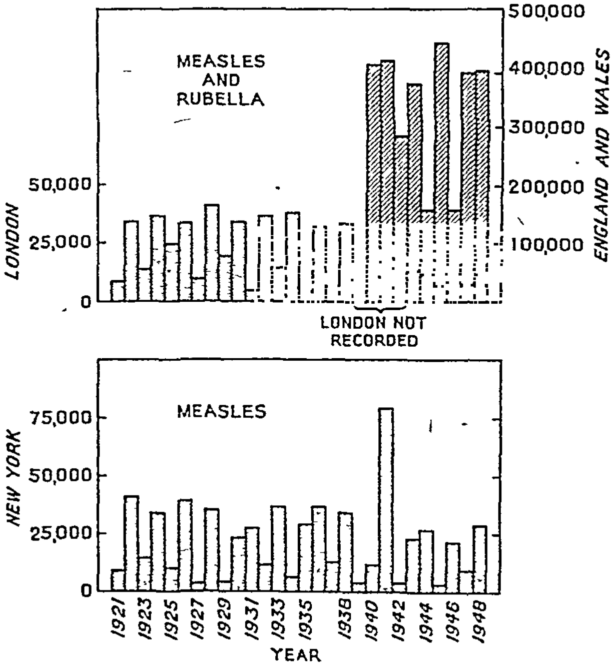

Fig. 2—Biennial rhythm of measles (shaded area, England and Wales).

Public Health

MEASLES IN LONDON

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ANY attempt to compare the incidence of measles in London during and after the war is made difficult by the fact that measles did not become generally notifiable in the County of London until October, 1938, and only one year of notification, and an interepidemic year at that, preceded the outbreak of war in September, 1939.

For estimating the number of cases which would have been notified if general notification had been in force (as under the existing regulations) before 1938 there are our independent sources of information:

(1) Measles was notifiable before 1938 in some London areas, and reference to these records indicates the level of incidence in London as a whole.

(2) Cases of measles coming to the notice of school authorities have always been recorded, and for the period from 1939 to date these records run concurrently with statutory notifications; by gearing notifications to school reports we can estimate the number of cases which would have been notifiable before 1939 if the notification order had been in force.

(3) Over a short period of stability in admission policy, hospital admissions also provide a guide to incidence. The details of these methods are shown in the Appendix, and the results are given below.

(4) If the pre-1939 case-mortality trend can be assessed, the recent movement of the ratio of notifications to deaths might be extrapolated and the series of ratios applied to deaths to yield the corresponding "notifiable" cases.

The results obtained by these methods of estimation are as follows:

ESTIMATES OF NOTIFIABLE CASES OF MEASLES. LONDON ADMINISTRATIVE COUNTY

—	I Local notifications (St. Pancras)	II School reports (× 2·5)	III Hospital admissions (× 8)	IV Based on case-mortality	V Final estimate 1931–38. Actual cases 1939–48
1931	12,000	7500	..	11,000	10,000
1932	80,200	83,750	..	82,200	80,000
1933	12,200	25,000	..	10,800	15,000
1934	101,800	95,250	96,300	99,300	98,000
1935	3360	6750	6200	2600	5000
1936	83,200	79,000	102,300	86,500	85,000
1937	17,860	10,450	13,800	4000	15,000
1938	65,400	79,300	74,300	53,400	64,000
1939	Measles generally notifiable				1303
1940					5447
1941					11,039
1942					19,987
1943					22,882
1944					7499
1945					23,518
1946					22,517
1947					17,486
1948					30,367

Up to the 36th week of 1949 the total cases notified numbered 28,126, and the curve has now descended.

The values of column IV are in many cases too low in non-epidemic years, presumably owing to the fact that in these years of mild prevalence the actual case-mortality is lower than the average deduced from epidemic and non-epidemic years combined. On the whole the various estimates are fairly close. The figures of the final column represent an arbitrary choice after reviewing these independent estimates. The two doubtful years are 1933 and 1938, when the figures based on school reports are much higher than other estimates. Pro since the ratio notifications to school reports was at the end of 1938, it was less than 2·5 over the w year, and the same error probably applies in l In making the final estimates for these two years sc reports were ignored.

The figures in column V have been distributed in fo weekly periods from 1936, and the four-week le are represented as ordinates of the curve shown fig. 1.

POST-WAR INCIDENCE

The important point must be made that in colum of the foregoing data the figures are intercomparable far as the standard of reporting is concerned. the calculations of incidence are based on methods

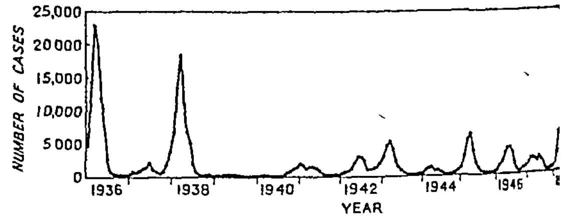


Fig. 1—Incidence of measles in London Administrative County 193 notifications in four-week periods 1939-48; "notifiable" cases 193 annual totals as estimated in text and spread over year in propor to distribution of cases reported from schools.

assumptions that yield estimates of the number of ca which would have been notified if the *same standard* notification had been in force before 1939 as subsequent

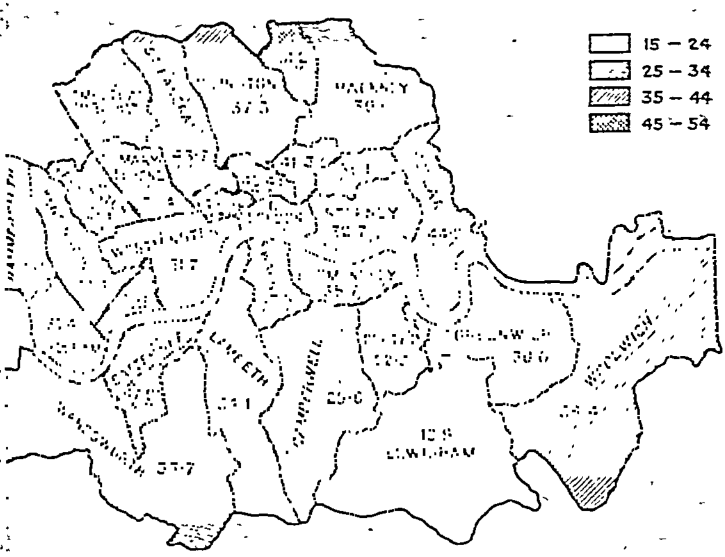
Taking an even number of years to explain the bienn rhythm in pre-war years, and excluding years wh evacuation was operating extensively, we obtain t following comparison of the average level of incidence:

Years	*Average population aged 0–14 yr.*	*Average annual no. of cases*	*Average annu cases % of average population*
1931–38	874,000	46,500	5·3
1945–48	578,145	23,472	4·1

The average incidence over the last four years is th only 80% of expectation.

The proportion of patients over the age of 15 years small; in 1945–48 it was only 2·5%, and we may ther fore assume that a "notification"-rate in the age-grou 0–14 for 1931–38 was about 5·2% annually, and tha ignoring the progressive reduction in survivors, mortality, between birth and the age of 15, about 78 (15 × 5·2) of children would have been notified having had an attack of measles before attaining t age of 15. This agrees reasonably well with the calcul tions of Stocks and Karn (1928) based on St. Pancra *leading to the suggestion that the pre-war position* London was that on the average 70% of the populati had had measles before the age of 10 years. It agre also with the past history relative to measles of a samp of patients admitted to L.C.C. infectious-disease ho pitals in 1938 for treatment for diseases *other tha measles*—i.e., as regards measles their history mig be expected to be typical of the general population.

Age	*Number in sample*	*Percentage with history of measles*
0–	587	2·7
1–	447	16·1
2–	406	27·8
3–	365	41·1
4–	268	53·7
5–	268	62·3
6–	236	70·3
7–	177	71·2
8–	137	76·6
9–	127	61·4
10–14	301	74·1
15–	1466	40·4



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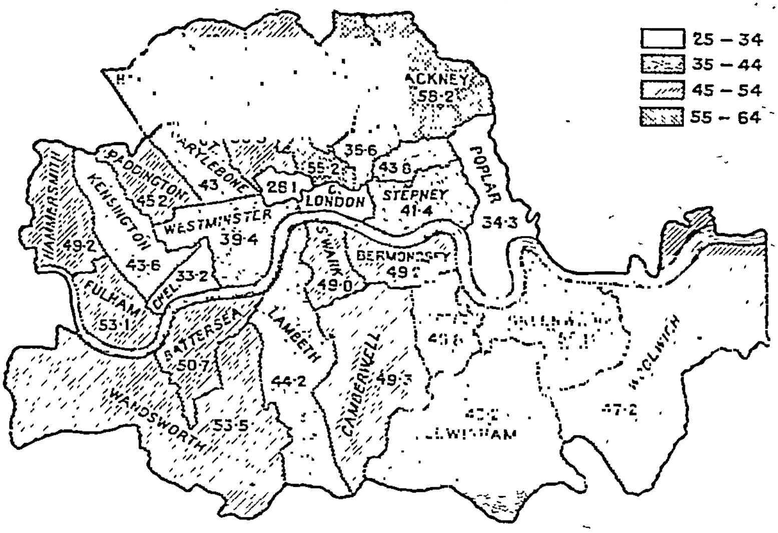

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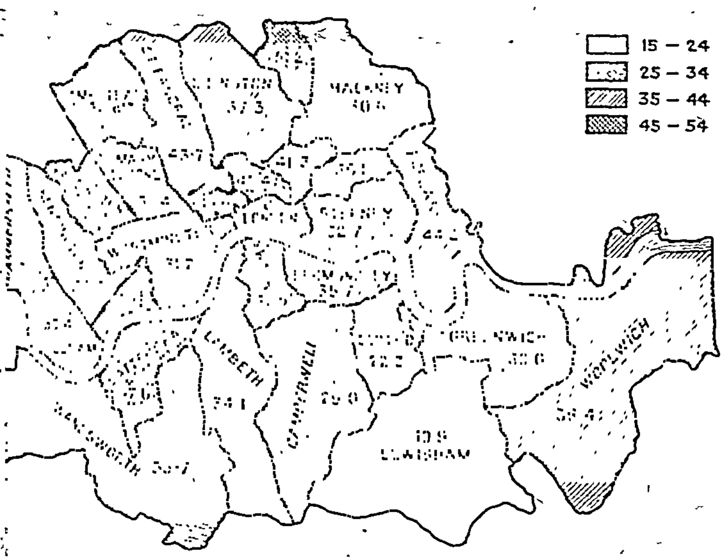

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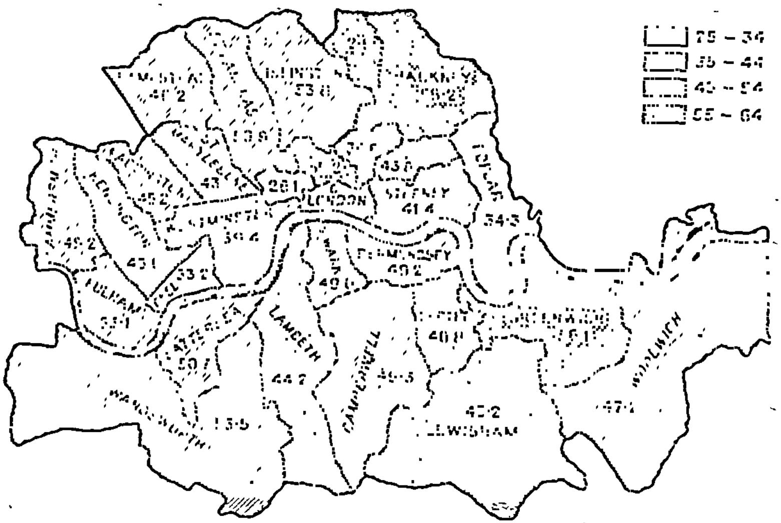

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SUMMARY AND CONCLUSIONS

e incidence of measles in London since 1940 is sur- l and compared with that of the nine years 1931–39. o important observations emerge: (1) the biennial mic rhythm has disappeared, at least temporarily, 2) the over-all incidence has significantly declined. e relationship of these findings to current epidemio- l theories is discussed. The possible influence t is briefly considered.

is concluded that no satisfactory explanation of the gs has been, or is likely to be, forthcoming until er studies of the measles virus have been made and able test for measles immunity has been devised.

wish to thank Sir Allen Daly, county medical officer alth, for his encouragement and valuable criticism.

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Poliomyelitis

uring the week ended Sept. 17 notifications in gland and Wales were: poliomyelitis 311 (284), oencephalitis 31 (22). These are the highest weekly res recorded this year. Figures for the previous week shown in parentheses.

ultiple cases (poliomyelitis and polioencephalitis ether) were reported from the following counties: don 41 (31), Berkshire 7 (4), Chester 4 (6), Cornwall (3), Devon 5 (5), Dorset 3 (5), Durham 7 (7), Essex (16), Gloucester 15 (10), Hertford 4 (5), Kent 16 (9), caster 29 (38), Leicester 13 (7), Lincs, Kesteven 5 (2), cs, Lindsey 7 (1), Middlesex 25 (19), Norfolk 3 (1), [illegible]). Northumberland 10 (8), Nottingham [illegible] 8 (3), Southampton 10 (15), Stafford [illegible]). Sussex, East 2 (4), Warwick 10 (10), [illegible] orks, East Riding 5 (4), Yorks, North [illegible] s, West Riding 33 (25), Glamorgan 3 (7).

n 1947 the total figures for the corresponding week e poliomyelitis 572, polioencephalitis 42; and in t year this was the week in which the fall in tifications began.

Treatment of Smallpox

In the September issue of the *Monthly Bulletin of the inistry of Health and the Public Health Laboratory rice*, Dr. D. F. Johnstone and Dr. J. L. Fluker suggest following scheme of treatment for confluent and morrhagic smallpox: (1) not less than 0·5 mega-unit penicillin should be injected intramuscularly at least ur times daily; (2) when the vesicles become umbili- ted or their contents turbid, 1 g. streptomycin should administered intramuscularly each day, and the daily se of penicillin should, if necessary, be increased to 5 mega-units; (3) streptomycin should be continued r about a fortnight, or anyhow till the lesions have ecome well dried; and the penicillin until the majority f the scabs have separated. With discrete or modified uptions streptomycin would seem unnecessary: but, o reduce suppuration, penicillin should be given in out half the above dosage for a fortnight or so.

In England Now

A Running Commentary by Peripatetic Correspondents

As the congress season closes I find, to my regret, that there was one to which I was not invited. "The Doctors, Friends of Wine" met under distinguished patronage in Bordeaux.[1] (I have in the past assisted at symposia in places so remote as Crewe Station and Calcutta whose activities might have deserved this title; but, somehow, we never thought of it at the time.)

Œnotherapy was the keynote of the Bordelaise gathering, and the conclusion, "that wine is the best weapon with which to fight alcoholism," hints at homœopathy too. Other credit lines for grape-juice were its phosphorus content (and no-one, as far as I can learn, suggested match-heads as a substitute); its internal use by all French athletes of the front rank: and—wait for it—its powers of sterilisation when added to water of doubtful purity. I am indeed glad to know that this old wife was there to tell her oft-told tale. Was not the traditional valour of the poilu supported by the huge horse-drawn tun, good for morale and a precaution against typhoid? In spite of personal experience of vintages which would kill *Salmonella typhi* as surely as Mrs. Knox's sherry would burn the shell off an egg, I fear that this short way with bacteria must join chalybeate springs and the monaural stethoscope in the tail-pocket of a frock-coat. Quite bluntly, I suspect this congress of being no more than a most enjoyable occasion to boost the wine trade, and I sympathise with those of our French colleagues who have regretted its publicity, the more so since there are parts of France where alcoholism is still the problem which it was here fifty years ago. But if I am mistaken, and the purpose of the organisers was the encouragement of œnophily among the faculty, I would make so bold as to suggest that for those of us whose invitations went astray they adopt the traditional method of distributing samples. My choice is two dozen of Ch. Ausone 1924; magnums will do.

* * *

Your Peripatetic may well be right to suggest there is no overdose for Art Therapy. But I know of one absolute contra-indication. The clinical picture goes something like this: "Hello, going painting today, Daddy?" "Fathead, Daddy can't paint. He just mucks about with paints." "Anyway, I'm coming with him. I feel just like a bit of painting." "So do I." (*Rep.*, up to size of family.) "We'll want some of your paper, Daddy." "I can't fix my paper down." "Have you got a pencil, Daddy?" "Will you sharpen my pencil?" "Oh! bother, my water's upset, can I have some more?" "Hello, what's that supposed to be, a rock?" "Silly fathead, its a cow; even Daddy isn't as bad as that." "You've nudged me and made me smudge," "No I didn't." "Ow, stop pinching," "I've finished." "Good lor, call that a picture." "I've drawn a wizard speed-boat in mine." "There isn't a speed-boat there." "I've drawn a tank-landing craft." "Can I have some more paper, Daddy?" "Come on Daddy, and play beach cricket."

In twenty years' time, if I last that long, I'm hoping to try the effects of art therapy. But then I have no doubt it will be: "Hello, going painting today, Grandad?"

* * *

"It is the country doctor who is taking the place of the parson as the skilled grower of plants. There is something about the profession of medicine which peculiarly fits a man, if he can only find the time, to become a good gardener." The operative words may now be "if he can only find the time." However, those who are already gardeners will certainly enjoy Dr. Denham's amusingly written, sound, yet sceptical book.[2] My only quarrel with it is that he knows too much. Should you think of planting willows for winter effect, you can imagine him saying "Do you intend *Salix vitellina, S. britzensis, S. cardinalis, S. decipiens, S. purpurea* or

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1. *Manchester Guardian*, Sept. 15.
2. Th[illegible] By HUMPHREY DENHAM, D.SC. [illegible] Pp. 224. 10*s.* 6*d.*

of the virus to multiply and establish itself on fresh hosts was suddenly increased. These powers, exalted by rapid passage, mounted to a maximum, until as a result of increasing resistance or other factors the impetus of the attack died down and the epidemic subsided.

How do these theories meet the facts of the present situation ? It must be accepted that the purely statistical hypotheses seem inadequate. In London today the ratio of susceptibles to immunes (1 : 1) stands at an appreciably higher figure than it stood for many pre-war years (0·75 : 1). If an epidemic of measles depended solely on a purely mathematical relationship of this sort, it is only reasonable to expect that we should have had a really large epidemic at any time during the past few years.

Stocks and Karn's (1928) theory, if novel, is reasonable and attractive, and it is to some extent in line with modern views and work on other diseases, such as diphtheria and poliomyelitis, but it does not explain the present situation satisfactorily, unless we are to postulate that latent immunisation has been progressing on a much wider scale since the war than the proponents of the theory themselves envisaged. Their theory is open to several serious objections. First, it does not tally with hospital experience. In ward outbreaks (London County Council 1933), for example, it not infrequently happens that a child may withstand three successive exposures to measles at fortnightly intervals, only to succumb to a fourth. It is difficult to see how this could happen if the latent immunising mechanism envisaged by the theory were in operation. Again, why should active immunity, acquired by repeated exposure or subclinical attacks, sufficient to withstand an average infecting dose of virus disappear so rapidly, seeing that immunity, as established by a clinical attack of measles, is normally so solid and durable ? Indeed, why should not the latent immunising process resume where it left off in the next epidemic, at least as often as it breaks down, to consolidate immunity, and thus produce a far higher percentage of persons who escape measles altogether ? In the case of poliomyelitis, during epidemics of which we believe a comparable mechanism to operate, the proportion of those who develop paralytic attacks at any time is infinitesimal compared with those who escape. In measles the situation is reversed. Panum (1846), in the celebrated epidemic in the Faroes, estimated that 99% of the population was attacked, and Paterson (1882) quotes Gudmunsson as giving a similar percentage for the epidemic in Iceland. Hedrich (1933) exhibits a composite graph, based on the work of Butler for Willesden ; Henderson for London, Ontario ; Collins for four United States cities ; Sydenstricker for Hagerstown, Md. ; and his own work in Baltimore, to show that 95% of children have developed measles by the age of 15, and Stocks (1949) has estimated that by the age of 10 years 70% of the children in St. Pancras have had measles. It is therefore understandable that hitherto the host-parasite reaction in measles should have been regarded for the most part as an example of the all-or-nothing law, the host either developing an attack in response to infection or exhibiting no reaction at all. But, even if we concede Maxcy (1948) his 5% of "subclinical" immunes in preference to the concept of "natural" immunity (to account for the 5% who never develop a clinical attack), it seems that the concept of temporary immunisation, neatly as it would solve our difficulties, must be regarded with considerable reserve until work with the virus, including a satisfactory test for susceptibility or immunity, has made the necessary progress.

The same must be said of the theory of virus variation which Stocks (1928) has dismissed, though he postulates as an essential prerequisite to outbreaks sudden fluc tions in apparent infectiousness, which could not wholly explained by immunity changes (as could ensuing course of the epidemic) and must be attrib to changes in facility of transmission. It is true virus variation may too readily be invoked to exp anything and everything, but it is surely as logical regard this increased "facility of transmission" function of the virus, accelerating the dynamic infection, as of equally vague meteorological fact as Stocks has done. Wells's (1944) demonstra of the close correspondence between the "closed-win period" of reduced ventilation and the peak of mea prevalence in the United States appears convincing, would explain the occurrence of a winter epidemic w susceptibles were abundant ; but these conditions h recurred every winter since 1940, whereas mea epidemics on the scale expected have not. Never ind were windows more tightly closed than in the ar weather and fuel shortage of the first three month 1947 ; overcrowding was acute, susceptibles w abundant, and the infection was present, but no epidemic materialised in London. We reserve opinion, remembering that strain-variation is w known among those viruses already sufficiently studied variola major and minor, poliomyelitis, infective hepati and influenza. To assume that only one strain of meas virus exists, or that all strains yet to be identified w exhibit a common level of infectivity, seems to unwarranted.

Possibly yet another factor may enter into t calculation—the widespread improvement in ch nutrition that has taken place since 1940. In gene the nutritional state of the individual has not be shown to exert any appreciable influence on the dete mination of virus infections. The evidence is scant, but such as it is it tends to show that virus, as an oblig cellular parasite, is sometimes more likely to attack th well than the poorly nourished. This was exemplified b the deaths in the pandemic of influenza in 1918, and ha often been noted as regards poliomyelitis in the U.S. Indeed there is suggestive evidence to show that th poliomyelitis virus will not attack the central nervo system in some hosts unless certain B-group vitamins a present in the neurones (Rasmussen et al. 1944, Lichst et al. 1946). Foot-and-mouth disease in cattle is a we known example in which the better the animal's nutr tional state the more likely it is to be attacked (Green 194 On the opposite side of the account there is the exampl typhus, a rickettsial disease, in which, by common con- poor nutrition is regarded as a predisposing factor, an rickettsiæ are now known to share many of the chara teristics of virus. As regards measles, however, it is fa to say that nutritional state has never been shown t exert any influence on the likelihood or otherwise of a attack, and its pre-war universality, whether in publi private, or elementary schools, or in slum distric compared with better-class residential suburbs, reinfor this conclusion, which is borne out in the regressio analysis mentioned above, and as follows, where th difference is not statistically significant :

	Notifications per 1000 of childr up to the age of 14 1945–47
Boroughs with a nutritional standard :	
above average (*a*) ..	3·37 (s.e. 0·025)
below average (*b*) ..	3·12 (s.e. 0·036)

(*a*) Seven boroughs with less than 5% of children graded a school inspections as nutritionally subnormal.

(*b*) Five boroughs with more than 8% of children graded a school inspections as nutritionally subnormal.

Finally, the experimental administration of vitamins A and D to measles patients in 1934 had no significant effect (Mackay et al. 1936), suggesting that measles patients are not subnormally nourished.

after he has been pushed down "the slippery slope leads to the department of psychiatry"!

is really amazing how little some patients know it their "case" after prolonged stay in hospital: it commonplace to discover an abdominal scar whose er does not know what was done at the operation. man who leaves his car at a garage for repairs ılly insists on knowing what has been done before he s the bill. But the hospital patient has never had feeling that he pays the bill, in any sense; he has ays received medical treatment as a sort of charity.

ven now, as I observed afresh when I was recently a ient in a general surgical ward, his attitude towards medical staff is one of almost feudal humility—he ıld never dream of calling them to account for their ıgs. At most, his self-assertion is sulky, truculent, perplexed. He feels defeated before he starts any test, for it is THEIR hospital; THEY make all the rules he is only there on sufferance.

is doubt and uncertainty is, of course, further eased by anxiety: the fear of some terrifying positive wledge makes him readier to accept vagueness or porising on the part of his doctors, and he may also ıtally repress or falsify information they give him if s too painful to contemplate. To have one doctor marily responsible for him throughout his stay in pital would tend to minimise these fears, for a good port would more easily be achieved.

f the patient were not so often treated by "birds of sage," he would be less liable to become, himself, a d of passage from department to department, and m from hospital to hospital.

ondon, W.1. F. R. C. CASSON.

SIR,—While entirely agreeing with Dr. Lipscomb's me that there is often a failure of medical coordination handling patients who come to hospital, I do not think at all his remedies should be accepted.

He suggests that it should be the first assistant's duty reassure the patient. Should this not be the duty of e chief under whose care she is supposed to be? Is t his reassurance and explanation likely to be far more vincing than that of anyone else, and cannot the tient reasonably expect to hear direct from him? And it not utterly deplorable if the only contact she has th the chief is on one occasion when this "important ntleman visits her with great ceremony and a numerous inue"? If he does no more than this, should he not e up the pretence that she is his patient?

Dr. Lipscomb's statement that "if he [the clinical assis-nt who first saw the patient] could not make a diagnosis the evidence available in the outpatient department, s duty was to admit the patient to hospital for further estigation" should also not pass unchallenged. Why ould someone with symptoms of the kind being con-dered enter hospital at all? Even if it is not thought at many of the investigations done on these patients, ch as gastric analyses and, as a rule, cholecystograms, e quite futile, why cannot they all be done in the tpatient department? Does not the very fact of the atient's being admitted suggest to her that she must ave something seriously the matter and thereby direct er to "the slippery slope that leads to the department f psychiatry"?

Farnham, Surrey. J. W. TODD.

THE EMPLOYMENT OF ELDERLY PERSONS

SIR,—Your leading article of Sept. 10 mentions the importance of activity in the aged. Dr. Sturdee (Sept. 17) says that in the investigation of the most suitable forms of activity and employment for elderly persons, general practitioners, district medical officers of health, and factory medical officers can make the most valuable contributions. Probably studies in this field may bring benefits as far-reaching as those that have resulted from the work of school medical officers in the field of preventive pædiatrics.

Although the aged sick in hospital form only a small proportion of the aged community, the opportunities in hospital for continued observation and the availability of occupational therapy allow those caring for these people to make some suggestions. The incentive to recovery in the aged sick with their long-term illnesses is often absent, yet without an incentive all medical efforts directed towards their rehabilitation are futile. Occupational therapy of the diversional kind helps many to forget their disabilities, but the prospect of a future spent in making articles of the "arty-crafty" type can hardly provide a sufficient inspiration for the patient's further existence. Occupational therapy must therefore be developed along vocational rather than diversional lines, and the patient should be taught a job which he can usefully carry on after his discharge from hospital. Vocational training is successfully applied to the rehabilitation of the younger disabled person, but little has been done in this direction for those suffering from the disabilities of old age. In considering the occupation most suitable for the aged patient, there must be coöperation between hospital doctors and local employers. In this way the type of work available can be ascertained and those patients suitable for this work selected. One example of employment which can be learned in hospital and carried on after discharge is the assembly from component parts of small mechanical articles; boxes of components are collected from the factory and their assembly is paid for on a piece-work basis.

We must, however, always remember that while there are some for whom a design for employment is possible, there are others for whom old age brings enforced leisure. Whether this leisure becomes an intolerable burden or a source of happiness depends largely on individual education and the variety of interests acquired during a person's working life.

University College Hospital
(St. Pancras Hospital),
London, N.W.1.

G. S. CROCKETT
A. N. EXTON-SMITH.

FOREIGN BODIES IN THE ABDOMEN

SIR,—There is a widespread belief in medicine that unusual cases will present in a series of two or three within a short time of each other. Mr. Travers's article in your issue of Sept. 10 was noted with interest and the following case is reported because it was seen so soon afterwards.

The patient, a woman, aged 63, was admitted to hospital on Sept. 15 with a history of acute colicky lower abdominal pain for some thirty-six hours. The pain continued in spasms, particularly if any fluid or solid food was taken. There was no nausea or vomiting. Within a few hours the pain spread over the lower abdomen as a constant ache and subsequently became generalised.

On admission the general condition was excellent. The breath was normal and the tongue clean. The abdomen showed the signs of a general peritonitis with maximum tenderness below the umbilicus. In view of these findings, a diagnosis was made of peritonitis of unknown cause and laparotomy was carried out through a right paramedian incision.

A small amount of seropurulent fluid was found on opening the abdomen. The appendix and the uterus and appendages were normal, but on examination of the small bowel some loops which were brought out of the pelvis were found to be covered with purulent exudate. The sigmoid colon was palpated and a sharp object was felt projecting through the medial wall near the apex of the sigmoid loop. With retraction the area was visualised and the foreign body was seen to be a fish-bone. The paramedian wound was closed and a left oblique muscle-splitting incision made and the colon with the foreign body delivered externally. It was impossible to withdraw the bone through the perforation and the colon was opened, the bone removed, and a Paul's tube inserted.

S. daphnoides ?" But don't be put off—you can work off his knowledge on your friends. One minor department of gardening has been omitted from his chapter on garden tools: he has said nothing about the application of the tools of other disciplines to gardening. In my household nearly all the kitchen implements disappear into the garden—gravy strainers, sieves, carving forks, kitchen scissors, and spoons all gravitate to the gardening trug. The double saucepan is useful for sterilising small quantities of earth; and I recommend the steak tongs for people who are squeamish about picking up those long black slugs which pullulate after rain. Recently I came into a small legacy which included the very out-of-date implements of a surgically minded practitioner. Of course the scissors, scalpels, forceps, and the like were accepted with joy, but I'm puzzled to find a use for a laryngoscope. I don't grow pitcher-plants. Perhaps other Peripatetics have found the answer? And obstetrical forceps? Anything doing with vegetable marrows?

* * *

Whenever a policeman on point-duty raises a minatory forefinger at me and halts my car, I wonder whether I should have been let past if I had one of those DOCTOR windscreen labels. He might think I was dashing urgently to operate, à la Walter Mitty, on a case in which Corcopsis had set in.

On the other hand, such a label might render me liable to be stopped for any and every minor road casualty, and give me the embarrassment of admitting that I'm only a psychiatrist, not a *real* doctor, and it would surely stimulate car thieves to ransack my car for phenobarbitone.

What I should really like would be an assortment of rear-window signs, controllable from the dashboard, which could be flicked into view p.r.n. There are so many occasions when one would like to flash a message to the driver behind: sometimes apologetic, "Sorry I cut in"; sometimes curt, "No use your hooting!"; or, simply, "Temper!"

* * *

After six months of Casualty in a London hospital, I resolved to take my students for a farewell session at the local. It was disconcerting to find a preponderance of total abstainers—the explanation offered was that most of the Demob Types had burnt themselves out in the Forces. The remaining 10% had a small ulcer on his lesser curve which he nursed with tender care. We finally repaired to the milk bar down the road, where we chatted softly together of this case and that, until chairs were stacked on all the other tables and we reluctantly dispersed.

We had spoken with reverence of Mrs. A., whose chest was always settling on her stomach—it was her husband who died of Hogskin's disease; he had attended for a long time with Gastric but they never diagonised him. Of old Miss B, who was always full of wind which came out continually through her left ear, and was only too willing to dilate on the horrors of her miscarriage, which apparently occurred at two and a half minutes. And there was the brisk housewife who wanted some M & B's for her chicken which had the diarrhœa. It was in Casualty, too, that my test for neurosis—the Raving Matrices—was first used successfully. This consists in listening to the patient talk for fifteen minutes, after which you take your own temperature. A rise of 0·6°F or more puts the issue beyond doubt. The sweet young refugee who said she had been working in Hungary as a typewriter was rapidly followed by the elderly gent who had the blood-pressure every half-hour. "I am feeling very middling indeed," said a third, "I take confection of senna, but it hangs about in my neck." Lastly there were the notes made by my irritated predecessors at the end of the day and their tether, such as "Delighted to say he is worse. O.E. much better"; or this tribute to the vis medicatrix naturæ: "May '46, terrible headaches, impossible to live." "June '46, still alive."

When I retire from the fray, somewhat pottery in the legs, when I have written my last certificate for Natural Health and prescribed my last Peninsular Tablet, these are the memories *I* shall take out of medicine.

Letters to the Editor

SEEING THE PATIENT THROUGH

SIR,—Would Dr. Lipscomb, I wonder, accept an ame ment to his thesis? It is that the hospital's duty is really to see Mrs. A through but to help Dr. B to her through. It is this which, in my experience, hospi find so very hard to do.

Dr. B has, of course, reciprocal duties which h unlikely to recognise unless he feels the patient to be own, and which he cannot perform without time perform them in. Time he must have, to take a pro history and to talk to Mrs. A, and he must pro unceasingly until he gets it; but, given only this ti three obligations appear to rest with him: to ref from calling in the hospital if history plus consult room examination can yield a diagnosis; to explain Mrs. A, if he sends her, what he is asking of the hospi and what, in round terms, she may expect there; and write the hospital a letter.

The last two of these duties are far more diffic than the first. Both are relatively easy if he can se Mrs. A to a physician and a hospital he knows well, b this cannot always be done. Consultation clinics wi named physicians attending at published times are ve helpful, but even then the physician is not always th on the day and sometimes the patient must be se simply to a hospital, when it may be hard to know whom to write. It would be a help if the appropri authority would tell us precisely what hospital offi will receive our Mrs. A and the letter we send with h

Dr. Lipscomb deals faithfully with the next part the story, painfully familiar from the lips of patient and we come to chapter III, the patient's return. It less common than it was to get no report at all; b it is still common to get none for many weeks, a a human letter to balance the human letter sent wi the patient is really rare. I think it is getting rare because the report usurps its place.

Dr. Lipscomb's sketch report is quite typical. I sends Dr. B's heart into his boots and makes hi ashamed to face his patient. It implies in every line tha Mrs. A is a mere aggregate of bodily mechanisms a that to grant her a mind or personality, unless by calli her "a somewhat neurotic type," would be a betray of medical science. It attempts no positive answer t the problem of her symptoms. Mrs. A and Dr. B lo sadly at each other. "Of course everyone was v kind"; but the consultation has been a failure and sh must start again.

But the failure is not a failure to "see her through Dr. B wanted her back and we may hope she wished t come back to him. He called in the hospital as a co sultant and collaborator, and the conscientious who "has Mrs. A up again," as though she were no his patient, forgets that pretty piece of etiquette where the consultant enters the bedroom last but leaves first. Dr. B will see her *through*. It is his job and no-o else can, or should try to, do it for him. But there w a point at which he needed such *help as only the hospit* could supply, and the hospital has not *understood* t nature of the problem and has missed its chance.

Dr. Lipscomb suggests that hospitals and *practitione* should get together, and that is indeed something a getting together of hospital doctors, family *doctor* and experienced patients—all being *homines bo* *voluntatis*—would be more than something.

LINDSEY W. BATTIS

London, N.W.3.

SIR,—The dubiety created in the mind of the averag hospital patient by the medical incoördination D Lipscomb describes is, alas, often *realised only by tho* dwellers in the infernal regions who have to deal wi y criticisms are mainly directed against London, less against the provinces. The causes for this of balance and proportion in selecting cases are erous, and many are charged with great emotion. criticism raises outbursts of indignation, some ified, some not. The causes do not lie entirely with hospitals but partly with those who send patients to n.

EIDON.

R,—We read a great deal these days about suggested ses in general practice and even about the formation hairs in general practice. Some even go so far as to e that general practice is not taught to graduates or ergraduates and call for a commission of inquiry. sonally I attribute such lines of thought to the times which we live: some are not happy unless they note a course for this, that, and the other. But ly it is the personality of the doctor that makes nars his calling. Do the advocates of courses really eve that these, per se, will transform an unsatisfory practitioner into a conscientious, a tolerant, and eloved family doctor?

verpool, S. JOHN R. MACINTYRE.

RESEARCH

IR,—Your leading article of Sept. 3 stated that had not yet heard of a board of governors of a ching hospital using the free funds at their disposal the promotion of research. At University College spital the board of governors have allotted a block nt of £5000 for the provision of a metabolic unit, and addition they have asked the medical committee to mulate a scheme for utilising a further grant of £5000 annum for research purposes.

niversity College Hospital,
London, W.C.1.

T. F. W. MACKEOWN
Administrator and Secretary.

CHLOROMYCETIN IN ENTERIC FEVER

IR,—By a happy coincidence a little chloromycetin ame available simultaneously with the admission to s hospital of 4 cases of enteric fever. The effect of s drug was in each case immediate and incontestable.

ASE 1.—A baby boy, aged 18 months, was admitted on ne 15 this year with a three-day history of high fever and vulsions. The abdomen was distended; scattered rhonchi re heard over both lungs; and the fauces were injected. nicillin 25,000 units was injected four-hourly; and the t day sulphadiazine 0·25 g. four-hourly was added. lture of stool was negative for the typhoid group; and on 18th blood-culture also proved negative. On the 20th, wever, blood-culture yielded *Salmonella paratyphi-B*.

On the 21st all other treatment was stopped and chloroycetin, mixed with a little sugar and sour milk, was begun doses of 0·125 g. four-hourly. Twenty-four hours later the tient's general condition was much improved; on the rd stool-culture revealed no organisms of the enteric group; d on the 24th urine-culture was negative. On the 27th e Widal reaction was positive 1 : 125 for *S. paratyphi-B*. n the 28th chloromycetin was stopped, altogether 4·5 g. ving been given.

On the 30th the parents removed the child from hospital. n July 20 he was reported well, and stool-culture was gative.

CASE 2.—A boy, aged 5 years, was admitted on June 27 ith a history of fever for the past ten days. Two days reviously the Widal reaction had proved positive 1 : 50 for . *typhi*. The spleen was enlarged two fingerbreadths below he costal margin; roseolæ were numerous over the abdomen nd sparse over the chest and thighs.

Chloromycetin was begun in three-hourly doses of 0·125 g. By the 28th the general condition had improved and the roseolæ had faded. On the 30th blood-culture yielded *S. typhi*. On July 3 the patient was convalescent, and chloromycetin, of which altogether 5·75 g. had been administered, was stopped. On the 4th the Widal reaction was reported positive 1 : 125 for *S. typhi*.

On the 7th the patient left hospital. Cultures of blood, urine, and stool were now all negative for the enteric group. On the 23rd the child was reported well; stool-culture remained negative.

CASE 3.—A man, aged 45, was admitted on July 16. Fifteen days previously he had vomited and since then had been feverish: for the last four days the stools had contained dark blood. The patient was very toxic and distressed, and since the diagnosis seemed certain chloromycetin was begun immediately in doses of 1 g. hourly for four hours and thereafter 0·5 g. four-hourly.

On the 17th his general condition was improved. On the 18th the Widal reaction was found to be positive 1 : 25 for *S. typhi*. On the 22nd urine-culture was negative. By the 24th the patient was convalescent; there had been no melæna since the second day of treatment. Chloromycetin was stopped after a total of 22 g. had been given. On the 26th stool-culture revealed an organism with all the characteristics of *S. typhi* except motility, which was impaired.

On the 29th the patient, saying that he was cured, insisted on leaving hospital. On the 30th stool-culture proved negative for the enteric group. On Aug. 1 he was reported to be well: blood-culture was negative.

CASE 4.—A boy of 12 was admitted on July 25 on account of high fever and prostration which had been evident for the past week. Prostration was extreme, and the spleen was enlarged three fingerbreadths below the costal margin: there were no roseolæ. On July 26 blood-culture proved positive for *S. typhi*.

On the 27th chloromycetin was started two-hourly in amounts of 1 g. for the first three doses and of 0·25 g. thereafter. On the 28th his general condition was much improved. On the 29th blood-culture was positive for *S. typhi*: stool-culture was negative for the enteric group. On Aug. 1 urine-culture was negative; the Widal reaction was positive 1 : 250 for *S. typhi* (*H*). On the 2nd blood-culture proved negative; the spleen was much reduced in size. By the 4th the patient was convalescent; chloromycetin was stopped, altogether 20 g. having been given.

On the 5th the spleen was only just palpable and stool-culture was negative; the patient left hospital.

In each of these cases improvement with chloromycetin was immediate and sustained; in case 3—a severe one that without chloromycetin would have caused anxiety for weeks—the melæna was arrested within forty-eight hours.

In Syria enteric fever is endemic and often very severe; in both children and adults hæmorrhage and perforation often caused death despite immediate hospital treatment. Unfortunately the price of chloromycetin is at present almost prohibitive.

Altounyan Hospital, Aleppo, Syria. Y. KILEDJIAN.

SIR,—Two cases of typhoid fever have lately been treated with chloramphenicol ('Chloromycetin') at the Government Isolation Hospital, Amman.

CASE 1.—A girl, 12 years old, weighing 45 kg., was admitted on Aug. 6, having been ill for the past thirteen days. She was stuporose, and clinically her condition was typical of toxæmic typhoid fever; the Widal reaction was positive. Chloromycetin therapy was started on Aug. 8 (the fourteenth day of the disease) with 2·25 g. followed by 0·25 g. two-hourly until the patient became afebrile, after four days. Then 0·25 g. was given four-hourly for five days. The total dosage was 17 g. The patient was discharged cured on Aug. 22, and so far no relapse has been reported.

CASE 2.—A girl, aged 18 years, weighing 30 kg., was admitted on Aug. 4, with a history of nine days' illness. The clinical diagnosis of typhoid fever was confirmed by a positive Widal reaction. Chloromycetin therapy was begun on the 7th—the twelfth day of the disease. The effect was not as dramatic as in the first case; the temperature took longer to become normal, but improvement was apparent. The initial dose of 2·5 g. was followed by 0·25 g. two-hourly until the temperature was normal on the 19th—after twelve days' treatment, compared with four days in the first case. For the next five days 0·25 g. was given four-hourly. The total dosage was 49 g. After a further six days' observation, the patient was discharged on the 24th. So far there has been no relapse.

DJAMIL FAIK TUTUNJI
Amman the Jordan. Under-Secretary of State for Health.

The bone was found to measure about 2 in. long expanding at the base to $^1/_2$ in. wide. The immediate postoperative period has been satisfactory and the temporary colostomy will shortly be closed.

A detailed history taken from the patient after operation shows that she had eaten some plaice about five days before the onset of the pain. Her lower dentures were uncomfortable and she had left them out for that particular meal and believes it was easily possible for her to have swallowed the bone without noticing it. In view of the size of the bone it is surprising that it could negotiate the narrow terminal ileum. The sigmoid loop was much less mobile than normal and this may have been the cause of perforation at this level.

Central Middlesex Hospital,
London, N.W.10.

C. F. CHAPPLE
W. B. MCGOWAN.

SIR,—The *article* by Mr. Travers (Sept. 10) *and his* request for further reports prompts me to record the following two cases:

CASE 1.—On Dec. 31, 1943, a woman, aged 57, was admitted to hospital complaining that five days previously she had had sudden onset of acute upper abdominal pain, which had steadily become worse. On admission her temperature was 101·2°F; pulse-rate 104 per min., blood-pressure 85/60 mm. Hg. Examination revealed epigastric rigidity and tenderness, and on pelvic examination a severely eroded pessary was removed, accompanied by fæcal discharge. The signs indicated an acute inflammatory lesion in the upper abdomen, and the primary site of infection was thought to be in the pelvis.

At laparotomy, after careful preoperative treatment, a high right paramedian incision was made, and on opening the abdominal cavity a grossly œdematous falciform ligament presented. The right side of the liver and the gall-bladder appeared normal, but to the left of the falciform ligament the liver was plum-coloured. On dividing the falciform ligament an abscess cavity about $1^1/_2$ in. in diameter was opened and typical *Bact. coli* pus escaped. The exploring finger palpated a sharp object on the right wall of the abscess, which on removal was seen to be a portion of a rabbit rib. This measured $1^1/_2$ in. in length; the sharp end was bevelled, giving it the appearance of a bent aspirating needle. The abdomen was closed with drainage without exploring the pelvis. Postoperatively there was much discharge, but recovery was uneventful and the fæcal fistula healed spontaneously.

Of particular interest is the fact that the patient volunteered that two months previously she had had a similar attack of acute abdominal pain which was intensified on any thoraco-abdominal movement, particularly flexion. Presumably this was the time when the bone perforated the pylorus. In the few days before her admission the patient experienced the same postural intensification of pain. The description she gave was convincing.

CASE 2.—Early in January, 1944, a woman, aged 35, was admitted with acute right-sided abdominal pain. The clinical picture was not clear and a provisional diagnosis of acute cholecystitis was made with subsequent expectant treatment. The patient had been admitted some months previously for an abortion, which was dealt with without incident, but one physician noted at that time that the spleen was palpable. During the days of observation the consultant surgeon was asked to see the case, but no definite diagnosis was made. The liver became palpable and gradually increased in size, eventually reaching the right iliac fossa. The patient aroused considerable interest among the medical staff and many investigations were performed with normal results. However, on further careful questioning the patient gave the information that the pain was intensified on movement, particularly flexion. Up to this time laparotomy was considered unwise, but in view of the case already described the many radiographs were re-examined and revealed the distal half of a broken pin or needle lying on the deep surface of the anterior abdominal wall. Laparotomy followed, with a provisional diagnosis of hepatic abscess.

At operation the metallic body was found on the deep surface of the rectus abdominis, and *just deep to this on* opening the abdominal cavity the free margin of the liver *showed a triangular scarred area* $^1/_2$ in. across the base. was excised. On further exploration the right side of liver was seen to be almost filled by a firm, rounded, mass lightly attached on its upper surface to the surface of the diaphragm. The mass was explored number of places with a wide-bore aspirating needle, but pus was located. The abdomen was then closed with givings as to the wisdom of operation. The spleen enlarged and soft. After operation the patient made uninterrupted recovery, and the liver regressed and fin disappeared under the costal margin. Subsequently she seen regularly and six months later was perfectly well.

The patient remembered after operation that at age of 10 she fell over and a pin on the carpet penetra the abdominal wall, but it gave her no trouble and quickly forgot the incident. The histological report the excised portion of the liver stated that the specim consisted of scar tissue with chronic inflammat changes around a central focus consistent with presence of a foreign body.

London, N.11.

R. F. HENDTLASS.

THE FIRST MEDICAL EXAMINATION

SIR,—Dr. Johnson's plea (Sept. 17) "for a mo searching consideration of the nature of the standard of the 1st M.B. examination would have some valid if the medical schools could absorb all who pass examination. My daughter was successful in the Lond external 1st M.B. examination this year but has be unable to obtain a place to continue her studies eith in London or the provinces. She informs me that th are dozens in similar plight.

Truro.

V. E. WHITMAN.

WHY NOT GENERAL PRACTICE?

SIR,—Your leading article of Aug. 27 touches fundamental points. Very little, however, is said abou immediate changes which could be made without adjust ment of the curriculum or new appointments to th staff.

A large number of disorders encountered in gener practice in themselves rarely necessitate admission hospital. Many of these complaints, however, arise patients seen in hospital, and too little is done to brin the notice of students to them. Mild neuroses, bronchit fibrositis, headaches, and mild hallux rigidus and oste arthritis are probably some of the commonest. The must be taken into consideration anyway if the pati is to be treated as a whole.

There are, however, a large number of very importa conditions commonly seen in general practice whic often need hospital treatment. For various reason some of these conditions are gradually being exclude from undergraduate teaching hospitals. Acute abdomin conditions, abortions, severe chronic bronchitis an emphysema, cerebral thrombosis and hæmorrhage, an pneumonia are examples of these complaints.

Medical undergraduate education has two functions academic and vocational. An undergraduate teachin hospital also has two functions: it has to serve the societ in its neighbourhood, and it has to provide means fo medical education.

Cases are being selected to serve this academic function of medical education to the detriment of the vocational From the point of view of the function of a hospital cases are selected too much to suit sectional and individual interests, too little regard being paid to the needs of undergraduate education and even to the prime function of a hospital, which is to serve society.

The changes over the last thirty years have been so gradual that they have not been fully appreciated. There is much truth in the statement that the be places [illegible] students now are the former when a management committee, to avoid publicity, 's to settle a case and looks to the doctor for a ibution towards the cost of settlement. The interests e doctor, however, may demand that the case should ught in open court for the vindication of his good e and reputation. Such conflicts of interest have t occurred in cases where the Service authorities municipal bodies have been involved, and the medical nce societies know how to handle them.

Obituary

J. TYLOR FOX

M.A., M.D. CAMB., D.P.M.

r. Tylor Fox, who died on Sept. 20, aged 64, had ked for over thirty years on epilepsy, and especially the daily life and employment of epileptics. He ntained that the social handicap of this disease is of all proportion to the physical handicap, and that based largely on public misconceptions which can must be removed. He did much to create a more eful and understanding outlook.

member of the Society of Friends, he was the son of R. Hingston Fox, F.R.C.P., biographer of Fothergill. He was sent to the Friends' schools at Ackworth and Bootham and to the City of London School, from which he won a scholarship to Sidney Sussex College, Cambridge. Qualifying from the London Hospital in 1910, he held a house-appointment at Ipswich and then spent several years in general practice in North London. Next, in 1916, he went to Russia as chief medical officer of the Friends War Victims relief expedition to a famine area.

[Elliott & Fry

"His aim," writes J. R., "was to establish on the remote steppe a hospital of as high a standard as circumstances permitted, and he endured with fortitude and his own quiet humour the many modifications of his ideal which conditions demanded. He would not have been so successful with the peasants if he had not won their affection as a man and their respect as clinician. It was not easy to convince them of the value of modern sanitary requirements, and to persuade them that illness was not a visitation of God's displeasure proved even more difficult.

"On his return to England his report on the war morale of the people late in 1917 was received by High Authorities with incredulity, because it did not coincide with those of the diplomats. But events proved that he was right; reports usually are when based on direct observation. He was, besides a clinician of the individual, a good observer of the masses."

In 1918, soon after coming back, Fox visited the Lingfield Epileptic Colony to help in an emergency; and he remained, as medical superintendent, until 1945. Established in Surrey by the Christian Social Service Union as a home for unemployable epileptics, the colony was already taking children, with the help of grants from local authorities. Under Fox's care it grew steadily larger and became fully self-supporting: by the beginning of the late war it had the biggest epileptic school in the country, with about 250 children, and some 200 adults also had their home there. But despite its size, it still contrived to have something of a family atmosphere; and this was due not least to the medical superintendent. He was very conscientious, taking pains to know every patient; and "when Dr. Fox speaks to you," said one of them, "you feel as though you matter." His particular blend of caution, solemnity, and humour, and the knowledge of his solid kindness, pleased the Lingfield population as it had pleased the Russians. He had integrity without either hardness or self-esteem. He was at the same time a wise physician, and also a keen investigator who was always ready to test any promising method of treatment and to put the resources of Lingfield at the disposal of outside workers. His own clinical contributions included papers in our columns on phenobarbitone (1927) and, with Dr. Gwenyron Griffiths, on rhythm in epilepsy (1938). Though the war brought to Lingfield many difficulties, culminating in flying bombs and evacuation, it also saw some valuable advances on the occupational side. "Occupation and interest," said the superintendent, "are direct anticonvulsants."

When diminishing health obliged Fox to retire from Lingfield in 1945, he was glad of the chance to do more in the campaign for the better care of epileptics. Though generally reserved in manner, and sometimes shyly formal even to old friends, he could speak well and write well; and he had something important to say.

"Until the week of his death," writes D. J. W., "he was working for the social and economic improvement in the lives of epileptic people. He was in touch with clinical neurologists, electrophysiologists, and pharmacologists, but his real interest was in the social field and his work was complementary to theirs. Personally, and in such offices as president of the British branch of the International League against Epilepsy, he was influencing public bodies towards enlightenment in the education, employment, and care of epileptics. His paper on the Social Aspects of Epilepsy, published in THE LANCET in 1947, expressed the aims of that work.

"He was most quiet and retiring; he did not often speak at medical meetings, nor did he write much, although he had great experience of the sheltered epileptic. His choice of epilepsy as his main interest in medicine was fortunate, for his qualities matched a great need. A social reformer must have patience, and it is certain that much that Tylor Fox worked for has still to be done. But he has left behind organisations and enthusiasms to continue the work. Those he cared for in his years at Lingfield are only a few of those he will have helped."

His interest in epilepsy, however, was by no means exclusive. His other public work included membership of the London committee of the Lebanon Hospital for Mental Diseases, and for two years he acted as its chairman.

Dr. Fox married, in 1912, Elsie, daughter of the late Edwin Gilbert, and she survives him. He leaves three children; and in his elder son, already a doctor, the family has reached its seventh medical generation.

GEOFFREY COMMELINE WILLIAMS

O.B.E., M.A. OXFD & CAMB., M.R.C.S., D.P.H.

Dr. G. C. Williams, senior administrative medical officer of the Oxford regional hospital board, died on Sept. 21 at the age of 57. Born at Thornbury, Gloucestershire, where his father was in medical practice, he was educated at Clifton College, Caius College, Cambridge, and Bristol Royal Infirmary. After qualifying in 1916 he served overseas as a captain in the R.A.M.C. for two years, and on demobilisation he became assistant medical officer to the Bristol city fever hospital and sanatorium. In 1921 he took the D.P.H. and in the same year he went to Oxford as assistant medical officer of health, later becoming deputy M.O.H., and in 1930 M.O.H.

Already an M.A. of Cambridge, in 1937 he took his M.A. Oxfd by incorporation, becoming a member of Brasenose College. In 1942 he was appointed O.B.E. for his services to public health and to civil defence. Formerly an examiner in public health in the University of Oxford, he was also a past chairman of the Oxford and district public medical service, and a member of the committee of the Nuffield Institute of Social Medicine, and of the council of the medical staff of the United Oxford Hospitals.

W. S. writes: "Men like Billy Williams can ill be spared in these days when so much hinges on a fair and equitable administration of the new health services. A first-class administrator, he always tended to approach problems from the human side rather than from the point of view of regulations and orders. He was perhaps at his best in times of stress, when his calm and equable

Medicine and the Law

Death after Measles Immunisation

An inquest on the deaths of three children, which was adjourned on Sept. 20, was resumed on Sept. 26. These children, all aged 3 years and a few months, died of acute hepatitis some 7 weeks after the intramuscular injection of serum given on July 1 to immunise them against measles. At the request of Dr. Bentley Purchase, the coroner for St. Pancras, Dr. F. E. Camps described the post-mortem findings in two of these three cases. Both showed advanced liver necrosis, the condition being slightly less severe in one child. He had no doubt from the evidence, he said, that the liver damage was due to the transmission of a substance in serum, used in this case for measles immunisation. Virus transmitted in this way cannot be identified until a case of hepatitis occurs. He was satisfied that the syringes were not responsible; several were used, and a large number of children were immunised on the same day. The syringes were changed after every fourth child, and a new needle was used for each child. It seems that the four children who developed hepatitis (one is still ill) were not injected in succession but were scattered through the whole group treated; it is therefore improbable that the same syringe was used for each of them. It is very unlikely, Dr. Camps said, that the virus would be transmitted by a syringe used for intramuscular injections; contamination is usually the result of intravenous injections, in which a little blood is drawn back into the barrel before the injection is made. The four children infected, with one other child who has not developed jaundice, all received serum from a single batch, only a small quantity of which was used. At the previous hearing, Dr. R. A. Zeitlin, director of the Tottenham blood-transfusion department, said that of the sixty donors who had contributed blood to this batch of serum, five had had jaundice in the past, but all many years ago, well beyond the period within which it was thought to be dangerous.

Dr. Alfred Piney said that pathological examination confirmed that there was severe necrosis of the liver, of the type which occurs with virus infections.

The coroner, summing up, recalled that the three children who died had, with many others, been given the injections at a day nursery, because they were thought to be measles contacts. This method of immunisation is well established, not new, and one local authority has practised it for years without the appearance of any such cases. Of the sixteen children immunised that morning, the five who had the same batch of serum were scattered through the group. Three died and one was ill. Hepatitis shows itself within 60–100 days. It was no fault of the method, he said, that three children died: the danger of infection by hepatitis virus through a serum injection is no greater when the serum is given to protect against measles than when it is given for some other reason. He was satisfied by the evidence of Dr. J. Harrington, who gave the injections, and Dr. Zeitlin, who has charge of the laboratory where the serum is collected, that there had been no sort of neglect or lack of care. The experience gained from these unfortunate cases might be of practical use in serum immunisation, in the future, but that was not the province of his court. He was satisfied that the deaths were due to injections of serum given in July, and he brought them in as deaths by misadventure.

The Wrong Cylinder

In Dublin District Court last week, the judge rejected the prosecution's case against a house-surgeon charged with having unlawfully killed a patient who died while under an anæsthetic.

At earlier hearings and in a previous statement the house-surgeon had testified that on May 30 she decided
to administer nitrous oxide and oxygen to an outp
for the purpose of operating on a septic thumb.
the house-surgeon, noticed that the oxygen c
on the apparatus was empty, and she asked a n
get a full cylinder; she did not check the c
brought by the nurse but tightened it up and tur
the nitrous oxide fully and the oxygen partly
noticed that the patient was becoming cya
and she then turned the nitrous oxide off and the
fully on. The patient became still more cya
and it was found that both cylinders contained
oxide. Oxygen was administered from a fresh
two intracardiac injections were given, and a
respiration was begun and was continued for som
without success. In cross-examination the
surgeon said that she knew that one or other
nitrous oxide or oxygen cylinders had a white t
she did not know which.

For the firm supplying the cylinders it was stat
those containing nitrous oxide and oxygen wer
distinctively marked; but nothing in the ap
used was to prevent interchange of the two cylin

District Judge Mangan found that the State
established that the house-surgeon had failed
care and that death had been due to that failure.
had been default by the accused, but the pros
had not shown that death had resulted from the
The possibility of death from other causes had n
excluded; there was no evidence that a post
examination had been made.

Legal Proceedings in the N.H.S.

A memorandum lately circulated to boar
management committees *indicates that the*
Health is anxious to be kept out of legal p
against hospitals. The proper course for a
solicitor is to institute proceedings against the
ment committee or the board of governors.
appropriate, the management committee shoul
assistance from the solicitor of the regional
board. The Ministry should be consulted in cases
ing the construction of the Act and the regulat
cases where an application is being threatened f
to apply for a writ of mandamus, and in cases in
legal questions of first-class importance.

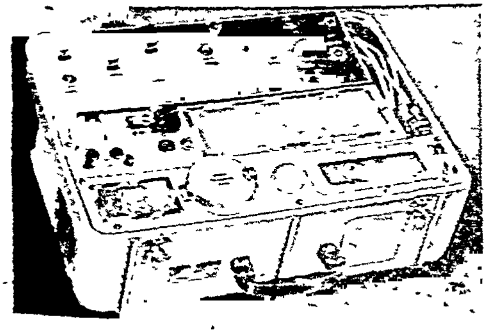
Where a claim is based on negligent treatme
nurse, it is to be expected that the claim will be
her employer, and the nurse will not be made a
defendant. *If, however,* the nurse is joined
proceedings, the employer is authorised to see
defence if she so desires, and in such cases the
acting for the employer would normally act
defendant nurse as well. Where, on the other ha
nurse has acted quite outside the scope of her au
the Ministry holds that she ought to be left to
her own defence. Though it is stated that suc
should be referred to the *Ministry for consid*
nothing is said about whether a nurse conduct
own defence would also be expected to pay for
looks as though she would. If so, nurses may wel
that the time has now come when they should
defence organisation like those that have p
members of the medical and dental professions fo

The memorandum points out that, generally sp
"authorities are not authorised to undertake the
of hospital doctors who may be sued in respect of
negligence,"; if it is sought to make an authorit
for negligent acts of a doctor, it should normal
such steps as are open to it under the Law
(Married Women and Tortfeasors) Act, 1935, *to*
a contribution from the doctor in respect of d
that may be recovered. This makes it clearer th
that every doctor and dentist should *have* m
providing for their own defence. There may well b

s now termed—who took charge of treatment might also nder the medical officer of health in connexion with reventive aspect. The major difficulty now facing the culosis service was to ensure coöperation between the 1 officers and the hospital service; the hospital clinician tend to look at the patient in the hospital bed but to n, as it were, unconscious of the dire needs of the patient le. The tuberculosis officer now had more fully at his sal the resources of the hospital service; and he still ned the head of the tuberculosis service, under the istrative control of the medical officer of health for ions other than actual treatment. One or two local rities were failing to pull their weight; a few seemed ve adopted the mistaken attitude that the bulk of the had passed to the regional board and that they need ery little. Some might be tempted to have a cynical d for the word "coöperation"; but the administrative ture must be assumed to have some permanence, and on sense freely dictated that the various services must together. In all this the health officer and his invaluable the health visitor, had, as in all diseases of social rtance, a major part to play.

DIRECT-RECORDING ELECTROCARDIOGRAPH

NEW electrocardiograph, marketed as model 1314 by rs. A. C. Cossor Ltd., incorporates an electronic amplifier, h, in combination with an inkless two-speed recording provides a direct permanent record by the passage of lectric current through sensitised paper. The normal tivity of the instrument is 1 cm. per millivolt, which is generally accepted standard. One 150-ft. roll of calibrated rding paper is sufficient for 30 minutes' continuous running ld occasion demand. The instrument is completely mains-en and is stabilised against reasonable line voltage fluc-ions. Either of the two recording speeds of 2½ cm. per and 10 cm. per sec. can be selected during a recording a switch-operated automatic gear-change mechanism. nexion to the patient is by a plastic-coated, four-core, ened cable, which separates into four individually marked l coloured leads with pin connectors to the sprung contacts stainless-steel electrodes. The chest electrode, which can detached for cleaning, is operated by a pressure bulb, and tact is maintained pneumatically. For adjustment of the n, a lens is fitted into the window above the recording ms. A multiple switch is incorporated to give standard ds 1, 2, and 3, the C.R. lead, and the "Wilson indifferent trode" as well as augmented unipolar tracings. In its the instrument weighs about 50 lb. and is no larger than mall suitcase.



Dr. T. S. Stone writes: "This electrocardiograph has been use at the Ramsgate and Margate General Hospital for three nths and has proved very satisfactory. We have direct-rent mains here, so a small converter has to be used and s gives excellent results with no interference. Equally good ults are obtained in parts of the town supplied by alter-ing current provided that the mains supply is adequately rthed. The machine is really portable and seems able to thstand a reasonable amount of rough handling. The method f direct recording makes it possible to give an opinion immedi-tely at the patient's bedside; moreover, a continuous tracing an be taken almost indefinitely—a valuable aid in disorders f rhythm. The switch that increases the motor speed four times, and so gives the effect of a slow-motion record, has also proved useful in cases of tachycardia. The apparatus is easy to use. The one-knob control that enables standard, chest, polar chest, and augmented limb leads to be obtained by pressing a button is simplicity itself."

DISTRIBUTION OF GENERAL PRACTITIONERS

THE following further amendments have been made to the Medical Practices Committee's classification of executive-council areas described in our issue of July 30 (p. 211). The first list of amendments was published in our issue of Aug. 20 (p. 355). Schedule 1 contains the names of parts where more doctors are needed; Schedule 4 of the "closed areas."

Schedule 1

CORRECTION

Glamorganshire.—Neath should read Neath Municipal Borough.

Schedule 4

ADDITIONS

Carmarthenshire.—Pontyates, Trimsaran.
Glamorganshire.—Dinas Powis, Radyr.
Cumberland.—Silloth.
Devon and Exeter.—Roborough, Sampford Peverell, Bere Alston, Chagford, Hemyock, Ipplepen, Torrington (Great), Whimple, Lewdown.

DELETION

Devon and Exeter.—Chudleigh.

STREPTOMYCIN SUPPLIES

HITHERTO the use of streptomycin in Great Britain has been mostly limited to controlled studies. Owing to increased production, from Nov. 1 it will be generally available on prescription. Announcing this, the Ministry of Health states that the only continuing administrative controls over this antibiotic will be those imposed by the Therapeutic Substances Act, and by the Penicillin Act which makes its procurement subject to medical prescription. The Ministry urges that streptomycin should be used "only in conditions, or to combat infections, in which its efficacy is known . . . the proper place for the experimental trial of this antibiotic in unusual conditions is the hospital, not the home." Its two main disadvantages are: (1) toxic effects, which may be permanent; and (2) the evolution during treatment of strains of the infecting organisms which have developed a resistance to streptomycin. Adequate doses should be given from the start, and sometimes it may be preferable to give larger doses than usual for up to one week, since serious toxic effects do not appear to develop within that period. "In any case, if the expected therapeutic response is not obtained in that time, reconsideration of the treatment is indicated." The Ministry statement denies that the substitution of dihydro-streptomycin for streptomycin itself would reduce the risk of toxic sequelæ.

PUFFING AND BLOWING

THE child-health and medical illustration departments of Guy's Hospital have published a four-page card of "Special Breathing Exercises for Children," in which simple devices for expanding the lungs—blowing a ping-pong ball, keeping a feather in the air, blowing soap-bubbles, and distending a balloon—are described and illustrated. The intention is that children with chest complaints should keep the card on the mantelpiece at home and do the exercises there. It is a good idea and the card is quite nicely done; but with a little more thought it could have been done even better. Children old enough to read the directions for themselves will think some of the pictures rather babyish; they will also be puzzled to come across the word "abdomen" in the otherwise simple text. Moreover, one may doubt whether the title of the card, which appears in large letters at the top of the first page, will win the coöperation of a young person who is already bothered by his breathing and feeling out of things because of it. Anyone who was required to do "special exercises" for anything in childhood will recall how humiliating it was. But the principle is thoroughly sound, and this is only a first edition of the cards: later editions will no doubt improve on it. Meanwhile this is a useful beginning, and those needing the cards for distribution can get them from the hospital at a cost of 9*d*. each, 33*s*. for 50, £3 for 100, and £25 for 1000.

CARDS FOR A GOOD CAUSE

THERE is a story in the Grenfell family that Sir Wilfred once met a lady on a boat, and after a week's acquaintance asked her to marry him. "But you don't even know my name!" she exclaimed in surprise. "What does that matter?" he demanded; "it'll soon be the same as mine"; and so it was. In the same spirit of happy confidence he carried through his work in Labrador. The fishermen who lived there in isolated hardship must have doctors, nurses, and hospitals he decided; and soon they had the Grenfell Mission extending along a thousand-mile coastline, ice-bound character shone forth conspicuously. His discreet and tactful intervention at committee meetings many times smoothed out what might have developed into an awkward situation. His motto could well have been Service before Self, and even his intimate friends did not always know how much help he gave to those in trouble.

"Williams was a man of the highest integrity and all with whom he came into contact soon recognised this quality. While M.O.H. for Oxford his relations with the general practitioners were particularly happy. He had few hobbies, but until he became absorbed in civil defence duties he enjoyed a round of golf.

"He spent the last days of his life in the Slade Hospital, a modern institution for infectious diseases, for the construction and planning of which he was largely responsible."

Dr. Williams married, in 1919, Irene Mary Durant, who survives him with one daughter.

HARRY SMITH

M.R.C.S., D.P.H.

Dr. Harry Smith, who died on Sept. 16 at the age of 48, was one of the nine divisional medical officers appointed to administer the local-health-authority services of the London County Council.

After taking the Conjoint qualification from St. Bartholomew's Hospital in 1924, he held resident appointments in hospitals in Rugby and London, and worked in general practice from 1926 to 1931. He looked back on these five years, spent in rural practices in the West of England, with particular affection, and he used to say that the intimacy of the personal contacts lent general practice a quality unattainable in other branches of the profession.

For two years he was an assistant school medical officer at Plymouth, and from 1934 assistant M.O.H. at Portsmouth. His experiences in these provincial appointments were part of the equipment which made him so valuable when he joined the London service in 1938. His first work in London was in the slum-clearance programme which before the war was a large and important part of the health department's functions. During the war he undertook varied duties connected with the school health service, the medical examination of staff, and first-aid training. He was promoted to divisional medical officer in 1941 and principal assistant medical officer in 1946.

Dr. Smith took up his post as divisional medical officer in April of last year, and his charge included Chelsea, Fulham, Hammersmith, and Kensington. A colleague writes, "His energy, his skill in health administration, and his ability to get on with all kinds of men, women, and, above all, children eased the process of establishing the new structure. His wide knowledge of the law and practice of public health and his ready adaptability to new circumstances quickly gave him a high reputation among his colleagues, the members of the divisional health committee, and the wide section of the population with whom he came into contact."

Appointments

BUTTLE, R. L., M.R.C.S., D.P.M.: psychiatrist, Fulbourn Mental Hospital, Cambs.

CHRISTIE, A. L. M., M.B., PH.D. Lond., M.SC. N.Z.: second pathologist, Norfolk and Norwich Hospital.

CLARK, G. M., M.B. Glasg., D.P.H.: temporary tuberculosis physician, Glasgow northern hospitals.

MOORE, B. P. L., M.B. Belf.: provincial medical director, British Columbia depot, Canadian Red Cross Blood Transfusion Service.

STEWART, C. J., M.D. Lond., D.OBST. R.C.O.G.: chest physician, Ipswich and East Suffolk area.

Colonial Service:

EVANS, W. J. M., M.B. Lond.: senior M.O., Tanganyika.
HARRIS, F. C., M.R.C.S.: M.O., Gold Coast.
JOHNSON, A. J., M.B. Camb., D.T.M. & H.: senior M.O., Sierra Leone.
LOW, K. N. H., M.R.C.S.: M.O., British Guiana.
MURCOTT, E. H., M.B. Edin., D.P.H.: senior M.O., Kenya.
NUGENT, D. A. W., M.B. Madras: M.O., Gold Coast.
WILKINS, VIOLET, M.B. Edin.: lady M.O., Nigeria.
WINGATE, M. B., M.R.C.S.: M.O., Northern Rhodesia.

Notes and News

EMERGENCY BED SERVICE BRANCHES OUT

DURING last winter applications for the admission of pat were received from doctors and hospitals at a greater than could be immediately dealt with by the office of service at Old Jewry, which was responsible for the whole Greater London. Some accumulation of less urgent ca was inevitable, which caused delays in informing doctors the disposal of their cases and undue strain on the To avoid these delays during the approaching winter, w the approval of the four Metropolitan regional hospital boar branch offices of the service are being opened to deal with outer part of Greater London. The following offices (wi the exception of the south-western branch at Wimbled will open on Oct. 3, and will accept cases from general prac tioners and hospitals in their area from 8.30 A.M. until 9 daily (including Sundays). They will be closely linked w other branches and with the central office at Old Jew During the night a full service for the whole of Greater Lond will be available at the central office.

CENTRAL OFFICE: 10, Old Jewry, E.C.2. (MONarch Covering by day Central London only (i.e., the area not cove by the four branch offices); by night (9 P.M.–8.30 A.M.) the wh of Greater London.

WESTERN BRANCH: 81, Mattock Lane, Ealing, W.13. (EAL 6671.) Covering Acton, Ealing, Hounslow, Staines, Uxbrid Harefield, Northwood, Pinner, Harrow, Stanmore, Edgware, Hill, Hendon, Willesden, Wembley, Brentford, and Twickenham.

EASTERN BRANCH: Road, Leytonstone, E.
(LEYtonstone 6461.) ton, Chingfo
Walthamstow, Leyton, Forest Ga
Plaistow, East and We Romford, a
Epping.

RANCH: Hospital, G
S.W.19.
Norwood,

SOUTH-EASTERN Road, S.E.
(WOOlwich 3471.) wich, Blackh
Lewisham, Catford, Dartford,
Orpington, and Seve admit patients
hospitals in the Bro ring the
group admissions of

The E.B.S. is a purely auxiliary service intended to sa the general practitioner's time, and doctors will of course direct to the hospital if they wish, except for cases of infectio diseases within the County of London. The E.B.S. d not deal with mental cases or with tuberculous cases ot than acute emergencies. The availability of beds during coming winter depends on factors outside the control of E.B.S., but with the help of the new offices it is hoped answer doctors' applications more rapidly than last y Doctors will help by ringing the office nearest the pati home; the full resources of the E.B.S. will be availa through any of its offices.

TUBERCULOSIS IN SCOTLAND

SPEAKING in Edinburgh on Sept. 20, Sir Andrew David chief medical officer of the Department of Health for Scotla observed that tuberculosis remained the black spot Scotland's health record. Scottish experience differed fr that of many neighbouring and similar countries, for favourable pre-war trend, which had been seriously interrupt by war-time influences, had not been resumed as it had el where. The round figures for Scotland were: about 30, cases on the tuberculosis registers; 8000 new notificatio during 1948, when there were 3400 deaths; some 2 patients awaiting admission to hospital; and nearly 5 beds for treatment and isolation, of which nearly 600 w empty and unstaffed. Nevertheless, knowledge justif people thinking in terms of complete control and ev eradication. Already the increase in new cases notif through improved case-finding was proportionately grea than the increase in deaths.

The primary responsibility for the patient at home m rest with the general practitioner; with the need for ca segregation and treatment, the family doctor had in tub culosis a function which was perhaps more important than in a other disease. On the hospital side a double integration w needed: the regional board must be integrated first w the general medical services of the area, and secondly with t epidemiological, social, and environmental aspects of t work. Thus regional boards had been advised that d appointments might in certain circumstances be of permane advantage; the tuberculosis officer—or chest consultant

ACUTE MASTITIS

ANTHONY WALSH
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TE mastitis is an all too common disease which ot had the attention it deserves. Fulton (1945) in dy of puerperal and lactational mastitis in a town ,000 inhabitants found an incidence of nearly 9% deliveries. Breast infection is rarely fatal and n the cause of serious illness, but it is undoubtedly ise of considerable maternal morbidity following irth. The comparative neglect of the subject is n by the fact that from 1940 to 1947 only eight papers is theme were listed in the *Quarterly Cumulative*

the past treatment has been unsatisfactory. Most progressed to abscess formation; indeed many encouraged to do so. When the abscess was judged "ripe" the standard radial incision was made, s were ruthlessly torn to make certain of draining culi, and large rubber tubes were placed in the ting cavity. Often it was a matter of weeks before was final healing, and always there was the fear recurrence; so an infected breast was a calamity he patient and a nuisance to her doctor, not to ion the potential ill to the infant of weaning too . Though, in good hands, the end-result was usually actory, far too often the combination of the disease its treatment left a maimed organ and an ugly

is paper is based on the study of 153 cases of acute itis treated in the wards of Smithdown Road ital, Liverpool, between December, 1945, and ary, 1947. My object was to discover the best s of treating the disease, with the following parti- aims in view: (*a*) rapid control and cure; (*b*) mini- interference with breast-feeding; and (*c*) minimal ing in cases requiring drainage.

ÆTIOLOGY

l but 1 of the 153 patients were lactating or pregnant en. The single exception was a virgin aged 19 with all abscess in the breast for which no cause was d. The relation to parturition of the remaining 152 s is shown in table I.

om this table it will be seen that although there more cases in the second puerperal week than ny others, a considerable number occurred later. aps the most noteworthy point is that over half found at a time when the patient would not nally be in hospital; hence the responsibility for diagnosis and treatment rests with the general titioner.

BLE I—TIME OF ONSET IN RELATION TO PARTURITION

—	Last 6 weeks of preg-nancy	1st puer-peral week	2nd week	3rd week	3 weeks –3 mos.	3–6 mos.	Over 6 mos.
f cases	5	20	46	31	40	7	3
ntage	3·3	13·2	30·3	20·4	26·3	4·6	2·0

has long been recognised that the principal bacterial t in acute mastitis is the *Staphylococcus aureus*. This been confirmed in the present series. Pus was obtained 7 cases, and 51 of them yielded a pure culture of ulase-positive penicillin-sensitive *Staph. aureus*. In tion, 5 of the 57 grew hæmolytic streptococci. In the aining case a pure culture of hæmolytic streptococci was obtained: in this patient there was a considerable abrasion at the base of the nipple and swabs from the throat gave a growth of streptococci of the same type (Lancefield group A). In the 5 cases in which both staphylococci and streptococci were found the streptococcus appeared to be a secondary invader; in all of this group a long incision had been made for drainage, and initial cultures showed only staphylococci. The importance of preventing secondary streptococcal invasion will be emphasised later.

I have made no attempt to evaluate the various ætiological factors involved. Nevertheless, I have been struck most forcibly by the significance of milk stagnation. Borrowing the jargon of the mathematician, I would term milk stagnation the "highest common factor." A well-known predisposing cause of acute mastitis is cracked nipple, which was observed in 31 cases of the present series. In most of these 31 the initial lesion appeared to be a reticular lymphangitis of the subcutaneous tissues with secondary spread to the mammary parenchyma. In the remaining 121 the infection seemed to have entered along the ducts (although blood-borne infection cannot be discounted).

There are three chief ways in which acute mastitis may be established:

(1) Retrograde infection along the ducts to a zone of stagnant milk behind some block. This is analogous to the infection which so commonly follows chronic retention of urine; but milk is far superior to urine as a culture medium for the pathogenic cocci.

(2) Reticular lymphangitis spreading in the subcutaneous tissues from a cracked nipple. The inflammatory reaction causes compression of the nearby ducts with resultant milk stasis. The "pool" of milk is rapidly invaded by the adjacent organisms.

(3) Blood-borne infection of a milk-retention "cyst."

Here we see perhaps the chief reason why acute mastitis is so common in the first two weeks of lactation. Before the flow has been properly established there is a greater likelihood of obstruction by epithelial debris than later when the ducts are kept clear by the frequent passage of fluid. Reference to table I shows that the incidence of acute mastitis does in fact diminish as the duration of lactation increases. Breast infections occurring in later months are most often found when lactation is ceasing, or rather during weaning when the emptying of the breast may not be complete and some residual milk lies in the ducts. (Though a huge abscess was seen in one patient in this series who had been suckling her child for eighteen months and had apparently not even begun to consider weaning.) Again, it is common in a patient with a breast abscess, apparently well on the road to recovery, to see a second or third abscess appear in a part of the breast remote from the original infection, often in the axillary tail. Such secondary abscesses are usually due to the milk retention which is so likely in a breast which cannot easily be emptied completely.

If this hypothesis is correct, then it must be of paramount importance in the treatment of acute mastitis to ensure that the breast is properly emptied of milk, and kept empty. This is abundantly borne out in the present series. Altogether there were 57 cases of abscess formation. In 12 of these, treatment was by simple incision and systemic penicillin, with no special care to avoid milk retention, though in all 12 the child was weaned and stilbœstrol was administered to inhibit lactation: of these 12, 3 developed a second abscess in the axillary tail. In the remaining 45 cases great care was taken to prevent the retention of milk, and lactation was encouraged rather than inhibited. In none of these 45 (all treated by drainage and the same dosage of penicillin) did a secondary abscess develop.

for many months in the year. Now, after more than fifty years of splendid service in this harrowing climate, the hospitals badly need rebuilding and enlarging, equipment needs replacing, and surgical and medical supplies must be maintained.

One way to help with this work is to join the Grenfell Association; subscribers of 10s. a year become associate members and receive the quarterly journal. Another way is to buy Christmas cards from the association. This year there is, in addition to some old favourites, an attractive new card, by Rhoda Dawson, of two Labrador housewives on their way to church, their hands tucked into the sleeves of their white fur sweaters, and their little black-and-white moccasins barely showing under their blue print dresses. A winter scene by Stephen Hamilton also has charm; and a group of husky puppies photographed on a sledge are as confident of approval as the baby pandas they resemble. Seascapes by Cecil S. Ashdown may also be bought, as postcards; and the association runs a stamp bureau for philatelists.

Orders for Christmas cards should go to the secretary of the Grenfell Association, 66, Victoria Street, London, S.W.1; requests for stamps to Mrs. Mackay, 88, Exeter House, Putney Heath, S.W.15.

University of Leeds

The inaugural lecture of the faculty of medicine will be given in the Riley-Smith hall of the University Union on Friday, Oct. 7, at 3 P.M., by Prof. John Cruickshank, who will speak on Medicine Today and Tomorrow.

Royal Medico-Psychological Association

This association's Maudsley lecture will be delivered on Thursday, Nov. 3, at 2.15 P.M., at 1, Wimpole Street, London, W.1, by Mr. W. Grey Walter, SC.D. He is to speak on the Functions of Electrical Rhythms in the Brain.

Faculty of Homœopathy

The presidential address will be delivered at the Royal London Homœopathic Hospital on Thursday, Oct. 6, at 5 P.M., by Dr. Margery G. Blackie, who will speak on the Place of Homœopathy in Modern Medicine.

Hammersmith, West London, and St. Mark's Hospitals

Prof. Ian Aird has been appointed to the board of governors of this group of teaching hospitals in succession to Prof. J. H. Dible.

York Medical Society

The new session of this society will open on Oct. 12, when Sir Henry Cohen, this year's orator, will speak on New Pathways in Medicine.

Vellore Christian Medical College

The annual reception and conference of the Friends of Vellore is to be held at the Alliance Hall, Palmer Street, London, S.W.1, on Thursday, Oct. 6, at 3 P.M.

Adlerian Society of Great Britain

The first meeting of this society's medical section is to be held at 11, Chandos Street, London, W.1, on Thursday, Oct 13, at 8 P.M., when Dr. Neville Murray and Dr. Joshua Bierer will discuss Prolonged Sneezing as a Psychosomatic Symptom.

Chiropody in Scotland

Addressing the Society of Chiropodists in Edinburgh on Sept. 22, Sir George Henderson, secretary of the Department of Health for Scotland, said that his Department hoped to develop a chiropody service in association with health centres; and the Department's first experimental centre—at Sighthill, Edinburgh—would include a room specially earmarked for this purpose. The Department was also considering methods by which a chiropody service could be developed in connexion with groups of general practitioners, in advance of the building of health centres.

Interdepartmental Committee on Registration of Opticians

The Minister of Health and the Secretary of State for Scotland have appointed a committee, under the chairmanship of Lord Crook, to advise, on the assumption that statutory registration of opticians would be to the public interest, how such registration could best be achieved and what qualifications should be required. The medical members of the committee are Mr. G. W. Black, Dr. Macdonald Critchley, Prof. C. A. Lovatt Evans, F.R.S., Mr. John Marshall, and Mr. O. Gayer Morgan.

Manufacture of Thyroxine

The manufacture of *l*-thyroxine on a commercial scale h been achieved by the research division of Glaxo laboratories

Manufacture of Cortisone

B.U.P. reports that at least five American companies trying to synthesise 'Cortisone' are to exchange patents.

Weekend Courses on Rheumatic Diseases

A course is being held at the rheumatism unit of St. Hospital, Fulham Road, London, S.W.10, on Oct. 1 and 2

A course arranged by the Empire Rheumatism Council be held in London on Nov. 18–20. Further information be had from the general secretary of the council, Tavi House North, Tavistock Square, London, W.C.1.

Cinemicrographic Film Library

The Royal Microscopical Society has established a ci micrographic film library for the benefit of univer technical schools, and other scientific bodies. Inqu should be addressed to the assistant secretary of the soc B.M.A. House, Tavistock Square, London, W.C.1.

Prof. J. C. Spence left on Monday for Czechoslova where he is spending two weeks lecturing for the Bri Council.

CORRIGENDUM: *Hyaluronidase in Pædiatrics.*—The ultimate sentence of this annotation on Sept. 17 (p should have read: "The material can be easily prepared fr bovine semen, which may be had in fairly large quantit

Diary of the Week

OCT. 2 TO 8

Monday, 3rd

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's I Road, W.C.1
2.30 P.M. Miss D. J. Collier: Treatment of Facial Paralysis.

Wednesday, 5th

UNIVERSITY OF GLASGOW
8 P.M. (Department of *Ophthalmology.*) Dr. George L Biochemical Aspects of Methanol Poisoning.

Thursday, 6th

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Anthony Feiling: Neurology lecture-dem stration.

Friday, 7th

KETTLE LECTURE
5 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C Dr. Beatrice Pullinger: Significance of Functi Differentiation in Mammary Tumours.

Births, Marriages, and Deaths

BIRTHS

BENSTEAD.—On Sept. 16, at Bradford, the wife of Dr. J Benstead—a daughter.

CARD.—On Sept. 16, in Edinburgh, the wife of Dr. W. I. Card a son.

HOLMAN.—On Sept. 15, at Leeds, the wife of Dr. R. A. Holman a son.

LEVY.—On Sept. 25, the wife of Dr. Norman Levy—a daughter

MCCORMACK.—On Sept. 17, the wife of Mr. J. M. McCormac F.R.C.S.—a son.

POCKLEY.—On Sept. 20, in Sydney, the wife of Dr. John Pock —a son.

SEACOME.—On Sept. 19, at Cheltenham, to Dr. Mary Seacome (n Dalton), wife of the Rev. M. O. Seacome—a daughter.

SHORT.—On Sept. 17, the wife of Dr. R. H. D. Short—a daught

MARRIAGES

HENDERSON—FORREST.—On Sept. 20, in Edinburgh, Theod Lindsay Henderson, M.B., to Janet Taylor Young Forr M.B.

TATLOW—TAYLOR.—On Sept. 17, at Feniton, Devon, William F. Tatlow, M.D., to Anne D. Taylor.

YATES—WALKER.—On Sept. 17, in London, P. C. Yates, M.B., Alison M. F. Walker.

DEATHS

BLAIR.—On Sept. 20, in London, George MacLellan Blair, M.B. Glasg., aged 74.

FOX.—On Sept. 20, Joseph Tylor Fox, M.A., M.D. Camb., D.P.M. aged 64.

FRASER.—On Sept. 22, at Torquay, Frank Fraser, M.D., C.M. Edin aged 92.

GLANVILLE.—On Sept. 15, at Margate, Ruby Ellen Glanvil M.B. Lond.

SUTCLIFFE.—On Sept. 18, at Smitterfield, near Stratford-on-Avon Percy Temple Sutcliffe, M.B. Camb.

THOMSON.—On Sept. 20, William George Thomson, M.A., M.B. Aberd. D.P.H., D.P.M., aged 58.

II—DURATION OF SYMPTOMS AT BEGINNING OF TREAT- T OF THE 84 PATIENTS RECEIVING SYSTEMIC PENICILLIN CONTINUING LACTATION

—	Less than 12 hr.	12–18 hr.	18–24 hr.	24–48 hr.	48–60 hr.
no. of in- ns required	10	14	23	29	35

classical picture of the mature infection. The onset e obvious, with a rigor, pyrexia, pain and tender- the breast. This, however, is by no means the nd it may be very difficult in an early case to ntiate between an infection and the "flushing" milk engorgement which is commonly seen in the eek of lactation. Where the diagnosis is in doubt, tient should be regarded as having acute mastitis : r better that occasionally a mother should have a nnecessary injections than that an infection be time to establish itself before active therapy is This attitude is comparable to the giving of phtheritic serum on the *suspicion* of diphtheria. icillin *is administered early enough in every case,* s formation should never occur.

st observation from this series repeats what has been said in earlier writings. I refer to the value quate support to the inflamed organ so that it is irmly and comfortably slung as high as possible. s undoubtedly a factor of importance in treat- and adds considerably to the comfort of the it.

illary methods of treatment—e.g., with short-wave rmy and X rays—have not been used in this

REATMENT WHEN AN ABSCESS HAS FORMED

peatedly in the vast literature on penicillin we find sistent theme that the use of penicillin is no sub- e for surgery. It has been shown, for example, n the treatment of the septic finger penicillin may resolution if no pus has formed, but once suppura- as set in, the sooner the infective focus is drained oner will the lesion be cured. The same principle true in the treatment of a breast abscess. As soon s has begun to form in the mammary tissue no should be lost in evacuating it. Since the advent sulphonamides and the antibiotics it has been the ice of many people to ply the patient with these until the abscess has "localised," and to wait ps many days before instituting drainage. Such a ice may be harmless enough in a patient with a taneous abscess but it cannot be too strongly mned where there is pus in the breast tissue. astination in the treatment of a mammary abscess esult only in damage, perhaps irreparable, to more nore of the parenchyma.

e need not see many such cases to learn that it is more difficult to obtain a rapid cure when an s involves only part of the breast than when the organ has become a bag of pus. In the latter simple drainage usually suffices without any otherapeutic or antibiotic aid; the condition is ly relieved, though of course the patient has suffered amounts to a functional mastectomy. Why is an s less responsive if there remains any sound breast e? To pose the problem another way: how does a t abscess differ from any other abscess in a relatively icial site? The answer is not far to seek. When bscess is formed, neighbouring ducts tend to become ucted either by the inflammatory process or by lial debris. Such obstruction is followed by the lopment of a milk retention cyst. These lactoceles may be found in many breasts when opening an abscess. Sometimes they are little more than slightly distended ducts, but quite often they are appreciably larger and they may be an inch or more in diameter. These enclosed repositories of stagnant milk are extremely susceptible to infection by direct spread from the nearby focus. The longer an abscess is present and the larger it grows, the more ducts will be blocked, the more "milk cysts" will be formed, and the greater will be the opportunity for invasion of new areas by the offending staphylococcus. If the infection progresses until the entire gland is destroyed, the lesion now differs in no way from any other simple subcutaneous abscess and it responds rapidly to simple drainage.

If early drainage is so imperative, it is important to recognise the early signs of pus formation in an infected breast. *This may not be easy.* In hospital practice the patient is usually not seen until the abscess is obvious; but now and then one encounters the woman in whose breast there is an inflamed indurated zone in which no fluctuation or other definite evidence of pus can be detected. In such cases one should not wait for the appearance of fluctuation; for the abscess has often reached a considerable size before fluctuation is evident, depending to some extent on its depth. Any area of tense induration in an inflamed breast should be regarded as containing pus and drained accordingly. It is in just these cases, with an area of induration rather than a frank abscess, that pain is greatest; and the relief afforded by incision is immediate and should not be denied to the patient. It is not uncommon to meet with cases of mastitis which have been lingering on for weeks under insufficiently vigorous treatment and in which there is a zone of induration which is only moderately tender. These cases seem to be progressing neither to suppuration nor to resolution; the forces of invasion and defence are in a state of uneasy truce. In such patients it is justifiable to observe for a few days the effect of systemic penicillin in a dosage of the order of 50,000 or 100,000 units every four hours. In a few instances a considerable improvement will take place and one may persevere with conservative therapy; but if the zone of thickening is not appreciably less by the third day the breast should then be incised.

In this series 9 patients were seen with a sharply limited sector of inflammation in which could be felt an acutely tender zone of induration. Pyrexia varied from 99·8 to 102·4°F. In the first 4 of these cases I had not realised the necessity for immediate incision, and they were treated with systemic penicillin—50,000 units four-hourly. Within twenty-four hours the temperature had returned to normal and the local signs were appreciably less severe; but after the initial improvement the condition became static and at the end of five days the indurated area was no less. Of these 4 patients 2 were kept on penicillin for eight days and then discharged, but in each some thickening was still present three months later. The other 2 had an incision made into the indurated area on the fifth day: in both, pus was found and resolution was thereafter fairly rapid. The remaining 5 breasts in this category were incised on the first day of treatment and also given the same penicillin dosage of 50,000 units every four hours. All 5 patients were discharged on the fourth day and when seen a week later were cleanly healed with no residual thickening.

Many patients had been treated at home, with sulphonamides or penicillin or both, and were sent to hospital with a note to the effect that "the condition has now localised and is ripe for incision." Alas, the great majority of these were over-ripe. True, many had only a small superficial abscess, but nearly always this proved to be of the "collar-stud" type leading through a

TREATMENT OF SIMPLE ACUTE MASTITIS WITHOUT ABSCESS FORMATION

The series contains 96 cases of simple acute mastitis without abscess. In all of them, as soon as the diagnosis was made, a course of systemic penicillin was begun, the routine dosage being 20,000 units intramuscularly every four hours, continued until the inflammation had completely resolved.

In the first 8, all occurring in the first puerperal week, the infant was weaned and lactation suppressed by the usual methods, including administration of hexœstrol and limitation of fluids. Of the 8 cases, 5 improved rapidly and were considered cured after ten penicillin injections: in all 5 lactation was speedily suppressed. The other 3 are of greater interest as in them the breasts became engorged with milk and had to be emptied with a pump. Though treatment of these 3 was begun at the first sign of inflammation, the response was not nearly so rapid as in the 5 cases where lactation ceased quickly. 2 of the 3 required twenty-five injections before resolution was complete. The 3rd case developed an indurated area in the axillary tail: this did not appear to suppurate but forty injections of penicillin were required before the breast became normal. I suggest that the poorer response in these 3 cases was due principally, if not entirely, to failure to achieve complete emptying with the breast-pump. This thesis is more fully elaborated below.

The criticism may be made that the dosage of penicillin was rather low, and it may be suggested that the 3 patients in whom resolution was delayed would have done better with a larger dosage. This criticism is possibly valid, but it does seem significant that the delayed resolution was in those patients in whom the infected breast became greatly engorged.

The relatively low penicillin dosage has been unexpectedly vindicated in the recent exposition by Eagle and Musselman of the therapeutic importance of the "zone phenomenon." Maximum bactericidal effect on the *Staph. aureus* is achieved by a concentration of about 0·1 unit per ml., and no increase beyond this quite low concentration will accelerate the bactericidal effect. (Since completing this series, I have employed 100,000 *units intramuscularly every four hours as the routine* dosage, for some strains of *Staph. aureus* are relatively less sensitive to penicillin.)

In the remaining 88 cases the same penicillin dosage was used (20,000 units four-hourly), but instead of suppressing lactation the milk flow was encouraged. Feeding from the uninvolved breast was continued in unilateral disease and the infected breast was emptied after each feed. This emptying was accomplished by the patient herself by manual expression. Manual expression was preferred to the use of the breast-pump as a better means of achieving *complete* evacuation. If suction is applied to a tube obstructed at any point the suction will not empty the tube beyond the block but merely cause collapse of the tube between the block and the sucker. (Unless of course the tube is rigid or otherwise resistant to external pressure.)

Pain or tenderness did not interfere to any significant extent with the manual expression of the milk; for one of the most striking effects of penicillin therapy was the rapid relief of pain. The patient was taught to empty the breast as completely as possible, special attention being paid to the axillary tail. As soon as all clinical signs of infection had disappeared, normal feeding was resumed. A major advantage of this procedure is that there is minimal interference with the infant's diet and weaning is unnecessary. The importance of this is obvious and should not need to be stressed.

What danger to the child arises if breast-feeding is continued? All the standard textbooks recommend weaning, and heretofore this practice has generally followed, although Florey et al. (1946) and T Way (1946) have advocated continued breast Before recommending such a fundamental tactical one must be satisfied that no harm will result and in fact considerable advantage will be gained. advantage to the mother has already been shown continued lactation with proper emptying of the makes for easier and more rapid control of the Possible advantages to the child in the breast-feeding where possible are well recognised need no further emphasis here. It remains to be sidered whether or not there are any dangers in a mother to feed her child while carrying in her breast. At first sight one would run a considerable risk of giving the child a enteritis.

Altogether in this series 74 women with simple uni acute mastitis continued to feed their child from healthy breast, and these feeds were supplemented milk expressed from the inflamed breast and boiled five minutes before being given to the baby. 10 wo had bilateral acute mastitis and in all 10 the baby fed on the boiled expressed milk. In these 84 cases child developed a gastro-enteritis. (1 had green st for twelve hours.) This happy result was secured des a minor epidemic of diarrhœa and vomiting in maternity unit during the period under review. Tay and Way (1946) allowed the infant to feed dir from the infected breast and reported that no baby their series developed gastro-enteritis. I would hesitat support this practice, preferring to boil the milk f rather than allow direct feeding.

In 25 cases culture of the milk from the infected bre was made. In 24 of these a mixed growth was obta of *Staph. aureus* and *Staph. albus*. In the 25th c *Staph. albus* was grown. In all 25 cases the milk was ste on culture after five minutes' boiling. As a con cultures were made of the milk of 25 apparently hea mothers. Only 1 of these mothers yielded milk w was completely sterile—in all the remaining 24 St *albus* was grown and in 4 of these *Staph. aureus* as w In all the 25 control cases swabs from the nipple gr the same organism as the milk in the correspond case, and the 4 mothers who showed *Staph. au* had an apparently identical *Staph. aureus* in th nostrils.

This series is admittedly small, but the facts c suggest that there is no danger to the child in the co tinuance of breast-feeding in the presence of ac mastitis, provided the milk from the infected breas boiled for five minutes before being given to th baby.

In 4 of the 88 cases, the baby was dead at the time o the onset of the infection, and so it was obvious desirable to suppress lactation. The same principle o achieving complete emptying was nevertheless applied The breasts were emptied by manual expression thr times daily until all lactation had ceased; once eac day the emptying was done by the ward sister or th house-surgeon to ensure that all areas, particularly th axillary tail, were thoroughly evacuated.

The next point to be stressed is the urgency of beginni penicillin therapy as soon as there is any suspicion of th onset of acute mastitis.

Table II bears out the contention of so many writers that in diseases amenable to the action of penicillin th sooner active treatment is begun the easier it is to control the infection. It is obvious from this table that a delay of as little as twelve hours in commencing treatment may add greatly to the inconvenience suffered by the patient. If we are to brook no delay we must be watchful for the *early* signs of the onset of mastitis and not merely a small tenotomy incision over the point of m swelling.

CONCLUSIONS

 outset of this paper I stated three aims, and it to be considered how far these have been

ıpid Control and Cure.—The present series rates that speedy control of acute mastitis can ved by the exhibition of systemic penicillin if it is started at the first sign of inflammation. It m belief that if all cases of acute mastitis are so th no breast abscess need ever occur.

inimal Interference with Breast-feeding.—It has wn that not only is weaning unnecessary but in disease is easier to control if the flow of milk is ed.

inimal Scarring in Cases requiring Drainage.— d of incision has been described which provides e drainage with minimal damage to breast tissue ch leaves an almost invisible scar.

SUMMARY

periences in the treatment of 153 cases of acute are described.

e *Staphylococcus aureus* was the commonest e organism.

lk stagnation was one of the most important in the ætiology.

the earliest sign of possible acute inflammation east, a course of systemic penicillin should be

there is any induration in the breast immediate should be practised.

new method of incision is described which gives llent cosmetic result.

ute mastitis is no bar to the continuance of eeding.

—Recent reports (e.g., Jones and Shooter 1948) that in the near future the use of watery solutions of n may give way to single daily injections of about units of procaine penicillin. Such an advance would loubly easy the treatment of acute mastitis by the practitioner.

h to record my grateful thanks to Mr. C. H. Walsh, ., and to Mr. J. Cosbie Ross, F.R.C.S., who gave me ion and encouragement to treat cases in their wards.

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· expenditures in 1948 in nongovernmental general ls exceeded income from patients in two-thirds of the ions and expenditures exceeded all income in at least rd of these hospitals. So greatly have costs of care recent years that a large special hospital in Chicago, h . . . a great proportion of the beds are devoted to patients, shows by its records that not one patient in spital during 1949 has paid the cost of the services d. Can patients pay hospital costs? The national e expenditure per patient day in hospitals for short lnesses during the four year period 1945 through 1948 om $8 60 to $13·09. The average cost per day in one luring 1948 exceeded the 1945 average by almost 100 nt."—Leading article, *J. Amer. med. Ass.* Sept. 10,

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HÆMOPHILUS INFLUENZÆ MENINGITIS TREATED WITH STREPTOMYCIN

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THE treatment of *Hæmophilus influenzæ* meningitis, once purely palliative, is now complicated by an *embarras de richesse* of many different specific agents. Sulphonamides, rabbit serum, penicillin, and streptomycin are the chief drugs in use. Cures have been reported with each of these, alone and in almost every possible combination (Alexander 1944, Alexander et al. 1946, Alexander and Leidy 1947, Grelland 1946, Smythe 1948, Gottlieb et al. 1947, Weinstein 1946, Nussbaum et al. 1946, Zinnemann 1946).

In the cases reported here the value of streptomycin was confirmed. Dosage was sometimes slightly higher, and duration of treatment longer, than those suggested by the Medical Research Council (1948a). The clinical progress of the child, rather than the bacteriology of the cerebrospinal fluid (C.S.F.), was the criterion by which treatment was regulated. A detailed investigation of the mental and physical condition of the children was also made $3^1/_2$ to 17 months after the end of treatment to assess the late results.

THE PATIENTS

Between July, 1947, and November, 1948, ten children with meningitis due to *H. influenzæ* were admitted to the Radcliffe Infirmary. This represents a hospital increase in the incidence both absolutely and relatively to other forms of non-tuberculous meningitis (table I). The increase may have been due to several factors: the availability of streptomycin solely at the central hospital, improved diagnosis, and, perhaps, a true rise in the incidence. Grelland (1946), in Norway, and Engbaek (1948), in Denmark, have found similarly that hæmophilus meningitis is increasingly diagnosed in their respective countries.

TABLE I—HOSPITAL ADMISSIONS FOR MENINGOCOCCAL AND *H. influenzæ* MENINGITIS IN CHILDREN UNDER THE AGE OF 14

Organism . .	*H. influenzæ*		Meningococcus	
Period . . .	1938–46	1947–48	1938–46	1947–48
Total cases	13	11	94	18
Percentage of all forms of non-tuberculous meningitis in children	7 %	30 %	50 %	49 %

Epidemiology.—The scatter in time and space was such that no connexion between one case and another was established. In no case had any member of a patient's household had any known illness in the two weeks preceding that patient's admission. The families from which the children came averaged 4·3 children apiece. No patient had less than two elder siblings; the significance of this fact is being investigated.

Age.—The eldest patient was aged 3 years; six patients were aged less than a year. This is the usual age-distribution of the disease in this country.

Course before Admission.—The onset had usually been insidious. The average duration of definite symptoms before admission was 7·5 days (in eighteen meningococcal cases admitted in the same period the corresponding figure was 3·8 days). The earliest and most constant symptoms had been drowsiness and irritability; these had been specifically noted in nine of the ten cases. Neck stiffness had been noted on the first day in two cases, both of them severe, and two children had had relatively narrow opening to a large central cavity. The earlier treatment had silenced the symptoms at the cost of a maimed breast.

It has been suggested that incision may be avoided by aspiration of the pus and instillation of penicillin into the abscess cavity (Florey et al. 1946). This technique was tried in 5 cases. The abscess was entered with a large-bore needle and as much as possible of the pus aspirated: 10,000 units of penicillin in about 10 ml. of water were instilled into the cavity. This was repeated daily as long as there was any pus. It was soon obvious that this method was open to many objections: the discomfort to the patient was considerable; it was difficult if not impossible to secure complete evacuation of pus; and it is often impossible to empty all loculi without considerable probing with the needle, which (to be effective) requires a general anæsthetic, thus nullifying what is said to be one of the chief advantages of this technique. The following case-history illustrates these objections:

A primipara, aged 26, was admitted six weeks post partum. A tender swelling below the left nipple, present for ten days, had been treated by her doctor with sulphonamides and poultices with no improvement. The abscess, 7 cm. in diameter, was below the areolar margin at 6 o'clock in the left breast. No constitutional disturbance.

Intramuscular penicillin, 20,000 units four-hourly, was begun. Using a large-bore needle attached to a 20 ml. syringe, about 20 ml. of thick pus was withdrawn and 10 ml. of a watery solution of 10,000 units of penicillin was inserted into the cavity. Pus gave on culture a pure growth of coagulase-positive penicillin-sensitive *Staph. aureus.*

Dec.	16,	25	ml.	pus aspirated	Penicillin 10,000 units (in 10 ml. water instilled each day
,,	17,	18	,,	,, ,,	
,,	18,	23	,,	,, ,,	
,,	19,	40	,,	,, ,,	10,000 units in 25 ml.
,,	20,	7	,,	,, ,,	10,000 units in 5 ml.
,,	21,	2	,,	,, ,,	

On Dec. 22 the abscess was re-forming. Under thiopentone anæsthesia a stab incision was made at 6 o'clock at the areolar margin. Very thick pus evacuated. All thickened zones entered with sinus forceps and pus expressed. A Charrière rubber catheter (no. 10) led into cavity. Culture of the pus obtained on this occasion gave again a coagulase-positive penicillin-sensitive *Staph. aureus.* On the 24th improvement was considerable and induration almost gone. Systemic penicillin was stopped. On the 27th all inflammation was resolved; very slight serous discharge around catheter. The catheter was removed and the patient went home. On the 30th the wound was healed, with only slight residual thickening.

Of the other 4 cases treated by the aspiration technique, 1 required incision on the sixth day and the remaining 3 were apparently resolved on the fourth, fifth, and ninth days. Repeated aspiration is inefficient and is very unpleasant for the patient.

At first the cases needing drainage were dealt with by the classical radial incision. In the main this incision is satisfactory, but sometimes the scar is very unsightly. In an effort to improve the cosmetic result I adopted for a while a curved incision in the submammary fold. Entirely contrary to my expectations this incision was very slow to heal, chiefly because the upper lip, borne down by the weight of the breast, tended to slide down and override the relatively fixed lower lip. The consequent difficulty in maintaining apposition of the healing edges, combined with the almost inevitable low-grade sepsis in the wound, made union slow and unsatisfactory. This incision has been advocated for a retromammary abscess but no such case was encountered in the present series.

A further objection to both the long radial and the long submammary incision was soon apparent. 5 cases treated thus were secondarily invaded by a hæmolytic streptococcus and in all 5 this caused a considerable delay in healing. Obviously the length of the incision cannot be held solely responsible for such invasion—but the risk would seem much less with small incision.

Observing that the majority of neglected ab tend to point at the areolar margin, or close to it, tried an incision about 1 cm. long placed the areolar margin. To avoid duct damage this is made through skin and superficial fascia through it a long pair of narrow-bladed ar thrust into the abscess cavity. By palpating instrument with the left hand laid flat on the indurated areas and loculi can be entered and As much as possible of the pus is expressed (danger of disseminating infection if preoperative has been given). A small rubber tissue drain is for twenty-four hours, a dry dressing is applied, breast so bandaged as to keep it well supported. penicillin, 100,000 units eight-hourly is gi first dose being ad tered with the operative atropine. Florey has shown this dosage of peni adequate to maint bacteriostatic conc tion in any we exudate.

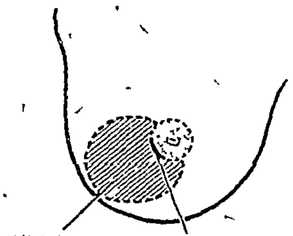

Fig. 1—Incision exactly on areolar margin.

The technique illustrated in figs. 1

In this series abscesses were tr in this fashion, in them the average time from incision to co healing was 6·9 days. Usually the wound was dry fourth day, when administration of penicillin was st In all these cases emphasis was laid on manual exp *of all milk in the infected breast,* as previously des In none of the 31 did a secondary abscess develop. a cosmetic point of view this incision is very satis the scar being almost invisible after a couple of So satisfactory have I found it that I would recom its adoption for any abscess near to the areola. F few cases in which the abscess is near the periph in the axillary tail, the same technique can be fo

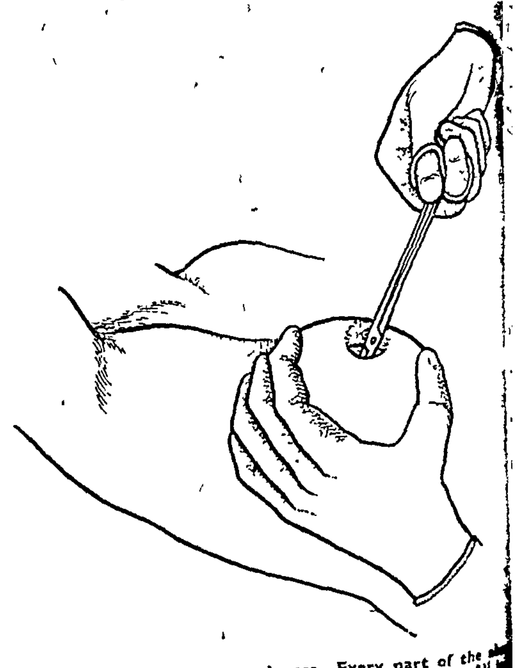

Fig. 2—Forceps about to enter abscess. Every part of the should be palpated against the point of the forceps. All (also any "lactoceles") can thus be felt and entered.

TABLE IV—STATE OF CHILDREN 2½–15 MONTHS AFTER DISCHARGE FROM HOSPITAL

Age	Months since discharge	Weight (lb.)	History and physical findings	Intelligence and behaviour pattern	C.S.F.		Fasting sugar levels (mg. per 100 ml.)		Cold caloric test	
					Cells per c.mm.	Protein (mg. per 100 ml.)	C.S.F.	Blood	Right	Left
3 yr. 2 mos.	12	31½	? Petit mal; healthy child	Advanced for age	1 lymph	16	67	90	Normal	Normal
3 yr. 10 mos.	9	35¼	Normal development, healthy child	Advanced for age	7 lymphs	28	67	75	Normal	Normal
1 yr. 9 mos.	10	24¾	Normal development, healthy child	Average for age	1 lymph	21	65	103	Normal	Normal
1 yr 8 mos.	10	25½	Transient external squint, healthy child	Slightly below average	3 lymphs	32	57	66	Normal	No response
2 yr. 4 mos.	14	33¼	Normal development, healthy child	Average for age	2 lymphs	31	59	70	Normal	Normal
2 yr.	15	27	Normal development, healthy child	Slightly below average	..	..	..	..	Normal response to rotation	
1 yr. 3 mos.	11	22½	Normal development, healthy child	Average for age	1 lymph	38	55	75	Normal	Normal
1 yr. 11 mos.	2½	28¼	Normal development, healthy child	Average for age	17 lymphs, 2 polys	35	44	65	No response	No response
2 yr. 10 mos.	2½	28	Normal development, chronic eczema, facial paresis	Advanced for age	7 lymphs	50	57	79	No response	No response

The radiographic appearances of the skull were normal in all cases.

OUTCOME

ne patients recovered, and one died. To assess the results of treatment the surviving children were itted again 2½–15 months after discharge from ital (table IV).

ental Development.—A detailed account of the child's vas obtained from the mother. The early histories e elder siblings, of whom there were not less than in each case, were also taken and used as controls in each family. The patients were then observed idually for 45 minutes to an hour with their mothers, for a further 4–5 hours alone and with other children. pattern of their behaviour, their dexterity and bulary, their ability to solve simple problems, their ions to strange situations, and the variations and sity of their emotional tone were noted. In no did these observations reveal any significant tion from the normal range.

ysical Development.—Physical examination revealed ntirely normal child in all except case 9, who had a -sided supranuclear facial paresis when seen 2½ ths after discharge; this had resolved completely nths later. Case 1 gave a history suggesting petit during the first 3 months after discharge from ital, when six episodes were seen by her parents. ach she stopped her playing suddenly, squatted, d vacantly into space, and did not respond to her e or to shaking. Within 2 minutes she had returned rmal. The attacks did not recur during the subset 9 months, and an electro-encephalogram taken at nd of this time gave no evidence of epileptic activity. onal' electro-encephalograms were made also of the survivors; there were some minor abnormalities no evidence of gross cerebral damage. Skull radios showed no spreading of sutures. The C.S.F. was al apart from a slightly raised C.S.F.-protein level a few lymphocytes in some cases (table IV).

CASE-RECORDS

e two cases which took an unusual course under ment were as follows:

se 6.—A boy, aged 9 months, the fifth child of healthy nts, had been quite well until 2 days before admission, he had become drowsy and later had a brief convulsion. day he had been more drowsy, had vomited his milk, ad several small fits. His family doctor had found fever stiff neck and sent him to the local hospital. A lumbar ture had produced C.S.F. under an initial pressure of mm. C.S.F. and 8 ml. of turbid fluid had been removed, from which a profuse growth of *H. influenzæ* was subsequently obtained. The patient had been given intramuscular 'Sulphamezathine' 1 g. followed by 0·25 g. three-hourly thereafter, and penicillin 50,000 units three-hourly. That same evening a second lumbar puncture had found the pressure low and very little fluid obtainable. Next day the patient was transferred to the Radcliffe Infirmary.

On admission on Nov. 21, 1947, at 2 P.M. he was a large, well-nourished, and well-hydrated baby, conscious and crying vigorously. There were slight head retraction, definite neck stiffness, and a slightly bulging fontanelle; the limbs were hypotonic. During the examination the patient had an attack; he suddenly became blue-grey, rolled his eyes upwards and outwards, and appeared to become unconscious. Within a few minutes his colour returned and he again

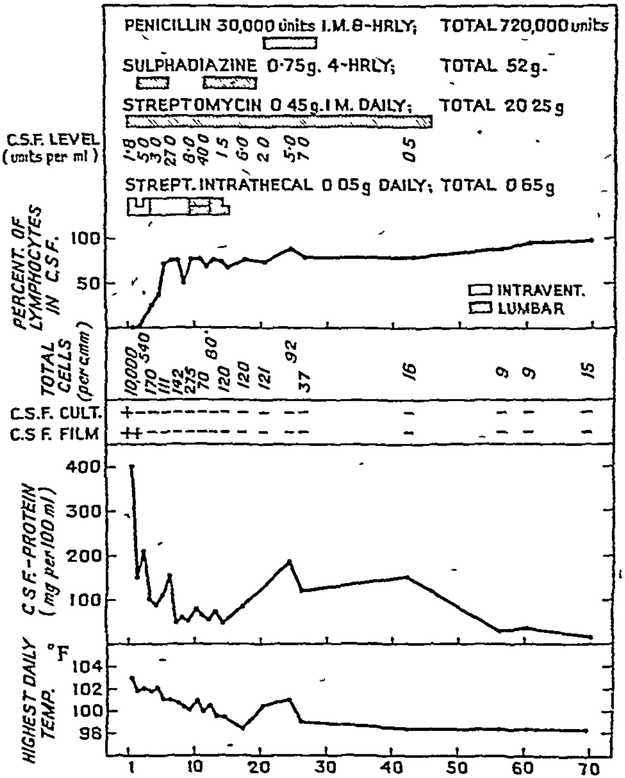

Chart of case 6.

TABLE III—CHEMOTHERAPY

Case no.	Total intrathecal dosage (units × days)	Total intramuscular dosage (units × days)	Other drugs (daily dose × days)	Range of C.S.F.-streptomycin levels 24 hours after intrathecal administration (units per ml.)
1	75,000 × 8	750,000 × 12	..	1–16
2	75,000 × 9	700,000 × 8	..	2·5–6·5
3	50,000 × 6	..	Penicillin 300,000 units × 10 Sulphadiazine 4·5 g. × 10	4–35
4	50,000 × 6	450,000 × 12	..	10–17
5	50,000 × 9; repeat course of 50,000 × 5	450,000 × 19; repeat course of 450,000 × 7	..	5–25
6	50,000 × 13 25,000 × 2	450,000 × 45	Sulphadiazine 4 g. × 13	2–40
7	50,000 × 14	300,000 × 22	..	12–46
8	75,000 × 8	525,000 × 8	Sulphadiazine 4 g. × 5	21–64
9	75,000 × 7	675,000 × 7	Sulphadiazine 4 g. × 10	12–50
10 (died)	50,000 × 2 and 75,000 at operation	100,000 × 2	..	1–2

convulsions. Apart from fever, signs of pneumonia in one case and of otitis media in one other, no other definite physical signs had been reported by the family doctors. The patients had tended to become progressively more ill until admission, though the disease had been notably modified when intensive penicillin or sulphonamide therapy had been given.

Condition on Admission.—The clinical picture on admission was fairly uniform. The children were febrile, drowsy, and irritable. Nuchal rigidity was found in every patient and, apart from bulging of the fontanelle, was the only neurological sign in nine cases; there were other signs in the only fatal case (case 10 below). Disease of other systems was found in three cases: bilateral otitis media once, and pneumonia of a lower lobe twice. The children were well nourished, and dehydration needing intravenous fluid was not seen. Considered solely in terms of their appearance the children were classified as severely ill, three; moderately ill, five; and mildly ill, two. The initial findings in the C.S.F. varied widely (table II). The general pattern was polymorph pleocytosis, with a considerable increase in protein; sugar was diminished or (by the non-quantitative test used) absent. *H. influenzæ* was seen in films and was grown from the first lumbar specimen in each case; this was the sole criterion of diagnosis. Other initial investigations showed the expected polymorph leucocytosis in the blood, with a mild hypochromic anæmia. Chests radiogram showed a distinct pneumonia once, and increased basal markings once; otherwise there were no significant abnormalities. Patch tests were uniformly negative. No pathogenic organisms were isolated from throat or nasal swabs. Bloo not made.

TREATMENT

The intramuscular dosage of streptomycin was adj roughly to be 20,000 units per lb. of body-weight as suggested by the Medical Research Council (1 Individual intrathecal doses were sometimes higher those recommended; six patients received 50,000 daily, and four 75,000 units daily (table III). The of streptomycin treatment was determined by condition of the patients rather than by the of the C.S.F. In five cases treatment was more than 7 days after the first sterile C.S.F., receiving 45 days' intramuscular and 15 days' treatment. In addition, sulphadiazine was used in cases, and penicillin was added in one case. barbitone gr. $^1/_8$–$^3/_4$ t.d.s., the dosage varying with was given routinely as prophylaxis against convul since in infants fits may be fatal; two children had fits before admission; and no fits were seen after ph barbitone had been given. Ferrous sulphate was g in four cases as treatment for anæmia.

PROGRESS

The assessment of progress fell under three hea progress by the third day; progress between the and the eighth day; and progress thereafter. first had a fairly well-marked pattern in C.S.F. cha the second was the period of clinical resolution, and third was not clearly defined.

By the Third Day.—In all cases the C.S.F. was st at the end of 48 hours' treatment. By the third there was an obvious fall in temperature and in amount of protein and white cells in the C.S.F., wi rise, usually of about 25–50%, in the percentag lymphocytes.

Between the Fifth and the Eighth Day.—This was period of clinical resolution: neck stiffness, drowsin irritability, and evidence of toxæmia disappeared; children became lively and alert; and their we began to rise.

Thereafter.—From the 8th day onwards progress more difficult to assess. Clinical examination did reveal any striking changes. The temperature, exc in 2 cases, remained normal. The C.S.F. was abnormal as regards cells, protein, and, sometim sugar. The figures for cells and protein varied wi from case to case; in any given case the total num of cells showed a slow decline, with a corresponding in the percentage of lymphocytes. The amoun protein declined in parallel with that of the cells, graphs tending to an exponential type of curve. C.S.F. remained mildly abnormal in several cases 90 days after the institution of treatment (table IV).

TABLE II—INITIAL FINDINGS IN TEN CASES OF INFLUENZAL MENINGITIS

Case no.	Age	Day of disease	Clinical severity	Blood		Cerebrospinal fluid				Sensitivity of organism to streptomycin (units per ml.)	Chemotherapy before admission
				White cells per c.mm.	Hæmoglobin (%)	Protein (mg. per 100 ml.)	Cells per c.mm.	Neutrophils (%)	Culture		
1	2 yr. 3 mos.	1	Moderate	9000	86	700	750	73	+	1·25	None
2	3 yr.	4	Mild	17,000	88	800	3872	95	+	2·0	Sulphathiazole 1 g. Pe cillin 20,000 units i.t.
3	10 mos.	8–9	Mild	22,000	50	35	278	25	+	0·5	Penicillin 2,600,000 i.m.
4	9 mos.	14–16	Moderate	15,000	68	70	1850	90	+	1·25	Penicillin 320,000 units Sulphadiazine 3 g.
5	1 yr.	23–40	Moderate	20,000	73	650	2800	80	+	1·0	Penicillin 960,000 units Sulphadiazine 10 g.
6	9 mos.	3	Severe	10,000	63	425	10,000	97	+	0·6	None
7	$3^1/_2$ mos.	6	Severe	9000	64	500	13,000	96	+	0·7	None
8	1 yr. 6 mos.	9	Moderate	..	..	80	3833	90	+	..	Penicillin 900,000 units Sulphathiazole 7 g.
9	2 yr. 8 mos.	7	Moderate	10,000	84	80	1442	66	+	..	None
10	10 mos.	21–25	Severe	20,000	68	500	3000	35	+	..	Penicillin 1,440,000 i.m. Sulphadiazine 12

mides or with rabbit serum in the remainder. ledical Research Council (1948b) reported thirty- complete recoveries in fifty cases treated with omycin. Since the present series ended there been four further cases at the Radcliffe Infirmary, covering completely. The recovery-rate in our al is now therefore 93%—i.e., thirteen in fourteen cutive cases.

TREATMENT AND PROGNOSTIC SIGNS

e treatment of *H. influenzæ* meningitis is still imental, and the prognostic signs by which it is to dged have not yet been fully assessed. Sterility of .S.F. for 7 days does not necessarily indicate that ion is at an end (Smythe 1948, Medical Research cil 1948b). The persistent abnormality in the C.S.F. and to a less extent in protein in this series (table IV) have been due to a mild chemical meningitis induced reptomycin, but an early and continued rise in the ntage of lymphocytes ran parallel with clinical ovement.

e did not use the quantitative sugar test during the phase in this series. This estimation has been l of great value by Alexander (1944) and Alexander . (1946) both in the assessment of severity and guide to progress. Smythe (1948) found, however, some clinically severe cases had normal C.S.F.-sugar s. Brøchner-Mortensen et al. (1948) did not find C.S.F.-sugar level a reliable guide. There seem to wo possible factors, apart from the disease process , which might cause unexpected variations in the r levels :

Alvaro and Nicola (1948) showed that streptomycin was ucing agent, particularly when diluted. They suggested sugar estimations during streptomycin treatment were fore unreliable. Nitti and Curci (1947) had already n that 1 g. of streptomycin had a reducing effect equiva- to that of 0 44 g. of sugar. However, Mr. E. J. Higgins onal communication 1949) has shown that a concentration reptomycin 500 units per ml. has a reducing effect alent to that of 10 mg. of glucose per 100 ml. in water. last observation suggests that, under conditions obtaining actice, the direct effect of streptomycin on the apparent sugar level is negligible.

Parallel studies on blood-sugar levels are not commonly rted. The recovered cases in this series showed a mean ng blood-sugar : C.S.F.-sugar ratio of 1·33, with a range 58–1·12. Katzenelbogen (1936) showed that the C.S.F.- r level was determined by several factors, of which the l-sugar was, in health, the most important. The range rmal values was wide. When the meninges are inflamed, tional factors operate. The number of leucocytes, the ence of organisms, and changes in the permeability of the d-brain barrier may each independently affect the sugar es.

stimation of the C.S.F.-sugar level after a twelve-hour and with a parallel estimation of the blood-sugar as likely to eliminate factors outside the central ous system. When this precaution is not taken, lerline figures and small variations seem to be of btful significance.

homson et al. (1947) found that the temperature chart a reliable guide to progress, and certainly in eight of ten cases there was a steady decline in fever following institution of treatment. Probably the child's ntal condition, weight, and temperature, taken ether and in the absence of intercurrent infections, a reasonable measure of the success of treatment.

COMPLICATIONS

here were few complications in this series. Drug- stant organisms were not encountered : we did not t the arthritis described by Smythe (1948), nor were re any serious residual lesions. The possibility of rcurrent infections, particularly with *Staph. aureus,* emphasised by Weinstein (1946), and such an infection probably occurred in case 6, penicillin rapidly controlling the infection.

Spinal block has been reported by Alexander (1944) in patients treated with serum, by Jones (1947) in those treated with penicillin, and by the National Research Council (1946) in those treated with streptomycin. Alexander (1944) has treated this complication successfully with heparin and air injections. However, St. Hill et al. (1948) have shown that commercial streptomycin (calcium complex or hydrochloride) precipitates heparin, unless special precautions are taken. Complete spinal block occurred twice in this series. In both cases intrathecal treatment was continued through bifrontal burr-holes into the lateral ventricles. In the patient who survived, the use of the lumbar route was resumed in 3 days.

All the nine survivors had tests of vestibular function during the follow-up period. Cold caloric tests did not elicit a response in cases 8 and 9. These two children were tested the shortest time of any after the end of streptomycin treatment and, though they had been given streptomycin for only 8 and 7 days, their C.S.F.-streptomycin levels were exceptionally high (table III). Brown and Hinshaw (1946) found that the toxic action of streptomycin on the eighth nerve was invariably slight in the young, and in only 1 in 23 in their series did symptoms appear in less than 2 weeks of treatment. Five of our nine survivors received intramuscular streptomycin for 12 days or more ; one of these showed an absent caloric response on one side. The responses of three more were normal. One child was not tested, but he showed a brisk vestibular response to rotation. None of the children had symptoms of vestibular damage, and none of them was deaf.

Penicillin in moderate dosage had been given to five of our patients before admission (table II). In no case, however, had the C.S.F. been sterilised. Previous experience in this hospital confirms the opinion of Gottlieb et al. (1947) that penicillin is efficient only when given in massive dosage. Penicillin therapy has the further disadvantage that the in-vitro sensitivity of the organism bears little relation to the clinical response.

CONCLUSIONS

Streptomycin is an efficient remedy for *H. influenzæ* meningitis. The duration and intensity of treatment are best decided on clinical assessment of each patient. Larger doses and longer courses than those usually recommended can be used with safety. The use of sulphadiazine gives an additional safeguard against drug-fast relapses, and phenobarbitone is a useful safeguard against fits. Spinal block requires prompt surgical treatment. The combination of streptomycin and sulphadiazine is, in our opinion, the treatment of choice. When streptomycin is unobtainable, massive penicillin therapy is useful.

SUMMARY

Ten cases of hæmophilus meningitis are described. Treatment with intrathecal and intramuscular streptomycin, together with sulphonamides by mouth, was successful in nine cases, and a further three cases have since made complete recoveries.

The child's general condition is the best guide to progress.

Mental and physical development of the survivors was studied $2^1/_2$–15 months after discharge, and no significant retardation was found.

I wish to thank Dr. V. Smallpeice, under whose care these patients were treated, for encouragement and permission to publish. My thanks are also due to Dr. Dawn Bosanquet and Mr. E. J. Higgins.

References at foot of next page

appeared to be conscious. Phenobarbitone gr. 1 was given intramuscularly, followed by gr. 1/2 eight-hourly.

Lumbar puncture at 6 P.M. produced a very sluggish flow of C.S.F. through a wide-bore needle. Suction was applied without success. The child at once became limp and grey, with pin-point pupils and shallow irregular respirations. Within half an hour he recovered his former state.

At 7 P.M. bifrontal burr-holes were made. Needling of the ventricles gave a turbid C.S.F. under a pressure of 230 mm. C.S.F. Streptomycin 50,000 units was injected into the left ventricle. Intramuscular streptomycin 150,000 units eight-hourly and sulphadiazine 0·75 g. four-hourly were given. At 10 P.M. the child was more ill and drowsy, with a temperature of 104°F.

On Nov. 22 his general condition was better, though the meningitic signs were more marked. He was taking feeds well, and his temperature had fallen to 102°F. Streptomycin 25,000 units was given into the lateral ventricle.

Radiography at this time showed no abnormality in chest or skull, save for a little air in the left lateral ventricle.

Blood examination showed Hb 10·9 g. per 100 ml., and leucocytes 13,000 per c.mm. (neutrophils 6890, lymphocytes 5460, monocytes 520).

On Nov. 23 the C.S.F. had been sterile for twenty-four hours and showed a considerable fall in the amounts of protein and cells; the child had clinically improved, and his neck stiffness and photophobia were less. Lumbar puncture on Nov. 24 produced a free flow of C.S.F., and thereafter all intrathecal streptomycin was given by this route.

By Nov. 29 the child was playing and laughing, though his temperature was still raised. Since the lumbar C.S.F.-streptomycin levels had been low (3–8 units per ml.) on the previous days, 25,000 units was given twice daily from Nov. 30 to Dec. 2, and on Dec. 2 the level was 41 units per ml.

On Dec. 6 intrathecal streptomycin was stopped. In the next four days the patient lost 17 oz. in weight. On Dec. 10 he became listless, irritable, and febrile, and on Dec. 12 he began to vomit and was still losing weight. His neck became stiff, and the left frontal burr-hole was swollen. The C.S.F. remained sterile and showed a slight rise in the amount of protein, but none in that of the cells. Systemic penicillin was given, and within a few days all these symptoms subsided, without their significance being fully understood.

Discharge and Follow-up.—The patient was discharged on Jan. 22, 1948. He was re-examined on May 3, 1949 (15 months later), and was then a normal child, with manipulative ability in advance of his age and with speech of slightly less than average development. There were no residual lesions.

In this patient the disease ran a protracted course (see figure) and was complicated by convulsions and by spinal block, which was circumvented by prompt ventricular streptomycin treatment. The patient received 15 days' intrathecal and 45 days' intramuscular streptomycin. The infecting organism was sensitive to a streptomycin level of 0·6 unit per ml. Four days after intrathecal streptomycin was stopped the patient had an attack resembling a hydrocephalic attack, which subsided without any treatment other than systemic penicillin. In spite of all these factors recovery was complete.

The next case was the only fatal one of the series:

Case 10.—A girl, aged 10 months, the fifth child of healthy parents, had been normal during her first 9 months of life. Sixteen days before admission she had been feverish, vomited several times, and appeared to have pain in her right ear. Fourteen days before admission bilateral paracentesis of the drums had been performed, and she had been given intramuscular penicillin 80,000 units three-hourly and sulphadiazine 0·25 g. by mouth four-hourly. Her general condition had improved, and her temperature had fallen. Eight days before admission chemotherapy had been stopped. Two days later the girl had begun to vomit, her temperature had risen, and her general condition had declined. Next day chemotherapy had been given again as on the previous schedule. Five days before admission neck stiffness had been found for the first time and, on lumbar puncture, a purulent fluid containing *H. influenzæ* had been obtained. Penicillin had been discontinued next day. Thereafter there had been a steady deterioration in the general condition and an increase in the meningitic signs.

On admission at 4.30 P.M. on July 7, 1947, she was a pallid ill child, weighing 16 lb., with a temperature of 101·2°F, respirations 42 per min., and pulse-rate 146. Both showed chronic congestive changes. There were well head retraction and neck stiffness, a bilateral external palsy, and, probably, complete blindness. All refle increased, and both plantar responses were extensor.

Lumbar puncture produced a cloudy C.S.F. 500 mg. of protein per 100 ml., 3000 white cells per (lymphocytes 65%), and a few gram-negative rods. gave a moderate growth of *H. influenzæ*.

Blood-count.—Hb 10 g. per 100 ml. (68%); red 3,900,000 per c.mm., white cells 20,000 per c.mm. (ne 12,000, lymphocytes 6800, monocytes 1200).

Radiography of skull and chest revealed no ab

Treatment.—Intrathecal streptomycin 50,000 units muscular streptomycin 100,000 units were given eight Phenobarbitone gr. 1/8 t.d.s. was given in feeds. On 1947, there was a slight improvement. The patient's perature was 99°F. She took three feeds by mouth vomited but little. On that day, at 2.45 P.M., lum yielded only 0·5 ml. of C.S.F., and there appeared a spinal block; streptomycin 50,000 units was The aspirated fluid was sterile on culture and con streptomycin 2 units per ml. and 5000 white cells per (lymphocytes 51%).

Operation.—About six hours later Sir Hugh Cairns bifrontal burr-holes, and both lateral ventricles were ta The ventricular pressure was 580 mm. of C.S.F. The from the right ventricle contained protein 60 mg. per 10 cells 60 per c.mm. (polymorphs 27, lymphocytes 33 streptomycin 2 units per ml. Streptomycin 75,000 unit introduced into the right ventricle. Next day the p seemed to be improving in the morning, but in the afte she suddenly stopped breathing and died.

Necropsy Findings (Dr. Dawn Bosanquet).—Apart chronic bilateral otitis media there were no macro lesions outside the central nervous system. Macroscop there was a gross meningitis with thick pus over the b the brain and down the spinal cord. The frontal showed microscopically a little infiltration of the pia arac over the convexity of [illegible] in the sulci. The e[illegible] macrophages, and round cells. There was no obvious of the superficial vessels in the brain, but the section in a small piece of ependymal surface, and here there granular ependymitis. Beneath this the subepend vessels showed a well-marked cuffing, with monon cells. The pons showed microscopically a surface co with a fairly thick exudate. The penetrating vessels pons had exudate in the Virchow-Robin spaces in the ficial part of their course. Beneath the ependyma fourth ventricle the cuffing of the vessels was very spicuous, though the ependyma appeared normal. The superficial layer of the adventitia of the basilar artery slight infiltration with inflammatory cells, though the intima and media appeared normal. In some of the branches the whole thickness of the adventitia was infilt though again the media and the intima appeared unaff The spinal cord showed microscopically a severe ph with thrombosis, but no arteritis except for slight infilt of the adventitia of some of the arteries. In the lu region a few of the anterior-horn cells showed loss of substance and eccentricity of the nuclei. Here there much exudate, of which all the superficial part was ne In the cervical region the nerve-roots were surround exudate, but generally this was much less than in the lu region—a characteristic finding in purulent meningitis.

In this case partial control of the infection by quate chemotherapy led to a chronic meningitis spinal block. Effective chemotherapy was begun late to influence the outcome. Death resulted fro acute hydrocephalic attack.

MORTALITY

The case-mortality from hæmophilus meningitis slowly declining when Alexander (1944) reported th of specific rabbit antiserum combined with su diazine; among eighty-seven cases she had sixty- recoveries. The National Research Council (reported a hundred cases in which streptomycin used, with a 66% recovery-rate; streptomycin was alone in eighteen cases, and in combination with d by a smooth recovery until a pulmonary embolus his life on the 16th postoperative day.

ugh this case was an exception, most surgeons gree that resection of mobile growths of the stomach traightforward procedure compared with resection ne of the penetrating simple lesions which are met This was found to be so in the other malignant ir in our series, which is included as an example bizarre.

e 6.—A woman, aged 42, gave a history of recurrent emeses for 12 years. X-ray examination outlined a defect in the body of the stomach, and a further temesis hastened operative intervention, subtotal ctomy being performed. The resected portion of ch contained an ulcerated growth the size of a tangerine. ved to be a malignant neurinoma.

THE OPERATION

re is no doubt that, wherever possible, partial ctomy is the operation of choice. Alternative dures are ligation of main vessels supplying the area, transgastric ligation of a bleeding-point or fixion and infolding of the ulcer, and resection of ase of the ulcer leaving the crater adherent to rrounding structures and sewing up the hole in the ch.

regards ligation of a spurting vessel, it is notorious a bleeding-point is seldom found when sought, t ligation of the vessels supplying the ulcer crater ghly unsatisfactory as a means of stemming the indeed when both gastric and both gastro-epiploic es are ligated during gastrectomy, the stomach wall leeds vigorously when incised, and those who have ised devascularisation of the stomach as a method ducing acidity know how difficult it is to effect isfactory ischæmia. Resection of the ulcer base closure of the hole in the stomach will control the rrhage, but with the large penetrating posterior ic ulcer, where the surgeon would welcome an native to gastrectomy, it is often only after division e duodenum, enabling the body of the stomach to fted up, that the crater can be resected and the ng in the stomach closed.

se 7.—A woman, aged 56, with a large chronic gastric confirmed by radiography, refused operation and took lischarge. A week later she was readmitted, exsan-ted after a gross hæmatemesis. Operation revealed midable ulcer on the posterior wall of the stomach. rating the transverse mesocolon and pancreas and ding an indeterminate distance towards the fundus. duodenum was divided and the ulcer base cut away the stomach wall, the upper limit being reached after ion on the elevated body of the organ. A hole in the rior stomach wall the size of a five-shilling piece was up, and a high partial gastrectomy performed with the f a Petz sewing clamp. Recovery was uneventful.

e alternative to partial gastrectomy most commonly ised is probably transgastric or transduodenal sfixion of the ulcer bed. This is open to the serious ction that the ulcer is neither put at rest nor removed the digestive action of the gastric juice—two ntials in the satisfactory control of hæmorrhage. ractice, partial gastrectomy is the only operation h offers a guarantee that no further hæmorrhage will r, and the surgeon should not easily be deterred it by considerations of age or unfitness.

ase 8.—A frail, thin woman of 77 had repeated hæma-es from a duodenal ulcer. Despite her poor condition rtial gastrectomy was performed. Recovery followed.

hen a transfixion operation has been carried out the patient continues to bleed, the surgeon is in an ious position and may have to consider gastrectomy a deteriorating subject. The following case shows well unreliability of ulcer transfixion and the possibilities a successful resection in the most unfavourable circumstances. I am indebted for details to Mr. John Scholefield, F.R.C.S., who performed both operations.

Case 9.—A man, aged 43, was admitted in a state of collapse, with extreme pallor and black stools. Previous investigation had suggested a gastric ulcer, and there was little doubt about the nature of the catastrophe. He was treated by massive drip-transfusion, but after two days he had a further large melæna and operation was undertaken forthwith. On opening the abdomen an enormous gastric ulcer was located just proximal to the pylorus which was widely open. There was much altered blood in the intestines and it was obvious that the hæmorrhage was coming from the gastric ulcer. This was a deeply penetrating ulcer and its removal would have been an operation of some magnitude, for which the patient was quite unfit. The stomach was opened and deep sutures passed through the base of the ulcer so that the cavity was obliterated. The hole in the stomach was then closed in the transverse diameter.

Four days later it was noted: "This patient has had a further hæmorrhage today and is obviously going to die unless further surgery is undertaken. He is an exceedingly poor risk for surgical treatment." The abdomen was reopened the same day and a rapid partial gastrectomy performed, the base of the ulcer being left on the pancreas. During this procedure the bleeding vessel was seen spurting in the *middle of the ulcer base and was ligated. It was difficult* to identify but was thought to be either the gastroduodenal artery or the superior pancreaticoduodenal artery.

After this major intervention the patient made a complete recovery, a tribute to the courage and resource of the surgeon.

THE NEGATIVE EXPLORATION

Sometimes, when the abdomen is opened, the anticipated ulcer is neither seen nor felt and no other obvious cause for the hæmorrhage is found. It has been suggested by Amendola (1949) that in these circumstances the stomach and duodenum should be widely opened, the cavity washed out with saline, and the bleeding-point sought: if the bleeding-point is not found, the incision in the stomach is sewn up and the abdomen closed. This plan cannot be recommended: it is difficult to see how gross soiling can be avoided and there can be no guarantee that an erosion will not be missed.

Simply to close the abdomen, having found nothing, is a council of despair and likely to cause embarrassment if a further hæmorrhage occurs. We have had three cases in this unit where careful external examination of the stomach and duodenum did not reveal any abnormality and yet a lesion was found in the resected stomach. Two were acute ulcers with erosion of a blood-vessel; details of one of these will suffice.

Case 10.—A man, aged 52, had had slight dyspepsia for three days. Two days before admission he collapsed and "passed out" and after coming round he had a very large hæmatemesis. After a further hæmorrhage he was admitted in a desperate condition. He received three pints of blood immediately, followed by a continuous drip-transfusion, and was prepared for surgery. Nothing was found on examination of the stomach or duodenum except a few adhesions in the lesser sac and some enlarged glands on the lesser curve. A high partial gastrectomy was carried out; the resected stomach contained multiple erosions in one of which was the orifice of a large vein plugged with clot.

The third case in which there was a shallow chronic ulcer on the posterior wall of the stomach, bears out the fact, which we have previously observed, that some chronic ulcers cannot be felt until the stomach has been widely mobilised.

Case 11.—A woman, aged 55, had been treated for six years for indigestion and hæmatemeses. Three weeks before admission she was involved in an accident and suffered from an exacerbation of her symptoms until the day of her admission when she vomited up a large quantity of blood and felt faint. In view of the strong presumptive history of peptic ulcer, her age, and the fact that she had had several previous hæmatemeses, operation was performed the same night. The stomach and duodenum appeared normal; nevertheless a high resection was carried out and on opening the specimen

SOME PROBLEMS OF EMERGENCY GASTRECTOMY FOR HÆMATEMESIS

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SEVERAL reviews of urgent partial gastrectomy have been published (Gordon-Taylor 1946, Tanner 1949), and gastro-enterologists are increasingly conscious that surgery offers the best chance of survival—in a selected group of patients. Thanks to continuous-drip transfusion, introduced by Marriott and Kekwick (1935), the exsanguinated case is now a rarity; but many surgeons dislike having to deal with a patient with much foreign blood in his veins, believing that those who are sent for surgical intervention at an early stage in the crisis have a smoother postoperative course. The *problem of whether and when to operate remains* the attendant physician's greatest anxiety.

SELECTION FOR SURGERY

At the West Middlesex Hospital our cases are primarily admitted under the care of the physicians, who call in the aid of surgery when they think fit. Our experience is strongly in favour of this arrangement, which is probably in force in the majority of hospitals in this country: provided there is accord between the medical *and surgical staff, it is better for these patients not to* be in the surgeon's charge from the start. Moynihan's ideal of the surgeon who is a physician trained in surgical methods is still far from being generally realised. I need scarcely add, however, that it is equally important for the physician to be cognisant of the benefits which on occasion surgery alone can offer.

The practice in our hospital is to advise surgery for a small group of hæmatemesis patients who present strictly limited indications for operation. These have been admirably summed up by Maingot (1941) and need not be elaborated except to say that we regard age as the most important single factor governing the decision to operate, and are in entire agreement with Avery Jones (1947) on this point. The object of this paper is to illustrate some of the diagnostic traps and technical *difficulties which have arisen in a small series of emer*gency operations for hæmatemesis done in a general surgical unit at the West Middlesex Hospital during the last twelve months.

It is generally agreed that before resorting to opera*tion there should be reasonable evidence of ulceration.* To ignore this would be to bring surgical treatment into disrepute; and yet we have had cause to regret our hand.

Case 1.—A man of 50 was admitted with No adequate previous history was admitted, and, a surgical opinion was sought, nothing beyond suggested an ulcer as the source. Further occurred while he was under medical treatment, and gastrectomy performed as a last resort failed to save The resected specimen showed multiple acute ulcers.

The diagnosis of ulceration may have to be on circumstantial evidence alone, and in several cases of successful resection the acute catastroph proceeded by nothing more definite than postp dyspepsia over a more or less lengthy period. other hand we have learned by bitter experience not every hæmatemesis patient with epigastric after meals has a peptic ulcer.

Case 2.—A man, aged 53, was under treatment in ho for erysipelas of the face when he had a sudden hæmatemesis. He was transferred immediately to our and further blood-loss was so great that exsanguination barely controlled by transfusion through two can A history of epigastric pain after meals for an inde period was elicited, and, though he was too ill to give acccurate acc [illegible] ulcer was thought be the likely [illegible] revealed ascites cirrhosis of t [illegible] d shortly afterw and a post-mortem examination confirmed rupture of œsophageal varix as the source of the hæmorrhage.

When previous radiographic evidence of an ul exists, a confident attack may be planned; yet even these circumstances the surgeon may be disconcert

Case 3.—A woman, aged 70, was admitted after a sev hæmatemesis. She gave a history of post-prandial pain many years, with occasional vomiting, and her doctor wa to say that when she was radiographed three months previo at another hospital the appearances were those of a gastric ulcer. After further hæmatemesis an urgent laparot with a view to gastrectomy was undertaken. On open the abdomen, clear fluid welled forth and a coarsely cirrh shrunken liver was seen. No abnormality was detected the stomach and duodenum, but a strong adhesion compre the lesser curve, and this may have been responsible for fallacious X-ray report.

After these two unhappy experiences the possibil of cirrhosis as a differential diagnosis has become mu more sharply defined, and we view the signs of *fluid in the abdomen with a jaundiced eye.* Neverthel not all gastric patients with shifting dullness in abdominal cavity are suffering from portal obstructi

Case 4.—A patient was admitted for routine par gastrectomy for chronic duodenal ulceration of many ye standing. *On opening the abdomen clear fluid* escaped, it was at first suspected that the anæsthetist had misdirec his infiltration fluid (!). Further examination showed source of the fluid to be a sizeable perforation in the standing ulcer. The patient did not complain of any pain wl waiting in the anæsthetics room, and the perforation must h occurred during induction of anæsthesia (regional block)

Duodenal and gastric ulcers compose the major of lesions in the stomach calling for resection. Fr hæmorrhage from a gastric carcinoma is rare, according to Bockus (1946) not more than 5% of cancers of the stomach have an overt hæmateme We have only one such case in this series, but the unus circumstances make it worth describing.

Case 5.—A man, aged 53, underwent a successful operat for strangulated inguinal hernia. He was a stout, sallow m but nothing untoward was noticed until the 6th day whe was remarked that he was rather pale. By the 8th day progressive pallor could not be ignored and he crystalli our anxieties by vomiting up a quantity of blood. On strength of a vague history of dyspepsia and loss of appe the abdomen was opened, and a large malignant ulcer *palpated on the lesser curve.* A subtotal gastrectomy

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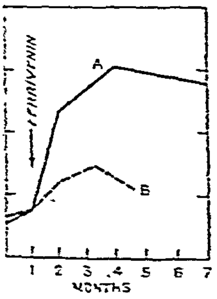
METHOD

e preparation used was ferrivenin. A test dose of g. was given to exclude patients who might be ly sensitive to the drug. The subsequent course sted of 5 daily doses of 200 mg. In one case there mild symptoms, which followed the 2nd dose of mg. and consisted of immediate flushing of the face slight bronchospasm lasting only a few minutes;



1—Average hæmoglobin el after administration ferrivenin: A, in 16 es which responded well; d B, in 7 cases with oor response.

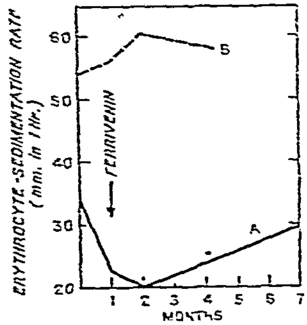


Fig. 2—Average erythrocyte-sedimentation rate (Westergren): A, in 16 cases which responded well to ferrivenin; and B, in 7 cases with a poor response.

quent doses were limited to 100 mg., but the final was raised to 200 mg. without recurrence of ptoms.

hæmoglobin readings were made on a photo- ric colorimeter graduated to register 14·8 g. Hb ml. as 100%. Estimations of the erythrocyte- entation rate (E.S.R.) were made with Westergren s, using Wintrobe's dry potassium and ammonium ate mixture as an anticoagulant.

rnal-marrow biopsies were performed in 4 cases n at random, and all showed a normal active marrow. ric analysis, performed in 8 unselected cases, showed thin normal limits, 2 hyperchlorhydric, and 4 chlorhydric.

RESULTS

16 of the 23 cases a satisfactory rise in the Hb followed the administration of intravenous iron e II).

ter a control period on iron by mouth the average level rose from 70·7 to 72·1%. A month after g. of ferrivenin had been given, the average Hb was 87·5% (fig. 1). The highest average level 95·4%, which was attained in one to six months the last injection. The average Hb level in the observations was 92·5%.

7 cases the response to 1·05 g. of ferrivenin was very . After a month's iron by mouth the average level rose from 71·6 to 72·6%. A month after venin treatment the average Hb level rose from to 77·1%. The average Hb level in the final rvations was 76·5%.

2 of the cases with poor response a second course ·05 g. was given with a slight rise in Hb level, but was not maintained (table II).

se 18 was a very active phase with well-marked articular ction.

se 19 was a confirmed vegetarian of 40 years' standing.

se 21 was bleeding from the intestinal tract, the cause s undiagnosed.

se 23 had bronchiectasis and widespread low-grade mmatory lymphadenopathy.

he E.S.R. in the group responding well to intravenous was initially low and tended to fall, whereas in the up not responding the initial E.S.R. was high and remained raised throughout the period of observation (fig. 2).

DISCUSSION

It appears that the intravenous administration of iron is worth a trial in all cases of hypochromic anæmia associated with rheumatoid arthritis which do not respond satisfactorily to iron by mouth. With ferrivenin, in daily doses not exceeding 200 mg., toxic effects were insignificant in the present series. In several cases there was a delay of two to three months before the Hb level began to rise appreciably: so it is suggested that a second course should not be given for at least three months. In the cases with a good initial response no further iron has been given by any route, but experience may show that where the Hb does not reach 90%, or where it subsequently falls below this level, a second course should be given.

We suggest that cases which respond poorly should receive a second, and if necessary a third, course. Slack and Wilkinson observe "that in chronic infection there is a greatly increased demand for iron by the cell systems of the body and that very large amounts of iron must be provided to enable the bone-marrow to obtain sufficient for its purposes and to maintain a normal plasma-iron level."

It is noteworthy that in the cases which responded poorly the average level of the E.S.R. on admission was high and remained high, in contrast to the cases with good response where the average level of the E.S.R. was low and fell lower after treatment.

SUMMARY

Ferrivenin was used in 23 cases of rheumatoid arthritis with iron-deficiency anæmia which did not respond to a month's treatment with iron by mouth in the form of fersolate gr. 3–6 thrice daily.

Of these 23, 16 responded well and 7 (including 2 when a second course was given) poorly.

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LEAD POISONING IN AN INFANT FROM LEAD NIPPLE-SHIELDS

ASSOCIATION WITH RICKETS

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AMERICAN workers have emphasised that, unless we bear lead poisoning in mind, lead encephalopathy in young children is likely to be missed. Lead encephalopathy in nursing infants was first described in a Japanese monograph in 1784 (cited by Kato 1932) as "meningitis of unknown ætiology"; many years later Japanese workers demonstrated that this meningitis was in fact lead encephalopathy. We describe here a case of lead encephalopathy in a breast-fed infant whose mother had used lead nipple-shields, and it seems likely that similar cases are escaping recognition.

SOURCES OF LEAD POISONING

Sources of lead poisoning in nursing infants are many and various. Le Grand and Winter (cited by Dufour-Labastide 1902) described two authentic cases in newborn infants whose mothers had been exposed to lead during a shallow crater was seen high on the posterior wall. A vessel in the base was plugged with clot.

As the result of these experiences, we in this unit feel that in such circumstances a high partial gastrectomy is the correct procedure. It may be urged that resection is a serious step to take when an ulcer is not proven. In the absence of a gross infiltrating lesion, however, *it can be carried through expeditiously, and in nine cases out of ten trouble-free recovery will follow.*

I would like to thank Mr. W. J. Ferguson for allowing me to take part in the treatment of these cases and for much stimulating advice.

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INTRAVENOUS IRON IN HYPOCHROMIC ANÆMIA

ASSOCIATED WITH RHEUMATOID ARTHRITIS

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THE effect on iron-deficiency anæmia of administering iron intravenously has been studied by Slack and Wilkinson (1949), who tested *two preparations:* (1) an iron-sucrose compound of pH 10·5; and (2) a proprietary preparation, 'Ferrivenin' (Benger). They noted no difference between these preparations in tolerance or response; the initial response was good in 57 of their whole series of 60 cases. The dosage recommended was 200 mg. daily or twice daily. One patient with rheumatoid arthritis received altogether 2550 mg. of iron in three separate courses before a satisfactory response was achieved.

TABLE I—HÆMOGLOBIN LEVELS IN 100 CASES OF RHEU ARTHRITIS, ON ADMISSION AND DISCHARGE

Distribution of patients	Hæmoglobin %			
	<60	61–70	71–80	81–90
On admission ..	1	6	19	28
On discharge ..	Nil	4	8	16

Govan and Scott (1949) used ferrivenin for the ment of 25 cases of anæmia associated with pregnanc dosage was 30 mg. on the first day, 60 mg. on the day, 100 mg. for five days, and then 100 mg. on all days. The hæmoglobin rose rapidly, the increase first week averaging 8%. They calculated th increase the hæmoglobin by 1% these cases re 40 mg. of elemental iron, compared with 24·5 mg. in Slack and Wilkinson's cases unassociated with nancy. Other writers (Cohen 1948, Mitchell French 1949) confirm the efficacy and low toxic ferrivenin. Nissim and Robson (1949) have pr an iron-sucrose compound which they claim is les than ferrivenin; in their experience 300 mg. or can be injected intravenously in a single dose w causing toxic reactions.

GENERAL RÉGIME

Table I shows the hæmoglobin levels on admissi discharge from hospital of 100 consecutive ca rheumatoid arthritis. The average stay in hospit six weeks, *and all patients* were on the same régime, which included full diet and vitamin concen with extra proteins if necessary. Patients with a globin below 80% were given iron by mouth in th of 'Fersolate' gr. 3, rising to gr. 6, thrice daily th *out their stay. On this régime* the hæmoglobin re below 80% in only 12% of cases. It was deci investigate the effect of intravenous iron in cases did not respond to oral iron. The results in 23 are reported here.

TABLE II—EFFECT OF FERRIVENIN ON 23 CASES OF RHEUMATOID ARTHRITIS WITH HYPOCHROMIC ANÆMIA, RESPONSE IN CASES 1–16 AND FAILURE IN CASES 17–23

Case no.	Age (yr.) and sex	Duration of symptoms (yr.)	Hæmoglobin %					E.S.R. (mm. in 1st hr.)				Gastric acidity	S n
			On admission	After 1 month on iron by mouth	Response to ferrivenin 1·05 g. i.v.			On admission	After 1 month on iron by mouth	1 month after 1·05 g. ferrivenin	Final level (time in months)		
					1 month after injection	Maximum level (time in months)	Final level (time in months)						
1	43 F	2	78	79	83	93 (3)	93 (3)	18	20	9	26 (3)	..	
2	42 F	10	77	66	87	87 (1)	86 (3)	35	12	13	47 (3)	..	N
3	38 F	21	64	72	92	92 (1)	92 (9)	94	37	42	55 (9)	Low	
4	37 F	5	65	68	80	102 (2)	101 (10)	20	20	3	8 (10)	..	
5	35 F	2	69	71	90	98 (4)	98 (4)	10	10	6	20 (4)	High	
6	63 F	1/2	80	74	96	96 (1)	87 (3)	28	4	58	73 (3)	..	
7*	38 F	2	38	..	65	76 (2)	72 (3)	32	..	60	69 (3)	Low	
8	22 F	1/4	73	76	88	93 (4)	88 (6)	67	41	10	5 (6)	..	
9	54 F	8	60	65	78	..	..	80	64	71	..	..	
10	35 M	1 1/2	65	70	82	94 (2)	78 (8)	58	35	24	42 (8)	..	
11	37 F	14	63	63	83	96 (4)	96 (4)	12	20	5	9 (4)	..	
12*	80 F	3	30	..	76	84 (4)	84 (5)	18	..	60	75 (5)	..	
13	50 F	1	84	82	97	..	..	37	12	17	..	..	
14	40 F	1/2	70	75	90	103 (5)	103 (10)	30	30	22	9 (10)	..	
15*	50 M	6	62	..	75	84 (6)	84 (6)	78	..	83	4 (6)	Low	N
16	43 F	1/4	74	86	92	96 (5)	96 (3)	33	21	28	28 (5)	..	
17	53 F	12	82	82	84	..	..	38	70	60	..	..	
18	51 F	3	74	71	80	80 (1)	78 (2)	79	95	81	78 (2)	Normal	
19	63 F	8	76	78	80	80 (1)	75 (3)	65	37	78	65 (3)	..	
20	57 F	9	78	82	80	87 (3)	80 (4)	16	14	17	10 (4)	..	
21	55 F	1/2	65	60	64	70 (5)	70 (5)	40	80	118	90 (5)	High	N
22†	29 F	13	75	80	84	86 (2)	78 (4)	21	20	23	40 (4)	Normal	
			2nd course		83	83 (1)	79 (3)	..	..	19	62 (3)	..	
23†	69 M	2	62	62	75	78 (2)	78 (2)	100	90	13	38 (2)	Low	N
			2nd course		85	85 (1)	75 (2)	..	..	78	86 (2)	..	

* Intravenous iron administered without the initial period on iron by mouth.
† Two courses of intravenous iron.

ng of the ribs and broadening of the lower end of the s, but no craniotabes. The heart and lungs were al, and the blood-pressure was 88/50 mm. Hg. The extended two finger-breadths below the right costal n.

mbar puncture was done two hours after admission. C.S.F. was xanthochromic and contained 18 cells per (1 polymorph and 17 lymphocytes); protein 150 mg., 62 mg., and chlorides 720 mg. per 100 ml. The Nonne- test for globulin was positive, and the Pandy test ly positive. No tubercle bacilli were seen in a direct

ese findings tended to exclude tuberculous meningitis; other cause for the convulsions was sought, and it was elicited from the mother that she had been using lead e-shields continuously since the birth of the baby, ut cleaning her nipples before each feed. She was hy and well-nourished, without any signs or symptoms d poisoning.

ood examination of the baby showed red cells 3,300,000 mm., Hb 56% (Haldane), colour-index 0·85, and white 13,200 per c.mm. (polymorphs 18%, eosinophils 2%, phils 1%, lymphocytes 78%, monocytes 1%). The red showed moderate hypochromia; 2% were stippled cells, 12·6% reticulocytes. There was one normoblast per white cells.

ood-chemistry: serum-calcium 10·7 mg., serum-inorganic phorus 3·2 mg., serum-alkaline phosphatase 32 units, and d-urea 20 mg. per 100 ml. A blood-culture was negative.

ine contained a faint trace of protein and three pus cells high-power field.

ogress and Treatment.—On April 18 the infant was still iting and constipated. His anterior fontanelle was tense pulsating. A subdural tap was done, 2 ml. of fluid was ved from the left side, and 1 ml. from the right. This was xanthochromatic and similar in all respects to the . obtained by lumbar puncture. Further lumbar punc- s were done on April 19, 20, and 21, and 15, 30, and 20 ml. S.F. was removed. The indications for lumbar puncture a tense fontanelle, vomiting, and increased squint. ecimen of C.S.F. examined on May 4 was normal. From l 21 the infant steadily gained weight, though from l 17 to April 23 his stools were green but not loose or uent.

n assay of the amount of lead in the blood on April 23 days after admission) showed 1·9 µg. of lead per g. of d, whereas in the blood of a control infant of the same there was no lead. No lead was found on polarographic ysis of a seven-day specimen of urine on April 30.

loral hydrate gr. 2 was given four-hourly for the con- ions, and the infant was taken off the breast and put on cream National dried milk and vitamin D 4500 I.U .

n discharge on May 16, 1949, the infant weighed 14 lb. 5 oz.

ollow-up.—Three months later the infant showed satis- ory progress, and seemed to be normally intelligent. All clinical signs of rickets had also improved.

adiologist's Report (Dr. C. J. C. G. Hodson).—On admission utine film of the chest showed the unusual combination of e bone and florid rachitic changes. So the skeleton was ographed daily. After only six days' treatment with I.U. of vitamin D daily the bones were stout and within nal limits as regards maturity. The usual absence of p definition between cortex and medulla found in advanced ets was present, with well-marked subperiosteal new bone ation along the concave curves of the tibiæ. The hyses generally were much splayed, and the lower ends he tibiæ showed the usual varus deformity. The juxta- hyseal new bone was ragged, irregularly "calcified," and h denser than is usually found in untreated rickets of this rity. The bone trabeculæ in the shafts were also more que than is usual in such cases. The skull showed a big rior fontanelle and an early beaten-copper appearance ch is uncommon at this age and might again be an ession of increased bone density. The dentition appeared mal. There was thus no doubt that a severe rachitic nge was present, but combined with this was an increased sity of mineralised bone throughout the skeleton, which presumably due to the deposition of a salt of a higher mic number than calcium.

The next series of films (May 2) showed a considerable change. The newly mineralised tissue adjacent to the epiphyses was extraordinarily dense and showed a rapid response to treatment. This was particularly well seen in the anterior ends of the ribs and lower femoral epiphyses. In the later films this dense new bone was very well seen as dense bands bordering both the diaphyseal and epiphyseal sides of the epiphyseal lines, and in the subperiosteal new bone. In July the bones had almost returned to normal except for their widened ends, but one or two dense lines remained parallel to the epiphyses, and the juxta-epiphyseal layers were still much denser than normal. The process can be summed up as representing a normal good response to anti-rachitic treatment, but with the deposition of a salt of high atomic weight in the bone thus formed.

ABSORPTION OF LEAD FROM NIPPLE-SHIELDS

There are several routes by which lead might have been absorbed by the infant from nipple-shields worn by the mother.

(1) *Ingestion of Metallic Lead from Deposit on the Mother's Nipple.*—Rubbing of the shields with the finger, using comparatively light pressure, removed finely divided lead. This was demonstrated not only in new shields but also in shields that had been worn for several months. The lead deposited was difficult to remove entirely from the finger even by vigorous rubbing with moist gauze. Thus gentle cleaning of the nipple just before a feed may not completely remove all the deposit of lead, and this may be absorbed by the infant.

(2) *Ingestion of a Deposit of Lead Salts on the Nipple.*—Lead may be dissolved from the shields by the mother's milk, which collects inside the shield, particularly after it has been acted on by acid-producing bacteria. The following experiment demonstrated that this was possible. A new clean nipple-shield was partly immersed in about 20 ml. of breast-milk inoculated with *Bact. coli* and was kept for forty-eight hours at 37°C. About a third of the total surface of the shield was in contact with the milk. After incubation the milk was poured off, and the total lead content of this milk, determined by polarography, was 0·74 mg. Shields which had been in use for some time had a white deposit on the inner surface; when this was disturbed with a soft swab, using minimal pressure, and then washed off the shield with water, lead could readily be detected qualitatively in the washings.

(3) *Absorption of Lead through Mucosa of the Nipple, and Excretion of it in the Breast-milk.*—This is possible but was not investigated. It has been reported that a mother who had used lead nipple-shields continued to excrete lead in her milk for over a week after the shields had been discarded (Holt and Howland 1940).

COMPOSITION OF SHIELDS

Three pairs of metallic shields obtained from different sources contained a very high proportion of lead. It is believed that a tin lead alloy is sometimes used, but a full analysis of the metals present was not made.

DISCUSSION

Florid rickets in a breast-fed infant of normal birth weight is rare in this country today. Though the present infant had not received cod-liver oil compound or other rich source of vitamin D he had been out daily during the winter and spring. During pregnancy and lactation his mother had received an ordinary full diet, which should have provided a considerable degree of protection. The infant's response to vitamin D excluded a vitamin-resistant rickets, the normal urinary findings and blood-urea level excluded a renal cause, and there was no evidence of cœliac disease. It was thought that the lead poisoning might have been a factor in causing pregnancy. Dufour-Labastide (1902) recorded several cases of poisoning in infants due to secretion of lead in the breast-milk of mothers poisoned by skin cosmetics and hair-dyes. Other sources are lead in face powder used by the mother and in ointment applied to the breast (Holt 1923, Vahlquist and Sälde 1943); feeding-bottles made of glass containing lead, and feeding-bottle stoppers made of metallic lead or of rubber containing lead (Dufour-Labastide 1902); lead plasters and lead dusting-powders applied to the infant's skin (Freedman and Stephenson, cited by Dufour-Labastide 1902); printers' lead type swallowed by the infant (Variot and Remy 1894); and fumes inhaled from burning battery cases (Williams et al. 1933). Lead poisoning from nipple-shields used by the mother seems to have been described first by Cadman in Yorkshire in 1902, and then by Wilcox and Caffey (1926) and Rapaport and Kenney (1939) in America.

FACTORS INFLUENCING DEVELOPMENT OF CHRONIC LEAD POISONING IN CHILDREN EXPOSED TO LEAD

Various factors influencing the development of lead poisoning have been discussed in previous case-reports.

Age.—Infants and children show particular susceptibility to lead poisoning. In a group of 40 cases of lead poisoning in Boston due to the burning of storage batteries, only 2 of the patients were adults, in spite of the fact that children and adults alike were exposed to the fumes (Williams et al. 1933).

Duration of Exposure.

Idiosyncrasy.

Season.—It has often been observed that lead encephalopathy is more frequent in the late spring months. Blackman (1937) thought this was due to a rise in the environmental temperature, but Rapaport and Rubin (1941) suggested that sunlight, by producing vitamin D, probably increased the amount of lead absorbed from the gastro-intestinal tract during exposure to sources of lead. The photosensitising action of sunlight on porphyrins, which are increased in lead poisoning, may play a minor rôle in contributing to the severity of plumbism; this possibility has been supported by experiments on animals (Rapaport and Rubin 1941).

Diet.—Kato (1932) stated that lead poisoning is more common in breast-fed infants than in artificially fed infants. This he ascribed to cows' milk having a higher content of calcium than breast-milk. Another possible explanation might be more frequent exposure of breast-fed infants to sources of lead.

SYMPTOMS AND SIGNS OF CHRONIC LEAD POISONING IN INFANTS

The infant with lead poisoning is generally taken to the doctor because of signs of encephalopathy. Common signs are fretfulness, irritability, sleeplessness, convulsions, vomiting, a tense fontanelle, and opisthotonos. Ocular changes, such as papillœdema, optic atrophy, and *optic neuritis may develop. Peripheral neuritis* in infants is very rare. The infant may have slight pyrexia with a temperature range of 98–101°F. Anorexia is common and, if severe, may lead to failure to gain weight and to emaciation. Other clinical features may be bleeding gums, foul breath, and a dark discoloration of the teeth or tongue. A lead line in the gums is rarely seen. Pallor is usually present early and is due to contraction of the skin capillaries; later a true anæmia develops. There may be a rapid pulse and mild diarrhœa, with dark-green stools; this colour is thought to result from the interaction of hydrogen sulphide, lead, and bile in the bowel.

LABORATORY INVESTIGATIONS

The blood shows a moderate anæmia, punc basophilia, and reticulocytosis. Other changes n include Cabot's rings, normoblasts, and a sl leucocytosis with a normal differential count.

The cerebrospinal fluid (C.S.F.) is under pressure; may be clear or xanthochromic, and may form a pel on standing. There is an increase of protein, and th may be a slight increase of the cell-count (10–25 c.mm.) with lymphocytes predominating.

Biochemical findings which may help in diagnosis lead in the urine, an increased level of lead in the bloo and lead in the hair and nails.

Radiography of the long bones in affected inf usually shows a characteristic dense line or band at epiphyses (Park et al. 1931).

PROGNOSIS AND SEQUELÆ

The prognosis of lead poisoning in infancy is extrem bad. Holt (cited by Ford 1944) reported that 13 of infants with chronic lead poisoning died within a sh period; of the 7 survivors only 1 was restored to norm mental and physical health; the other 6 were left wi mental defect or other neurological lesions. In a ser of cases reported by Kawamura (cited by Kato 19 there was a mortality-rate of 50% and complete recov in only 10%. Levinson and Zeldes (1939) reported th of 26 infants with lead poisoning, 5 died (4 in the ac stage, and 1 a week later); of the 21 survivors 9 w followed for from 4 months to $3^{1}/_{4}$ years; 3 remain in good health; 2 had frequent headaches (1 of th had partial optic atrophy); 1 had frequent abdom pains; 1 was blind, mute, and unable to walk; and had recurrent headaches and were mentally retard Other sequelæ, such as hemiplegia and bilateral weakn of the limbs, were described by Ford (1944).

CASE-RECORD

A male infant, aged 6 months, weighing 13 lb. 2 oz, admitted to the Queen Elizabeth Hospital for Children April 14, 1949. He had been wholly breast-fed until a days before, and had never been given cod-liver oil or ora juice, but had been out of doors daily during the wi months. He was admitted as a possible case of tubercul meningitis. He had had irregular bouts of vomiting du the previous fortnight and convulsions in the previous days. During the preceding month the mother had note slight change in his temperament; he smiled less and t less note of his surroundings.

Past History and Family History.—He had been b weighing 6 lb. 4 oz. after a normal labour. He had no hist of other illness or of head injury. His parents were said be quite well. An aunt of his mother's had died tuberculosis but had never been in contact with him, and mother's brother, aged 16, was being "watched" tuberculosis.

Maternal Diet.—During pregnancy and lactation the mot had had her full rations. She used to sit in the sun whene possible but took no iron or vitamin preparations.

On admission the infant had an attack in which he vomit "went waxy-white, and developed a squint in the right e Immediately after this there was definite *twitching* of right side of the face and right arm. Soon after admis he had a generalised convulsion, and his eyes showed conju deviation to the left and upwards. After the convuls nystagmus in both lateral directions was present, and infant was lethargic though conscious.

His general nutrition was good, and temperature norm but he was pale. The anterior fontanelle was bulging, ten and pulsating; there was possibly some scaphocephaly a slight separation of the sutures. Veins in the left tempo region were prominent and congested. All reflexes w present and equal. Chvostek's and Trousseau's signs w negative. The ocular fundi were normal. There was internal squint of the right eye. There was well-mark rork had been concerned solely with book-keeping and red no hazard of lead absorption. Her sister, who lived same house, had a urinary lead level within normal limits ormal blood. The urinary lead level and blood of another it with a similar skin condition in the ward at the same were also normal. The patient's blood-urea level was g. per 100 ml. Wassermann and Kahn reactions were ive.

atment.—It was decided to investigate and treat the nt as a case of chronic lead poisoning.

ad dressings were removed, and no further lead was ed. "De-leading" treatment was given. A low-calcium was started, and ammonium chloride gr. 75 was given by mouth. Intramuscular 'Parathormone' 50 units was given for five days. During this treatment daily led and reticulocyte counts were made. Daily 24-hour mens of urine were collected in acid-washed 'Pyrex' iners for the estimation of urinary lead. Blood-calcium were determined on three occasions (Kramer and ll's (1921, 1923) method as modified by Trevan and bridge (1926)). The patient was kept under careful vation during the administration of the parathyroid ct. These injections were discontinued on the fifth day g to a complaint of paræsthesiæ in arms and legs and mbness in the right thumb and forefinger. Clinically no tive abnormality of the central nervous system was d.

ter the fifth day of treatment the level of urinary lead n to fall very rapidly without any previous significant fig. 1). The level of 0·44 mg. per litre was attained on the the patient complained of paræsthesiæ in her limbs.

matological Findings.—On Dec. 7, 1948, examination of blood showed Hb 9·47 g. per 100 ml. (64% Haldane), cells 4,620,000 per c.mm., colour-index 0 69, and white 5600 per c.mm. (neutrophils 50%, eosinophils 11%, phils 1%, lymphocytes 37%, monocytes 1%); hæmato-reading 35%; erythrocyte-sedimentation rate 4 mm. in ur (Wintrobe); mean corpuscular volume 78 c.μ; mean uscular hæmoglobin concentration 29%. One normoblast C) was found per 100 white cells. The red cells showed chromia, with slight anisocytosis and poikilocytosis. ctate basophilia was well-marked; this had not been rved in a blood examination some months before. These led cells formed 3% of the red cells—i.e., 30,000 per 0,000 red cells—a grossly abnormal figure. The stippling coarse, granular, and similar to that seen in a proved case oisoning in a lead worker under observation at the same . Lane (1931) states that, in a lead worker, a count of 3000 led cells per 1,000,000 red cells is of no pathological ficance but merely suggests that the person follows that pation; higher counts are definitely pathological, cially if the stippling is coarse. McCord et al. (1935) ider that more than 3000 stippled cells per 1,000,000 cells is usually evidence of lead intoxication. The stippled it in our patient, who had had no known contact with apart from lead in dressings, was therefore very ificant.

derocytes were looked for by the prussian-blue method, none was found. Further, staining with basic fuchsin as a nuclear stain and counterstaining with light green did not show any stippling. This indicated that we were dealing with punctate basophilia and not with nuclear remnants—e.g., Howell-Jolly bodies.

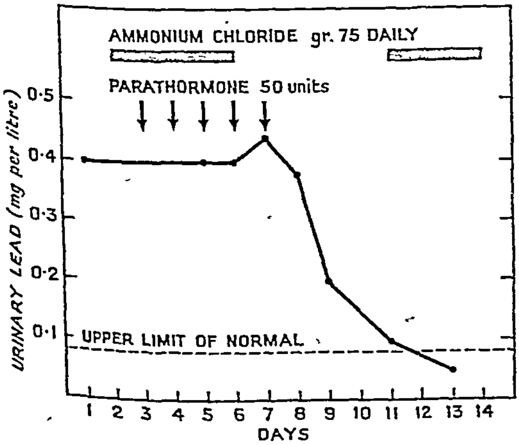

Fig. 1—Urinary excretion of lead.

Assuming that stippling is, with polychromasia, a manifestation of reticulation (Whitby and Britton 1933), we made daily reticulocyte and stippled counts during the treatment. The results are shown in fig. 2. It was noted that the stippled pattern tended to become finer as the count fell during treatment. The roughly parallel fall seemed to indicate that the toxic agent was being eliminated. Such a result might be expected in a case of lead intoxication responding to treatment.

Progress.—Under the régime of treatment outlined above certain symptoms showed striking improvement: the abdominal colic disappeared; the bowels became regular; the appetite returned to normal; nausea and vomiting were greatly improved; and the patient's mental outlook became better. Insomnia was still troublesome, but less so than before treatment. Headaches were now only occasional.

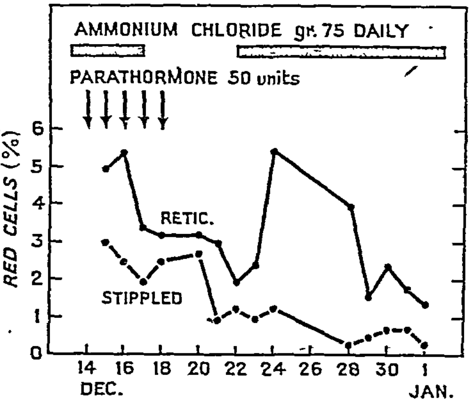

Fig. 2—Reticulocyte and stippled counts.

DISCUSSION

Lead poisoning by absorption of lead through the skin is rare. In the present case one must assume that lead was absorbed through a damaged skin. Teleky cited by Heffter and Heubner 1934) estimates that 1 mg. of lead ingested daily for some months will produce poisoning. Sollmann (1922) holds that daily ingestion of 10–20 mg. of lead for several weeks will lead to clinical plumbism. In our case it is estimated that 1400 mg. of inorganic lead was applied daily for sixteen weeks.

Cutaneous absorption of lead has recently been demonstrated in rats by Laug and Kuntze (1948). Volatile tetra-ethyl lead penetrated the skin in twenty-four hours with relative ease, whereas non-volatile lead compounds did so in very small quantities. Mechanical injury to the skin increased the absorption of both volatile and non-volatile lead compounds. Though these experiments on rats may not apply to the intact human skin, possibly a damaged human skin in contact with lead for a long time will permit the absorption of a dangerous quantity of lead.

We felt justified in trying to de-lead this patient because no large storage of lead in the body was anticipated. Belknap (1935) de-leads mild cases in ambulant patients under close supervision, but "most authorities feel that the de-leading should be carried out only in the hospital and with adequate laboratory checks" (Johnstone 1941).

The insignificant rise in the urinary lead level before the return to a normal figure can be explained by (1) a relatively small excess of lead in the body, with little or no storage in the bones, and (2) excretion of the bulk of the lead in the fæces. Aliavdin and Peregood (1936) have shown that the level of lead in the duodenal juice the rickets. If the lead precipitated the phosphorus of the breast-milk in the gut, the infant might have suffered from phosphorus deficiency, but the quantity of lead swallowed would have to be very large to allow of such a mechanism.

We have found only one definite published case of lead poisoning associated with rickets; this was due to lead acetate applied to the mother's breast (Holt 1923). Another case with possible rickets was published by Norton (1922), who described the baby as "having an asymmetrical head with frontal and parietal bossing, more marked on the right than the left side." These cases, however, occurred at a time when rickets was much more common. Many cases of lead poisoning have been described in the Japanese series (see Kato 1932), but no reference is made to any association with rickets.

Wilcox and Caffey (1926) and Rapaport and Kenney (1939) described cases of lead poisoning due to lead nipple-shields. This method of treating the nipples of a lactating mother was thought by many pædiatricians to be obsolete, but lead nipple-shields are still quite widely used in maternity homes and hospitals. Lead nipple-shields have been advocated by DeLee (1933), Edgar (1926), Schumann (1936), and Naish (1948) for the treatment of diseased nipples, and the manufacturers emphasise their complete harmlessness to the infant.

Wilcox and Caffey (1926) state: "The lead nipple-shield is a definite source of danger to the nursing infant if used for longer periods than 2–3 weeks"; but in our view these shields should not be used in any circumstances whatsoever, since the risk of lead poisoning, with its high mortality, is too serious to take. Shields made of plastic, or other non-poisonous substances, will be safe and equally effective.

SUMMARY

A case of lead poisoning in an infant whose mother had used lead nipple-shields during lactation is described.

The lead poisoning was associated with rickets.

The serious prognosis and sequelæ of lead poisoning in infants are emphasised.

The probable mode of absorption of the lead from the nipples by the infant is discussed.

In view of the risk of poisoning, lead nipple-shields should never be used.

We wish to thank Dr. H. M. M. Mackay for her help, guidance, and permission to publish the case; Dr. Donald Hunter and Dr. B. Levin for their advice and help; and the staff of the X-ray department and the nurses for their invaluable assistance.

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LEAD POISONING BY CUTANEOUS ABSORPTION FROM LEAD DRESSIN

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LEAD poisoning from the absorption of non-vol lead compounds through the skin is very rare. In 1 Tanquerel des Planches referred to poisoning thro the application of lead-containing lotions and ointm to ulcers, sores, and inflamed skin; and more rece poisoning from cosmetic preparations has been repo by Woltman (1922) and Soewarno (1930). Conway (1 has written of cases of poisoning in babies in the Ori in these cases large quantities of white lead had b applied to the mothers' faces, necks, and breasts, to the infants themselves. Lead poisoning from dye has been recorded by Valdiquié and Planque (1 in France, Smith (1932) in America, and Busacca (1 and Pichezzi (1935) in Italy. Bartleman and Du (1936) published the case of an actress who develop chronic lead poisoning from theatrical grease-pa Matz (1942) described poisoning in a child caused plaster of lead oleate (diachylon) applied to the ski he found only three cases previously recorded due this substance.

CASE-RECORD

Miss A, aged 46, a clerk, was admitted to the Royal Victo Hospital, Belfast, in March, 1948, with generalised exfoliat dermatitis of eight months' duration. Apart from m *depression and tiredness there were no subjective* symptom General treatment in hospital took the form of a supplement high-protein diet and suitable mild sedation. Local treatm consisted in the application of various dressings to the enti body surface. These dressings included lead in the form 2% liq. plumbi subacet. fort. *B.P.*; lotio calamin. co.; cremor zinci, *N.W.F.*; and lotio pic. et plumb. (*Bel Hospitals' Pharmacopœia*).* These lead dressings were appl intermittently from May to December, during which perio lead in some form or other was in contact with th skin for about sixteen weeks. Mild lead intoxicatio resulted.

In November, 1948, seven months after admission, the sk showed definite improvement, but the patient complain of new symptoms, including nausea and vomiting, colic abdominal pain, constipation, nervousness, headache, slee lessness, and loss of appetite. The pain was severe, circu umbilical (radiating towards the epigastrium), inconstan colicky, and most severe after meals, when the patient of vomited a little. Alkalis did not give relief. Constipation w severe, and enemas were given almost daily in the fortnig preceding the onset of the pain. The headache was continuou frontal, and different from any headache the patient had ev had before.

On examination the patient was very thin, with pale fa and conjunctiva, and an ashen hue below the eyes. Her who body was covered with exfoliative dermatitis. There was significant abnormality of heart, lungs, or central nervo system. The liver extended to a finger-breadth below t costal margin; no abdominal tenderness was elicited. Slig œdema of the ankles was present. *The menses* had cea some years previously. The patient was edentulous. H blood-pressure was 145/75.

Blood Examination.—In early December, 1948, there w widespread stippling of the red cells (see below). This puncta basophilia was so conspicuous that urinary lead was estimate The lead level in a 24-hour specimen of urine was determin by the dithizone method of Ross and Lucas (1935) and Keh et al. (1935). Kehoe estimates 0·04 mg. per litre as a me normal (Johnstone 1941), and a reading as high as 0·1 m per litre is considered by most authorities the upper limit normal. Urinary lead in the present case was 0·4 mg. per litr which is four times the accepted upper limit of normal. Th patient had been previously employed as a clerk in a laundr

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* Liq. pic. carbon., 60 min.; liq. plumbi subacet. fort. 60 min. aq. dest. to 4 fluid oz.

E I—NINE ASSAYS ON EACH OF 11 SAMPLES OF C.S.F. OBTAINED BY VENTRICULAR PUNCTURE SIX HOURS AFTER A SINGLE INTRAMUSCULAR INJECTION OF PENICILLIN

Sex	Age (yr.)	Diagnosis	Dose of penicillin (O.U.)	C.S.F. findings				No. of assays giving C.S.F.-penicillin level (unit per ml.)					Mean of 9 assays (unit per ml.)
				Pressure	Red cells per c.mm.	White cells per c.mm.	Protein (mg. per 100 ml.)	0–0 037	0 037–0 06	0 06–0·125	0 125–0·25	0·25–0 5	
F	34	Headache; no tumour found	500,000	N	500	10	10	6	3	..	..	..	..
F	46	Idiopathic epilepsy	500,000	N	2000	10	25	7	2	..	..	..	..
F	25	Frontal cholesteatoma removed 1946	500,000	N	150	10	10	9	..	..	..	..	..
M	57	Pituitary adenoma	500,000	N	Not analysed			9	..	..	..	..	..
M	48	Left parietal angioma ..	100,000	N	30	5	10	1	3	5	..	..	0 07
M	59	Meningioma (preoperative) ..	100,000	N	20	5	10	..	..	3	6	..	0·16
F	47	Meningioma removed 1946 ..	100,000	N	10	10	10	..	..	..	4	5	0·29
M	40	Toxic hydrocephalus ..	200,000	N	1400	7	10	..	..	9	..	..	0 09
F	55	Right parietal meningioma..	200,000	H	30	5	20	..	..	..	9	..	0·18
F	27	Optic neuritis..	200,000	N	800	8	10	..	..	9	..	..	0 09
M	56	Coronary thrombosis; cerebral arteriosclerosis	200,000	N	500	25	10	..	..	9	..	..	0 09

N, normal.

s (2 mega-units) in single intramuscular doses without ctable toxic effect. In our patients receiving peni- therapy there was the usual small proportion of ersensitivity phenomena.

METHOD OF ASSAY

he technique used was a modification of the capillary- serial-dilution method described by Fleming and th (1947). In this method a penicillin sensitive hæmo- streptococcus actively ferments glucose with the luction of acid, which is detected with phenol red. oughout the investigation the organism used remained sensitive to standard solutions of penicillin $^1/_{32}$ unit ml. When medium and C.S.F. were used in equal imes, the minimal detectable level of penicillin was $^1/_{15}$ unit per ml. To detect lower levels a five-times entrated medium was used, enabling penicillin levels 037 unit per ml. to be detected. A specimen could be reported as containing one of the following ls of penicillin: up to 0·037 unit per ml.; 0 037–0 062 unit per ml.; 0 062–0·125 unit per ml.; 0·125–0·25 unit per ml.; or 0·25–0·5 unit per ml. For a while it was impossible to put up the most sensitive tube containing the concentrated medium; for this reason some values of 0–0 062 unit per ml. were reported.

Several control studies were made to assess the reliability of the method. Of 15 specimens of C.S.F. known to be free from penicillin and submitted for assay none gave a false positive. Samples of C.S.F. containing known levels of standard penicillin were assayed in duplicate. Correct reports were returned in 11 out of 14 assays; the largest error was in reporting a specimen containing 0·15 unit per ml. as containing 0·06–0·125 unit per ml. Finally, C.S.F. was obtained from 11 patients by ventricular puncture six hours after large intramuscular doses of penicillin (0 5–2 mega-units). Each sample was assayed nine times, and each assay included a penicillinase control. None of the 99 control tubes gave a false positive (lack of growth of the organism in the presence of penicillinase). The results of these assays are shown in table I.

LE III—PATIENTS WITH NEUROSYPHILIS WHO RECEIVED EITHER 1, 2, OR 3 FIVE-DAY COURSES OF PENICILLIN (COURSE A, B, AND C) AT ABOUT MONTHLY INTERVALS

	Age (yr.)	Sex	C.S.F. before treatment			C S.F.-penicillin level					
			Cells per c.mm.	Protein (mg. per 100 ml.)	Lange reaction	Course A		Course B		Course C	
						12 hr.	84 hr.	12 hr.	84 hr.	12 hr.	84 hr.
8	57	M	14	50	1122210000	+ +	− + + +	..	.	..	..
9	46	F	6	50	5554321000	+ +	+ +	+ +M	+M	..	..
0	40	M	88	180	5555543210	+	+ +	+ −M	..	..	..
1	55	M	9	50	5554321000	0	0	+M	+M	..	..
2	42	M	6	180	5555554321	− +	+ +	+ − M	+ −M	− −	− +
3	56	M	32	95	5554321100	−	+	...	..	..	..
4	24	F	10	130	5555432100	− − +	− +	0 M	−M	0	..
5	19	F	2	25	Negative	+	+	+ −C	..	..	..
6	41	F	40	40	5555432100	+	− +	− + +C	..	..	..
7	59	M	13	45	0012332100	+ + − +	+ + +	..	..	..	..
8	33	M	13	45	4555533211	+ + − +	− + − +	+ + +M	..	..	..

Dosage 0 5 mega-unit intramuscularly every four hours. Courses A and C consisted of penicillin alone. During course B 6 of the patients e having B.T. malarial rigors above 103°F. and 2 of the patients were receiving 4 g. of caronamide every four hours, starting four s before penicillin was started (specimens marked M and C respectively in the column "Course B"). Two lumbar punctures performed during each course, twelve hours and eighty-four hours after the course started.

may be 10–30 times as high as in the urine. Experiments on animals have shown that the higher lead level in the duodenum is due to the presence of bile (Behrens, B. and Baumann, A. cited by Cantarow and Trumper 1944). In addition to excretion of lead in the bile, the large intestine appears to be the chief route by which lead leaves the body, which is also the case with other heavy metals. Determination of the quantity of lead in the fæces is of little practical value, and no estimations were made in the present case.

Unfortunately only three blood-calcium estimations were made during treatment. The day after the second injection of parathormone the blood-calcium level was 9 mg. per 100 ml. After the fourth injection it was 8 mg., and two days after the fifth and last injection it was 7·6 mg. We are at a loss to explain this fall in the blood-calcium. However, failure of the blood-calcium level to rise above the normal figure in similar circumstances is not without precedent. Hunter and Aub (1927) made observations on the blood of six patients with lead poisoning treated with parathyroid extract. In one of these cases there was no rise in blood-calcium after treatment for fifteen days with an average daily dose of 65 units, but the total output of calcium was increased. This illustrates that increased excretion of calcium does not depend on a raised blood-calcium level.

We feel that the evidence for lead poisoning in our patient is strong. The damaged skin over the whole body could not have formed an efficient barrier to the absorption of lead from the long-applied lead dressings. The symptoms and signs at the end of this period could have been due to mild lead intoxication. The striking punctate basophilia is very strong evidence of plumbism. This hæmatological finding is common in certain other conditions, but only in lead poisoning does one find the coarse pattern and high stippled count noted in the present case. The initial count of 30,000 stippled cells per 1,000,000 red cells is ten times what some authorities regard as the "danger line" figure in lead workers. With a figure of 3000 stippled cells per 1,000,000 red cells the worker is removed temporarily from the lead hazard. The first urinary lead figure was four times the upper limit of normal. Finally, when lead was eliminated, there was a decided clinical improvement, a return to normal of the urine, and the disappearance of punctate basophilia.

We emphasise the danger of applying lead dressings for a long period to a damaged skin; also the protean character of lead poisoning, and in mild cases the lack of "classical" signs and symptoms of the older textbooks.

SUMMARY

A case of generalised exfoliative dermatitis showing mild lead intoxication is reported. Intoxication followed the application of lead dressings (chiefly liq. plumbi subacet. fort. *B.P.*) to the whole body surface for about sixteen weeks.

The urinary lead level was 0·4 mg. per litre (four times the upper limit of normal).

Punctate basophilia was striking; the first stippled count was 3%, representing 30,000 stippled cells per 1,000,000 red cells.

Stippling of the red cells disappeared and the urinary lead returned to within normal limits after removal of the lead dressings and treatment with a low-calcium diet, ammonium chloride by mouth, and injections of parathormone.

The rarity of lead poisoning by cutaneous absorption of non-volatile lead compounds is emphasised. Other cases are cited.

We wish to thank Dr. Ivan H. McCaw for permission to publish this case, and Dr. M. G. Nelson for advice and encouragement.

References at foot of next column

PENICILLIN IN THE CEREBROSPINA FLUID

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UNTIL recently the uninflamed blood-cerebrospi fluid (C.S.F.) barrier has been regarded as imperme to penicillin.

Cairns (1947) stated that penicillin given parenterally d not enter the cerebrospinal fluid. Rammelkamp and Ke (1945), Kaplan et al. (1946), Ory et al. (1945), and Neym et al. (1945) all reported negative findings. Walker a Johnson (1946) categorically denied that penicillin can p into the normal ventricular system: they dismiss impor previous positive findings (McDermott and Nelson 19 Schwemlein et al. 1946) on the grounds of abnormaliti e.g., syphilis—in the patients studied, which might incr the permeability of the membrane.

We present here sufficient evidence to show that normal barrier is permeable to penicillin, and that th permeability is increased by organic disease of the centr nervous system, such as neurosyphilis. The negati findings previously reported are, we think, attributa to the small doses used and the difficulty of detec penicillin in low concentration, especially in the C.S.F.

Previous investigators have used specimens of C only from patients undergoing routine treatment w penicillin. In the present investigation penicillin h been administered to patients undergoing routine di nostic lumbar, cisternal, and ventricular puncture. T seemed justifiable so long as toxic symptoms did n develop as a result of the large doses of penicillin. far as we are aware, the dose of penicillin toxic to m has not been determined, but we have given 2,000,0

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.S.F. Among these 11 were 2 depressives, 1 psycho- and 1 schizophrenic. The C.S.F.-penicillin levels as follows:

penicillin t per ml.)	0–0·037	0·037–0·062	0·062–0·125	0·125–0·25
specimens	5	7	4	0

e findings in the cases of neurosyphilis are shown in III. Case 55, though not proved to have involve- of the nervous system, has been included in the to show the effects of ‘Caronamide.’ Comparing esults in the first column of penicillin levels with of the group of 17 patients who had had the same ge of penicillin, we see that penicillin is found more often and in larger concentrations in the syphilitics.

e nearest approach to normal controls for the nts with neurosyphilis is provided by patients from group of 17, who underwent lumbar puncture after four-hourly injections of 0·5 mega-unit each. From 17 the 10 were selected who had normal C.S.F. and emonstrable organic disease. Their diagnoses were chopathic personality, 3 schizophrenia, 2 depression, opathic epilepsy, and 1 confusional state, for which rganic cause was found. When we compare the ngs in this group with those from the 10 patients late neurosyphilis (case 55 excluded) after they had the same dosage of penicillin, we obtain the ts shown in table IV.

ABLE IV—COMPARISON OF PERMEABILITY IN NEURO- HILITICS AND A GROUP OF PATIENTS WITH NORMAL C.S.F.

—	C.S.F.-penicillin (unit per ml.)					Mean level (unit per ml.)
	0–0·037	0·037–0·06	0·06–0·125	0·125–0·25	0·25–0·5	
syphilis	1	3	3	1	2	0·14
ols ..	4	5	1	0	0	0 04

is comparison does not bear out the assumption of r et al. (1948) that the barrier permeability of their nts with neurosyphilis was not increased.

nother 4 specimens of C.S.F., from patients under tment for neurosyphilis at Horton Hospital, were ly supplied by Dr. Whelan. The patients had all receiving intramuscular penicillin 0·3 mega-unit y twenty-four hours for ten to twelve days before bar puncture. The samples of C.S.F. were taken shortly re the next injection was due. Of these 4 specimens, ontained 0·037–0·062 unit per ml., and the 4th 2–0·125 unit pér ml.

rum-penicillin levels were measured during the ses of penicillin in 6 of the neurosyphilitic cases for s of 500,000 units. The samples of blood were with- n 1 minute before injection, and 10, 20, 30, 40, 120, and 180 minutes after injection. The peak level –64 units per ml., averaging 22 units per ml., is ined about twenty minutes after injection. The age levels one hour, two hours, three hours, and hours after injection were 5, 2·5 units, 0.5 and 0·4 per ml. respectively.

ase 56 developed glycosuria, albuminuria with granu- casts, and microscopic hæmaturia twenty-four hours r the start of caronamide administration. Caronamide stopped, and the urine became normal over the t four or five days. There were no symptoms.

DISCUSSION

eability in Persons without Disease of Central Nervous tem

he present material contains enough persons without gnisable disease of the central nervous system to w that the normal blood-C.S.F. barrier is permeable penicillin. It includes people who had headaches without demonstrable organic cause, vomiting without involvement of the central nervous system, psychopathic personality, schizophrenia, and depression, who yielded positive findings.

Relation of Permeability to Disease of Central Nervous System

Boger et al. (1948) assayed the penicillin in the C.S.F. in cases of general paralysis of the insane after 5 days' treatment with intramuscular penicillin 0·1 mega-unit three-hourly. Their findings, compared with the present findings after three and a half days at 0·5 mega-unit four-hourly, are shown in table V.

TABLE V—PERCENTAGE OF CASES SHOWING VARIOUS C.S.F.-PENICILLIN LEVELS (UNIT PER ML.)

25 cases of Boger et al. (1948)	0–0·03 48%	0·03–0·06 48%	0·06–0·125 4%	0·125 0
Present 11 cases ..	0–0·037 9%	0·037–0·06 18%	0·06–0·125 45%	0·125 33%

The higher values obtained in the present study are presumably to be explained by the much higher dosage used and the greater severity of the syphilitic process. Boger et al. (1948) state that none of their patients had more than 25 cells per c.mm. in the C.S.F.

It has been seen that the mean C.S.F.-penicillin level in the patients who underwent lumbar puncture was about the same as for those undergoing ventricular puncture. It therefore seems probable that, four hours after the injection, penicillin is distributed fairly evenly throughout the C.S.F.

The similarity of the means for these major groups makes it permissible to group together patients with the same diagnosis, regardless of the site of puncture, whether lumbar or ventricular. It also seems justifiable to disregard the fact that some of the patients received one injection and some three injections before the C.S.F. was sampled. The mean C.S.F.-penicillin levels in the two groups who received lumbar punctures after one and three injections of 0·5 mega-unit were the same.

TABLE VI—RELATIONSHIP BETWEEN C.N.S. PATHOLOGY AND PERMEABILITY TO PENICILLIN

Diagnosis	No. of cases	C.S.F.-penicillin levels					Mean C.S.F.-penicillin level (unit per ml.)	Mean C.S.F.-protein level (mg. per 100 ml.)
		0	+	+ +	+ + +	+ + + +		
Neurologically normal (psychiatric cases, no C.N.S. findings) ..	9	3	5	1	0	0	0·04	12
Idiopathic epilepsy ..	9	4	5	0	0	0	0·04	12
Cerebral glioma ..	14	0	11	3	0	0	0·06	20
Cerebral arteriosclerosis	4	0	1	3	0	0	0·08	40
Neurosyphilis ..	10	1	3	3	1	2	0·14	80

The findings shown in table VI are taken to indicate that those pathological processes which damage vascular tissue, either locally or generally, cause larger amounts of protein and penicillin to appear in the C.S.F. But the parallelism between C.S.F.-protein and C.S.F.-penicillin levels is by no means absolute, as table II shows. Penicillin may enter the C.S.F. through the choroidal plexus. It is equally possible that it enters elsewhere by diffusing through the lining membranes of the C.S.F. system, along the Virchow-Robin spaces, or even via the connexions with the extraneural lymphatic system. The correlation between C.S.F.-penicillin and C.S.F.-protein levels suggests a similar mode of entry for the two substances. The following observation is clear evidence that penicillin penetrates disorganised tissue.

TABLE II—PATIENTS WHO RECEIVED 0·5 MEGA-UNIT OF PENICILLIN INTRAMUSCULARLY 4–6 HOURS BEFORE UNDERGOING VENTRICULAR PUNCTURE

Case no.	Specimen no.	Sex	Age (yr.)	Diagnosis	C.S.F. protein (mg. per 100 ml.)	Remarks	C.S.F.-penicillin level
70	59	M	45	Craniopharyngioma ..	10	Mastoiditis 9 months previously	+ +
71	60	M	55	Left parietal aerocele ..	20	..	+ +
72	61	F	22	Cholesteatoma	10	..	0*
73	62	M	40	Acoustic neurinoma ..	10	..	+ +
,,	63	,,	,,	,, ,, ..	10	..	+ +
74	64	M	11	Periodic hypothalamic disturbance	10	No tumour	0*
75	65	M	51	Intracranial aneurysm ..	10	..	+
76	66	F	4	Cerebellar astrocytoma..	10	..	+ +
77	67	M	50	Pituitary carcinoma ..	10	..	+ +
78	68	F	27	Neurosyphilis, pontine lesion	?	W.R. in C.S.F. negative	+ +
79	69	M	?	Cortical atrophy ..	20	..	
80	70	F	24	Cholesteatoma	10	Pyrexial 2 months postop.	0* + +
81	71	M	16	Right frontal glioma ..	20	..	
82	72	M	37	Cortical atrophy ..	10	..	
83	73	F	27	Frontal meningioma ..	10	1 yr. postop.	+ 0
84	74	M	1½	Cerebellar medulloblastoma	20	..	0
85	75	M	34	Idiopathic epilepsy ..	15	..	0
86	76	M	50	Cortical atrophy ..	10	..	
87	77	M	52	Unilateral exophthalmos	15	No tumour found	+ + +
88	78	F	26	Right frontal infective lesion	10	..	+
89	79	F	44	Suprasellar meningioma	?	..	+
90	80	F	52	Cerebral vascular incident	10	..	
91	81	F	7	Right frontal glioma ..	15	..	0
92	82	F	55	Optic atrophy of unknown cause	10	No tumour	+ + + +
93	83	F	10	Idiopathic epilepsy ..	10	..	+
94	84	F	30	Left frontal astrocytoma	10	..	
95	85	F	61	Acoustic neurinoma ..	10	..	+
96	86	F	3	Ataxia, no tumour ..	55	100 W.B.C. per c.mm. but no infection demonstrated	+ + + +
97	87	M	27	Idiopathic epilepsy ..	10	..	+
98	88	F	18	Toxic hydrocephalus ..	10	..	0
99	89	M	38	Left frontal astrocytoma	10	Cystic fluid cont. 8 units per ml.	+
100	90	M	36	Tumour of 3rd ventricle	10	..	+
101	91	M	57	Left temporal astrocytoma	60	..	+
102	92	M	47	Right cerebellar hæmangioblastoma	10	..	0
103	93	M	45	Idiopathic epilepsy ..	?	..	0
104	94	F	60	Headache	?	..	+ +
105	95	F	25	Toxic hydrocephalus ..	20	..	0
106	96	F	8	Craniopharyngioma ..	10	..	0
107	97	M	36	Left temporal astrocytoma	20	..	+ +
108	98	F	5½	Nil (vomiting)	10	..	+ +
109	99	M	2	Occipital dermoid ..	10	..	+ +
110	100	M	1	Congenital hydrocephalus	10	..	+ +
111	101	M	?	Cortical atrophy ..	?	..	+
112	102	F	48	Recurrent subarachnoid hæmorrhage	10	..	+
113	103	M	50	Left parietal cystic glioma	10	Cystic fluid cont. 0·5 unit per ml.	+
114	104	F	64	Acoustic neurinoma ..	5	..	+ + +
115	105	M	53	Right occipital glioma..	10	..	+
116	106	F	38		15	..	+
117	107	F	43		?	..	+
118	108	M	29		55	..	+
119	109	F	22	toma	10	..	+
120	110	F	55	Idiopathic epilepsy ..	10	..	+
121	111	M	21	Intraventricular glioma	10	..	+
122	112	F	21	Cerebellar medulloblastoma	10	..	+
123	113	F	43	Right frontal glioma ..	10	Postop.	+ +
124	114	M	4	Cerebellar meningioma..	5	..	0

0*, 0–0·06 unit per ml.
0, 0–0·037 ,,
+, 0·037–0·06 ,,
+ +, 0·06–0·125 ,,
+ + +, 0·25–0·5 ,,

SUMMARY OF FINDINGS (SPECIMEN 63 EXCLUDED)

C.S.F.-penicillin level (unit per ml.)	0–0·06	0–0·07	0·037–0·06	0·06–0·125	0·125–0·25	Total
No. of specimens ..	4	11	23	16	1	55

Estimated mean concentration: 0·057 unit per ml.

It is clear that the chances of a false positive are less than 1 in 100, and that many specimens taining therapeutically significant levels of penicillin be reported as negative. For example, in table I, the from cases 1, 2, and 5 was shown to contain static levels of penicillin, yet of 27 assays 14 gave a negative. This table also shows that, for the C.S.F. which all 9 assays gave positive results, the chances any single estimation being quantitatively incorrect about 1 in 5.

All specimens were transported and kept on ice assayed. Serial assays showed no loss of antibi activity over the greatest period of 48 hours during the specimens might be stored before being assayed.

No visibly bloodstained specimens were used. Micro scopic contamination up to 20,000 red cells per c.m can be neglected ; if the systemic serum-penicillin lev at the time of withdrawal of the C.S.F. is 0·5 unit per the contamination would only add 0·002 unit per to the C.S.F.

CASE-MATERIAL

There were assayed 152 samples of C.S.F. from 1 patients, of whom 97 were undergoing routine diagnos lumbar, cisternal, and ventricular puncture at th Maudsley and Atkinson Morley Hospitals. In additi there were 10 cases diagnosed as late parenchymato neurosyphilis and 1 case of congenital syphilis und treatment at the Maudsley Hospital, and 4 cases general paralysis of the insane being treated at Hort E.M.S. Hospital, Epsom.

RESULTS

The cases have been divided into groups accordin to the site from which the C.S.F. was withdrawn and th dose of penicillin received beforehand. The neurosyph litic cases have been kept separate.

From 55 patients 56 specimens (table II) of ventricul C.S.F. were obtained between four and six hours aft the intramuscular injection of penicillin 0·5 mega-uni Of these patients 40 (73%) had assayable penicillin i the C.S.F. In 6 of these cases the final diagnosis wa idiopathic epilepsy ; 4 of these had penicillin in th C.S.F. Of 13 cases of glioma all showed more than 0·03 unit of penicillin per ml.

Intramuscular penicillin 0·5 mega-unit was given 7 patients four hours before cisternal puncture. In 4 these (57%) penicillin was detected in the C.S.F. Th C.S.F. from the 1 patient who was finally diagnosed free from organic disease contained assayable penicilli

In addition 1 mega-unit was injected intramuscularl into a patient undergoing cisternal encephalography t exclude early presenile dementia. He had previousl received two lumbar punctures ten days apart, four hou after the injection of 0·5 mega-unit, and in neither these samples had penicillin been detected. Fifty minut after the injection of 1 mega-unit his cisternal C.S. contained 0·06–0·125 units of penicillin per ml. The fina diagnosis in this patient was schizophrenia.

Penicillin 0·5 mega-unit was given to 12 patients fou hours before lumbar puncture. Of these, 2 had a increased number of white cells in the C.S.F. Of th remaining 10, 5 (50%) showed assayable penicillin. A the patients in this group had gross lesions, such a prolapsed disc, cord tumour, and head injury. The C.S.F.-penicillin levels were as follows :

C.S.F.-penicillin (unit per ml.)	0–0·6	0–0·4	0·04–0·06	0·06–0·125	0·125–0·2
No. of specimens	1	4	4	2	1

Estimated mean concentration of these specimens = 0·056 un per ml.

Three doses of penicillin 0·5 mega-unit were given to 17 patients twelve, eight, and four hours before lumbar puncture. One of these had meningococcal meningitis; her C.S.F.-penicillin level was more than 2 units per ml. Of the remaining 16 patients 11 (69%) had penicillin in

ssisted in many ways. Messrs. Glaxo Ltd. supplied the n penicillin and standard solutions of penicillin.

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ERFORATED PEPTIC ULCER AFTER GASTRO-ENTEROSTOMY

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RFORATION of a peptic ulcer after operation for the of peptic ulcer is a rare occurrence of which I can nly one reported example. Courty and Gaudefroy [1] t a case of peptic ulcer occurring immediately gastrectomy and perforating eighteen days after peration. In the case reported here an existing loric gastric ulcer perforated six days after a o-enterostomy performed for pyloric stenosis.

woman, aged 65, a diabetic, had complained of a dull and a heavy feeling across the epigastrium for eighteen hs, with repeated attacks of vomiting of acid-tasting The vomiting relieved her, but alkalis had no effect e pain, which used to wake her up at night. She gave story of hæmatemesis, but had lost a good deal of weight. *examination* there was obvious loss of weight in her men. She was tender in the epigastrium and had marked gastric succussion. Barium-meal examination ed deformity of the duodenal cap with much delay ptying, the delay evidently being in the first part of duodenum. The radiologist suggested a neoplasm of all-bladder or pancreas. Test-meal showed high free total acidity. Hæmoglobin 82%, red cells 4,060,000 . mm. Colour-index 1·02. The fasting blood-sugar was g. per 100 ml. The diagnosis of pyloric stenosis was and operation was decided upon.

operation (March 14, 1949) through a right paramedian on a huge dilated stomach was found with pyloric sis due to chronic ulceration of the prepyloric region. osterior gastro-enterostomy was performed and the men closed.

stoperative Course.—After operation she had gastric on and intravenous 0·18% (a fifth of isotonic) saline he drip method until the third day when the bowel ds returned. She was sitting out of bed on the third and was making satisfactory progress until the sixth day operation, when she vomited 6 oz. of fluid "like peat r," and collapsed. She complained of no pain and ared to have acute cardiovascular failure. An intra-us drip was started again but she rapidly became semi-tose and pulseless. She had a pleural rub at the left , and had stertorous breathing. It was thought that might have had a pulmonary embolus and heparin was n into the drip. Sixteen hours after collapsing she died.

ecropsy Report.—The surgical wound was quite clean. gs congested. Heart normal in size. Myocardium pale friable. The peritoneal cavity contained a pint of thin n purulent fluid. The stomach was much distended. prepyloric ulcers about 1 cm. in diameter were present, one had perforated. The gastrojejunostomy was patent healthy. The rest of the intestine and the kidneys and reas were normal. The liver was pale, and the gall-der contained a few bilirubin calculi. The cause of death peritonitis from a perforated gastric ulcer.

y thanks are due to Dr. C. Giles for the necropsy rt.

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[1] Courty, L., Gaudefroy. *Mém. Acad. Chir.* 1946, 72, 208.

Reviews of Books

The Trend of Scottish Intelligence

The Scottish Council for Research in Education. London: University of London Press. 1949. Pp. xxviii+151. 7s. 6d.

IN the course of their inquiries the Royal Commission on Population were led to give special attention to the possible effects of the known differences in the birth-rate on the trend of national intelligence. The earliest school surveys, made in London as long ago as 1913, indicated a negative correlation between the size of the family and the amount of intelligence as assessed by psychological tests. On the other hand, a repetition of the tests at later periods failed to demonstrate any actual decline, at least of the order suggested by the correlation; and the general opinion of experienced teachers and education officials was that, so far as their memories would carry, the level of ability had remained pretty constant.

In view of this uncertainty, Sir Alexander Carr-Saunders, chairman of the Population Investigation Committee, suggested that one way of securing further evidence might be to repeat the psychological survey carried out by the Scottish research council in 1932. In that year a complete age-group, numbering something like 87,500 children, had been tested; and it was thought that if, as some had argued, the level of intelligence was falling rapidly, the effect should reveal itself after an interval of 15 years.

Accordingly a second survey was undertaken in 1947: and a preliminary account has now been published. The nine chapters of the report have been distributed among 8 contributors, and deal mainly with the details of the tests employed, the administrative arrangements needed for their application, the methods of marking, and a brief analysis of the more important results. As regards the main issue, we are told that, if the figures can be taken as they stand, then there was, during the short period in question, "not only no fall in the average score, but quite a substantial increase." Prof. G. H. Thomson, however, in his preface is inclined to attribute the change to increasing familiarity with psychological tests, and points out that, for this and other reasons, the figures obtained may quite possibly obscure an actual decline. Before any final conclusions are drawn, therefore, we must wait for the more detailed analysis of the data which the council promises, and possibly a third survey undertaken at a longer interval from the first. Meanwhile, the enterprise of the Scottish research council in organising so formidable a task may well encourage education authorities elsewhere to undertake similar school surveys: and the detailed account of the methods finally adopted will show how such schemes may best be planned and how the inevitable difficulties may be overcome.

Prognose und Therapie des Geisteskrankheiten

(2nd ed.) MAX MUELLER, M.D. Stuttgart: Thieme. 1949. Pp. 217. DM. 16.50.

Dr. Max Mueller surprised many who had read his book on psychiatric prognosis and therapy, in which psychotherapy was extolled, by becoming one of the most active proponents of insulin treatment after it had been introduced by Sakel. In the preface to this second edition of his book, he explains that the advent of such physical methods has obliged him to rewrite it throughout, without however attempting to deal more than cursorily with treatment by insulin, convulsions, or leucotomy: he has a separate detailed work on physical treatment ready for publication. Dr. Mueller still holds, however, that the psychopathological point of view is the essential one and that psychotherapy, with its concern for the whole man, cannot be ousted by a mechanical application of physical methods. His book represents the outlook of modern Swiss psychiatry, with the limits imposed on it by isolation during the war: thus in seven pages devoted to the treatment of general paralysis, all that is said of penicillin is in a sentence added to an account of the use of arsenicals, to the effect that "similar favourable results are reported of penicillin also." In the main, however, the book gives a valuable account of

Samples of fluid from three cerebral gliomatous cysts, which contained large amounts of protein, were assayed four to six hours after the injection of penicillin 0·5 mega-unit, when the serum-penicillin level would be about 0·4 unit per ml. These samples contained 8·0 units, 0·5, and 0·5 unit per ml.

That both penicillin and protein in amounts in excess of the normal may reach the C.S.F. by way of such damaged areas seems an obvious inference, for which, however, there is so far no direct proof.

Permeability and Age

The findings suggest that permeability may be increased in the elderly. The tendency is masked by the differences in pathology, but an attempt to allow for this factor to some extent has been made by excluding from the following comparison all those patients with a raised C.S.F.-protein level, including the neurosyphilitics and those who have received 20,000 units three-hourly. The figures in table VII have been changed to percentages for ease of comparison.

TABLE VII—SHOWING INCREASED C.S.F. CONCENTRATIONS IN THE ELDERLY

Age (yr.)	No. of cases	C.S.F.-penicillin level			
		0	+	++	+++
10–49	48	35%	48%	14%	2%
50 or more . .	17	12%	41%	41%	6%

Other Factors

No sex differences were detected, and no correlation between C.S.F.-penicillin level and pressure of C.S.F. The effect of malarial pyrexia on permeability is apparently slight.

The neurosyphilitic patients (cases 49 and 54) showed a decrease in permeability throughout the course of penicillin, presumably concomitant with a decrease in œdema or some other improvement in the function of the barrier membranes during therapy.

It has been previously shown by Boger et al. (1948) that caronamide raises the serum-penicillin and C.S.F.-penicillin-levels resulting from a given dose of penicillin. Cases 55 and 56 show the effect on C.S.F.-penicillin levels.

Optimum Dosage Schemes for Neurosyphilis

We have advanced evidence that penicillin permeates more readily tissue whose vascular structure is damaged. Probably the greater concentrations found in neurosyphilitics results at least in part from the penicillin permeating through the damaged membranes of small blood-vessels more readily than it would through normal tissue. It is known that the spirochætes are to be found in larger numbers alongside vessels and Virchow-Robin spaces in such damaged areas. This probably explains the efficiency of even rather small doses in the treatment of neurosyphilis. However, it is also probable that at all stages of neurosyphilis some spirochætes will be found in comparatively undamaged areas. To deal with these organisms, doses which penetrate normal tissue would be required. Now, if penicillin appears in the C.S.F., one cannot say that all nervous tissue is being reached. But, if penicillin does not appear in the C.S.F., one can say that not all nervous tissue is being reached. It is therefore reasonable, unless toxic symptoms appear, to use doses which would be sufficient to cause spirochæticidal concentrations of penicillin—at least 0·01 unit per ml. (Eagle and Musselman 1944)—to appear in the C.S.F. of almost all normal persons, not merely all patients with neurosyphilis. Our material, together with that of previous investigations, provides evidence on which to found a rational scheme of dosage. Schwemlein et al. (1946) gave doses of 10, 15, 20, and 25 mega-units by continuous intravenous drip over a period of twenty-four hours. The mean C.S.F.-penicillin levels reached with these doses were respectively about 0·03, 0·05, 0·04, 0·20 unit per ml. In the present investigation intramuscular doses of 0·5, 1, and 2 mega-units gave six hours later to C.S.F.-penicillin levels of 0·05, 0·[illegible] and 0·11 unit per ml. respectively. Comparison of [illegible] figures with those of Schwemlein et al. suggest intermittent dosage may be more effective than [illegible]ous intravenous infusion in breaching the C.S.F. [illegible] If this is so, the C.S.F.-penicillin level probably depends more on the height of the peak serum-penicillin level than on the time for which an effective serum-penicillin level is maintained. For example, to reach a relatively inaccessible tissue, in this case the C.S.F., a serum-penicillin level of 25 units per ml. maintained for an hour is as effective as one of 10 units per ml. maintained for several hours. Such a hypothesis would explain also our finding that repetition of the same dose does not greatly increase the C.S.F.-penicillin level.

Of 18 patients without demonstrable organic disease of the central nervous system who received 0·5 mega-unit of penicillin intramuscularly, 11 (63%) showed C.S.F.-penicillin levels higher than 0·037 unit per ml. Twice this dose, 1 mega-unit, would probably produce this level in almost all persons. Doses of 2 mega-units are well tolerated. In all our patients receiving 1 mega-unit or more, penicillin was found in the C.S.F. It thus seems that doses of 1 and 2 mega-units may justifiably be used, and are necessary to breach all normal barriers.

As regards the time-interval between doses, it seems improbable that the C.S.F.-penicillin level will fall as long as the blood-penicillin level is higher than it. When a dose of 0·5 mega-unit of penicillin is given, the blood-penicillin level is still 0·1–0·5 unit per ml. four hours later, justifying spacing of doses by at least this interval. If a limited amount of penicillin is to be used, large well-spaced doses are probably more effective in breaching the barrier than are small frequent doses.

SUMMARY AND CONCLUSIONS

The reliability of a serial-dilution method for the assay of penicillin in the C.S.F. was investigated.

The method was used to assay 152 samples of C.S.F. from 111 patients, who included a group of cases of parenchymatous neurosyphilis. The samples were obtained by ventricular, cisternal, and lumbar puncture, usually four hours after a dose of 0·5 mega-unit of penicillin.

A single intramuscular dose of 0·5 mega-unit produced a bactericidal C.S.F.-penicillin level in 70% of the patients.

After such doses penicillin appeared in the C.S.F. of persons with no demonstrable intracranial disease.

Penicillin was found in the C.S.F. of one patient fifty minutes after intramuscular injection. Four hours after injection penicillin is probably distributed fairly evenly throughout the C.S.F.

Those diseases which cause excess protein to appear in the C.S.F. also cause greater permeability of the blood-C.S.F. barrier to penicillin. High concentrations of penicillin were found in three cerebral gliomatous cysts. Thus penicillin apparently penetrates much more readily tissue whose vascular structure is damaged than it does normal tissue.

Barrier permeability tends to be higher in the elderly.

High or low C.S.F. pressure does not seem to affect permeability.

If a limited amount of penicillin is to be used, large well-spaced doses are probably more effective than small frequent doses for achieving high C.S.F.-penicillin levels.

We wish to thank Mr. Wylie McKissock for permission to use samples of C.S.F. from his neurosurgical patients at the Atkinson Morley Hospital; Prof. A. J. Lewis and Prof. S. Nevin, of the Maudsley Hospital, for much very kind help and advice; and all members of the staffs of the two hospitals

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the present state of prognosis and therapy of mental illness, leaning rather heavily but by no means exclusively on the German literature.

Brain and Behaviour

Induction as a Fundamental Mechanism of Neuro-psychic Activity. N. E. Ischlondsky, M.D. London: Henry Kimpton. 1949. Pp. 182. 21*s*.

In this monograph the author presents personal observations, mainly on vision and sensation, which serve to elaborate his views on the phenomena of "induction." Induction, in the sense of the monograph, covers the statement that "every manifestation of a nervous process leads, under certain well defined conditions, to the appearance of an opposite process." This conception is elaborated, from simple observations upon the visual responses to complementary colours, to those of group behaviour. Dr. Ischlondsky noticed in a mass experiment that when he propounded one point of view to an audience, 80% criticised his thesis; when he propounded the opposite point of view to another similar audience, 72% criticised *that* thesis. Though he contends that "there can hardly be a more convincing proof, or a more eloquent illustration, than this of the powerful effect of induction," other and equally eloquent interpretations will occur to the reader.

Dictionary of Genetics

R. L. Knight, D.Sc., Ph.D., senior economic geneticist, Empire Cotton Corporation and Sudan Government. Waltham, Mass.: Chronica Botanica Co. London: W. Dawson & Sons. 1948. Pp. 183. $4.50.

The terminology of genetics, with its "chiasmata," "heterotetraploids," "karyoplasm," "phenotypes," and "zygotene," not to mention "xerocleistogamy" and "merostathmokinesis," is forbidding even to the experienced pathologist. In his dictionary Dr. Knight makes a praiseworthy first attempt to ease the task of a relatively uninitiated reader of genetical literature. Some notes on statistics are provided in an appendix. Since Dr. Knight writes as a plant geneticist, the book shows botanical bias in defining medical terms like "thalamus" and "placenta"; for the human geneticist it may be used to amplify but not to replace existing medical glossaries.

Patologia Psicosomatica

Dr. J. Rof Carballo. Madrid: Editorial Paz Montalvo. 1949. Pp. 818. Ptas 200.

In this large volume Dr. Rof Carballo reviews the extensive literature dealing with the response of bodily structures to emotional changes. The first twelve chapters are concerned with a general appraisal of psychiatric theories against the background of structure, while the remaining major part deals with the responses of individual systems of the body. This section of necessity deals with such a wide field of medicine that it can be used to support the contention that the adjective "psychosomatic" indicates an approach to, rather than a division of, the subject. The author has supported his thesis with a large and well-balanced bibliography as well as by many personal observations. It is a fine reference work, but the fact that it is in Spanish will limit its use.

Photo-electric Methods in Clinical Biochemistry

G. E. Delory, M.Sc., Ph.D., assistant professor of biochemistry, University of Manitoba, Winnipeg. London: Hilger & Watts. 1949. Pp. 90. 15*s*.

This small handbook gives briefly the theory on which photo-electric methods are based, detailed instructions for the use of the two photo-electric colorimeters manufactured by Messrs. Hilger, and accounts of several estimations in clinical biochemistry with techniques based mainly on those developed in Prof. E. J. King's department at the Postgraduate Medical School of London. Photo-electric methods are becoming more popular, and this handbook will therefore be welcomed. It is unfortunate that the instructions are applicable to the instruments of only one firm, but there will be little difficulty in adapting the methods to whatever type the reader has in use.

Occupational Therapy Source Book

Editor: Sidney Licht, M.D. Baltimore: Williams
Wilkins. London: Baillière, Tindall, and Cox. 19
Pp. 90. 5*s*. 6*d*.

The use of occupation in the treatment of the ins
has been strongly advocated by some of the f
writers on psychiatry since the end of the 18th centur
There are here extracts from the Frenchmen Pi
Esquirol, Leuret, and Voisin; from the America
Benjamin Rush, Kirkbride, and Eva Reid: from Ke
and from William Halloran of Cork and Samuel Tu
of the York Retreat. The editor contributes a bri
account of the early history of occupational therap
The defect of this collection lies in its failure to make
reference to Hermann Simon of Gütersloh, who
influence on the practice of occupational therapy i
European mental hospitals has been very great, thoug
perhaps not wholly beneficial.

Neurology

(4th ed.) Roy R. Grinker, M.D., director of the institu
for psychosomatic and psychiatric research and trainin
Michael Rees Hospital, Chicago; Paul C. Bucy, M.D
professor of neurology and neurological surgery, Unive
sity of Illinois. Oxford: Blackwell Scientific Publication
1949. Pp. 1138. 63*s*.

This is now a standard textbook of neurology, thou
its size and the detail of its descriptions make it unsu
able for the junior student. This edition differs from i
forerunners both in subject matter and format. It h
been reset and extensively revised, and in both respec
improved. Clinical neurology is now such a vast an
rapidly changing subject that advanced textbooks a
apt to be cumbersome. Dr. Grinker and Professor Buc
aware of this danger, have pruned as they have add
new material. One of them has a psychiatric and t
other a surgical approach, and it may be this combinati
that gives the book its breadth of interest. Function
not submerged in structure, though some of the
ical aspects of neurology receive more attention th
disorders of function. The book is more suited to
neurological surgeon than the neurological physician
but the best neurological surgeons emerge throu
physiology and medicine, and the most enlighten
neurological physicians have had experience of t
surgical method. Many will use this as a referen
volume, and it will also be popular among senior student

Recent Advances in Oto-laryngology (2nd e
London: J. & A. Churchill. 1949. Pp. 395. 24*s*.).—Th
delightfully readable book has been extensively revised a
new chapters introduced. Some unevenness is noticeabl
particularly in the theoretical sections, possibly owing t
Mr. R. Scott Stevenson's anxiety not to omit any reasonab
contribution to a given problem. There hardly seems muc
place in this sort of book, for example, for a detailed a
illustrated account of a technique of tonsillectomy. The bu
of the more modern references are English and North America
The advanced student will find a *great deal* to interest a
instruct him and the practising specialist will derive muc
profit and stimulation in reading the discussion of any proble
in which he is particularly interested—so well covered is eve
phase of the specialty.

Training for Childbirth (4th ed. London: J. &
Churchill. 1949. Pp. 192. 10*s*. 6*d*.).—Nowadays, wh
so many people are talking about analgesia in childbirth,
is particularly interesting to read the fourth edition of Mi
Minnie Randell's excellent exposition of the advantages o
unsedated delivery. She writes as a physiotherapist an
a nurse, and shows how the mother, through education an
training, can enjoy the birth of her child without sedative
The book is written for mothers, and includes good chapte
on anatomy and physiology and on the preparation fo
breast-feeding. Miss Randell's diaries might benefit fro
editing; they would then show more clearly how a knowled
of the bodily processes in delivery help the mother so greatl
and would lose the somewhat macabre flavour they have a
present. The illustrations are good and clear, and the exercis
given are related wherever possible to ordinary househol
duties. It is a book to be read by all who are interested i
childbirth, including members of *Parliament*.

THE LANCET

LONDON: SATURDAY, OCT. 8, 1949

Misadventure in Prophylaxis

ATH from disease is natural, and, sooner or later, expected. But death arising through medical s to prevent disease is unnatural and on the of it unnecessary. Fatality has no place in ntive medicine and comes as an unforeseen dy. A painful example is the death "by lventure" of three Hornsey children who oped acute hepatitis some eight weeks after lation with human serum to prevent measles. St. Pancras coroner, after searching questions, rated the doctors, the technique, and the ges, and attributed the fatal hepatitis to the nce of a virus in the serum used.[1]

e lessons that may be learnt from this disaster arious. The facts are that since 1941 the Medical rch Council has issued whole adult serum in of 5–10 ml. for measles prophylaxis or attenua- 30,000 healthy children, contacts of measles at nurseries, have with their parents' consent injected with such doses intramuscularly: and 1946 a planned investigation has been in progress ie comparative preventive value of a British ia-globulin and of pooled serum. Until last h no cases of jaundice were observed among f these inoculated children. Actuarily, therefore, isk of such prophylaxis has proved extremely , while the advantage gained, though less easily uted, may have been very substantial. In 1947 gland and Wales 576 children under five years of ied of measles or its immediate complications: young children the disease is still one that is worth preventing or modifying. Up till now, ast, most doctors would have been prepared ke the associated risk if their own children were ed to the dangers of measles in a community as a nursery school. But does this imply that its should be urged to permit their healthy en to be inoculated? So long as there is some ble risk to the normal person's health in accepting ylactic measures, this risk ought to be explained. whereas it is easy to adopt an authoritarian ide ("the doctor knows best") it may often be ult to make the position reasonably clear to its without frightening them into refusing the its.

e hazards are those inherent in the injection of in blood products. The past ten years have all too many reports of jaundice, sometimes fatal, developing 50–180 days after injection of convalescent serum, of yellow-fever vaccine suspended in human serum, and of whole blood, plasma, or serum, or after intravenous injection of drugs with syringes contaminated internally by traces of blood from other patients. This "homologous serum jaundice" is attributed to the presence of a living virus in the donor's blood, and though the proportion of donors harbouring the virus may be no more than 0·35%[2] the danger is magnified when individual donations are pooled, as in preparing plasma and serum. Unfortunately there is as yet no practical means by which blood can be routinely tested for the presence of virus: but efforts have of course been made to minimise its spread. Thus at regional transfusion centres steps have been taken to lower the risk that arises from pooling: the maximum number of donors whose plasma or serum is mixed is limited to ten. Further the centres will not accept blood from a donor who gives a history of jaundice within the previous twelve months—a time limit imposed on experimental evidence that blood from recovered cases of serum jaundice did not infect human volunteers more than two months after the end of the illness. The batch of blood used to prepare the serum which infected the Hornsey children was prepared from a group of 60 donors of whom it is now known that 5 had suffered from jaundice at periods varying from five to fourteen years before being bled. This not only illustrates the extension of risk by having a large pool but also suggests the need to revise the rule permitting acceptance of blood from donors only one year after suffering from jaundice. (We wonder incidentally how many of the hundreds of thousands of donors bled annually have been, or are, asked specifically whether and when they have had this disease.) On the other hand in LEHANE's survey[2] follow-up of donors contributing to icterogenic plasma pools revealed only one who had had jaundice—and that was three months after being bled. The donor with a subclinical attack or incubating the disease may well be the more serious menace, and at present there is no way of detecting such people. All this being so, any doctor who uses a blood product must know exactly what he is giving and be aware of the dangers. Bottles of plasma, for therapeutic use, already bear a warning that the risk of hepatitis following its infusion is "up to 10%,"[3] and this must be a very considerable deterrent to its use where life can be saved by any less dangerous means.

What other precautions are open to us? American work suggests that hepatitis virus in a blood product can be inactivated by exposure to ultraviolet light, and this may make it possible to provide a safe plasma. From the standpoint of prophylaxis it is more important to know that gamma-globulin prepared from serum by fractionation is believed to be always free from virus. If experience confirms this, the fractionated product must as quickly as possible supersede whole serum; and we hope that it will soon be generally obtainable in this country, though it must be remembered that still more donors will be needed to provide it.

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[1] *Lancet*, Oct. 1, p. 630.

[2] Lehane, D., Kwantes, C. M. S., Upward, M. G., Thomson, D. R. *Brit. med. J.* Sept. 10, p. 572.

[3] Gibberd, G. F. *Lancet*, 1949, i, 369.

Left Ventricular Failure . . .

In manifestations of left ventricular failure the action of Cardophylin may be of great value. This action is probably two-fold, consisting of an increased blood supply to the failing myocardium as a result of coronary vasodilatation and a direct stimulating effect on respiration.

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nt issue two more strange instances of poisoning ad are described: **Kennedy** and **Lynas** report case of a woman of 46 who had generalised iative dermatitis, treated with lead-acetate ings. It was estimated that about 1400 mg. organic lead had been in contact with the skin ixteen weeks, though the dressings had actually applied intermittently over a period of seven hs. At the end of this time she developed mild intoxication which responded to treatment with onium chloride, parathyroid extract, and a alcium diet. It is assumed that lead acetate absorbed through the damaged skin. The rs refer to the animal experiments of **Laug** and ze,[1] who showed that the volatile organic lead pounds—e.g., tetra-ethyl lead—easily penetrated skin of rats, whereas the inorganic compounds through only in very small quantities. **Kennedy** **Lynas** do not mention that when wide areas of are smeared with lead compounds the fingers food may become contaminated, though clearly must be taken into account when tracing the by which the lead entered the body. Their le, however, will draw attention to the harm h may result from the protracted contact of lead pounds with a damaged skin.

more serious source of lead poisoning is discussed ordon and **Whitehead**. They report a case of encephalopathy associated with rickets in a onths-old infant whose mother had used lead le-shields during lactation. The infant had been itted to hospital with a provisional diagnosis of rculous meningitis. The main signs of chronic poisoning in infants are fretfulness, irritability, lessness, convulsions, vomiting, a tense fontanelle, opisthotonos; there may also be ocular changes as papillœdema, optic atrophy, and optic itis. The blood may show anæmia, punctate philia, and reticulocytosis, and the cerebro- al fluid is under increased pressure. Radio- hy of the long bones usually reveals a dense line nd on the epiphyses due to the deposit of lead salts ese areas. The first case of this sort recorded seems ave been that of **Cadman**,[2] who in 1902 described finite example in a boy aged 5 weeks. Here the her's milk had clearly dissolved some of the lead ld. In the U.S.A. similar accidents were reported 926 and 1939.[3] **Gordon** and **Whitehead** point that the infant might have absorbed lead by of three means: (1) ingestion of metallic lead a deposit on the mother's nipple; (2) ingestion deposit of lead salts on the nipple; and (3) rption of lead from the mucosa of the nipple excretion in the breast-milk. Whatever the te of absorption, lead nipple-shields are manifestly gerous and their use should be abandoned. In tter on another page Dr. **Helen Mackay** and **Donald Hunter** appeal to doctors and midwives lo all they can to abolish the use of this dangerous al in nipple-shields for nursing mothers. "No ther," they say, "would risk using them if she w the facts." The Ministry of Health in a ular letter, dated Sept. 7, also emphasises the ent importance of discouraging the use of lead nipple-shields; and notices are being sent to all doctors, chemists, and suppliers of surgical appliances.

The prognosis of lead poisoning in infants is bad. **Byers** and **Lord** [4] have shown that lead poisoning in childhood has a severe deleterious effect on mental development. Of 20 school-children who had recovered from lead poisoning, only 1 made satisfactory progress at school; all the others had behaviour difficulties, with loss of normal inhibition, and were unreliable, cruel, and impulsive. **Alice Hamilton** [5] quotes the work of **Riggs** and others, who found a significantly higher concentration of lead in the kidney and the pituitary in 95 patients where death was not adequately explained by clinical or necropsy findings, compared with 40 where the cause of death was clearly defined. In the first group there have been signs and symptoms suggesting that lead encephalopathy was the cause of these unexplained deaths. Again, the work of **Nye**,[6] in Queensland, showing that lead poisoning in childhood leads to a high incidence of chronic nephritis in later life, should be borne in mind. The sources of lead poisoning are numerous and the long-term effects disastrous, particularly from intoxication in childhood. One source of poisoning can instantly be eliminated by abolishing lead nipple-shields.

Annotations

PUBLICITY AS A PENALTY

Only last week we commented [7] on a letter from the Ministry of Health warning executive councils of the care they should take in giving publicity to disciplinary proceedings. The Minister's view was that "at no stage should mention be made of the names of the parties to the proceedings or of other particulars which might lead to their identification." Hence it was surprising to find the Ministry itself a few days later issuing simultaneously to the medical and to the lay press an account of the proceedings and findings of the first tribunal to be convened to hear a case against a medical man and including in that account the full name of the medical man against whom the proceedings had been taken. The inclusion of his name seems all the more unfortunate in view of the tribunal's decision that "all those facts which it has found to be established amount to a single incident, and the tribunal has come to the conclusion that, despite the very grave and serious view which it takes of the matter, it is not justified in saying that this single incident is such as to cause the continued inclusion of the respondent in the said medical list to be prejudicial to the efficiency of the General Medical Services." The doctor is to be allowed to continue in his practice, but that practice must now be gravely damaged by the harmful publicity given to his offence by the lay press last week.

Was this publicity necessary? Would not a record of the case without names have sufficed to show both layman and doctor that justice had been done? Full details of the case, preserving anonymity, had been published earlier in the year after the hearing by the medical services committee. Last week's report added only the reasoned findings of the tribunal, and the doctor's name. None will deny the need to give publicity to the tribunal's attitude to the case, but the regulations [8] leave the Minister free to publish any decision of the

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aug, E. P., Kunze, F. M. *J. industr. Hyg. Toxicol.* 1948, 30, 256.
adman, H. C. *Lancet*, 1902, ii, 1458.
bid, 1939, i, 462.

[4] Byers, R. K., Lord, E. E. *Amer. J. Dis. Child.* 1943, 66, 471.
[5] Hamilton, A., Johnstone, R. Industrial Toxicology. New York, 1945; p. 610.
[6] Nye, L. J. J. *Med. J. Aus.* 1929, ii, 144.
[7] Annotation, Oct. 1, p. 616.
[8] Statutory Instruments. 1948, no. 507, sect. 43.

Aerosols by Inhalation

FROM its humble rôle in the palliation of asthma, aerosol inhalation has evolved into a means of administering antibiotics and other chemotherapeutic substances. Quantitative work during the late war[1] was followed by clinical trials at home and abroad; and now certain special indications and limitations are recognised.

The aerosol offers attractive opportunities for laving the respiratory mucosa with drug solutions at concentrations which are not merely bacteriostatic but germicidal; for example, a neutral solution of 10% sulphathiazole (in the form of 22·5% 'Soluthiazole') containing 50,000 units of sodium penicillin G per ml.[2] should normally suffice to destroy a wide range of infective organisms. Moreover, by this method vulnerable compounds enter the body through the lungs without exposure to destruction by the digestive juices; and the drugs do not disturb the natural balance of the intestinal flora—a matter of some importance since nicotinic-acid deficiency may result from inhibition of colonic bacteria by antibiotics administered by mouth.

It is now known that a portion of the inhaled drug is absorbed quickly and exerts a systemic action, while an appreciable fraction remains trapped for many hours in the sputum and pulmonary discharges, where it continues to produce its specific effects. This partition probably accounts to some extent for the wide individual differences of drug concentrations in the blood and urine during any given inhalation routine. The aerosol method is especially applicable to the treatment of diseases of the bronchial tree, where direct access permits of intensive topical therapy. WILSON and his co-workers[3] have shown that in experimental pneumonia penicillin is just as effective, dose for dose, when inhaled as it is when given by injection, even though the final airways are blocked so that the drug can reach the infected zone only after absorption into the blood-stream. Thus bronchopneumonia, especially in young children, can hopefully be added to the selected list.

Comparison of results is difficult, for aerosols are of various types and are somewhat unstable, and the techniques and devices for administration are many. It is hardly surprising that the status of inhalation therapy has still to be defined. GÖSTA ROOTH's[4] recent quantitative survey is, however, particularly welcome. He has carefully explored the quantitative aspects of mist production and preservation and of bronchial penetration and deposition, by physical and chemical measurements of the mists themselves and by analyses of the urine, blood, and sputum of his patients. There can be little doubt that for administering chemotherapeutic substances in pulmonary diseases, nebulisation by hand-bulb is totally inadequate. Not only must the aerosol be of a particle size suitable for ingress to the desired depth, but the weight of drug carried by these small particles must be as great as possible because even the densest mists are weak compared with simple solutions. The length of each inhalation session, which is also of practical moment, depends on the volume of mist taken in with each breath. An upper limit is set by the pulmonary ventilation-rate of 6–10 litres per minute, and to avoid the tedium of lengthy administration this should form the lower limit of production by the machine. There seem, moreover, to be some slips 'twixt cup and lip. The amount of solution leaving the nebulising phial is by no means the same as the amount actually passing into the trachea. Unless the conduits and the face-piece or nose piece are streamlined and the expired air is prevented from buffeting against the oncoming mist, the droplets coalesce into drops and deposit in the external airways on the face, or in the anterior part of the nasal passages. The interposition of a humid space between the delivery-tube and the patient—as when the mist is puffed into an oxygen tent—causes a rapid increase in the diameter of the droplets and so promotes deposition. The same unfortunate loss takes place when ice is used to extract excess moisture from an oxygen tent. Water-vapour and aerosol precipitate at the dew-point.

Considerable technical knowledge is needed by all who would practise the method successfully, and much still remains to be done by the instrument makers. Jets are readily blocked by even the finest floating particles; the need is for a simple apparatus with an accessible nebulising device which can be quickly cleaned and which will produce denser mist at full ventilation-rates delivered to the patient without loss. It should then be possible to abort the annual attack of recurrent bronchitis, to control the acute phases of bronchiectatic inflammation, to increase the safety of operations on infected lungs,[5] and to eliminate the secondary septic complications of influenza and other pulmonary virus diseases.

Dangers of Lead

THE history of man's use of lead has a respectable antiquity, for the containers for the plants in the hanging gardens of Babylon were of lead, and it is mentioned by HIPPOCRATES as a cause of poisoning. It also has an uncomfortable modernity, since it still poisons people in strange and unsuspected ways. In industry lead and its salts have many uses, but the risk is recognised; poisoning is now rare, and when it does arise it is much less severe than fifty years ago. At the beginning of this century there were over 1000 industrial cases yearly; now the number rarely reaches double figures. It is from the non-industrial uses of lead that bizarre cases of poisoning crop up from time to time. The actor, for instance, may be poisoned by grease-paint containing lead; a bullet in the lung may set up slow poisoning; curry powder has occasionally contained lead chromate and caused abdominal pains in those who consumed it; the "poisoned rain drops" on the white verandahs of Queensland houses produced many cases of lead poisoning and nephritis in children; the lead pipes through which the cider and beer is drawn from cellar to bar have caused Saturday-night colic; the peat acids in a town's water-supply can dissolve lead salts from the pipes through which it passes and poison large numbers of people; and so on. In the nd that would involve the addition to the central of many more millions of pounds even than the ained, and perhaps unattainable, sum already . by the General Medical Services Committee. It ses that executive councils should be empowered vance money for the purchase of cars, equipment, remises to enable young doctors to start practice eas where they are needed, recovering this money egular deductions from the quarterly cheques. unhappy about the varying conditions under the fixed annual payment is made in different , and suggests that the Medical Practices Committee d determine and make these grants, drawing the sary monies from the central pool or from a separate It would like to see a limit placed on the time g which a principal can continue to enjoy the its of employing an assistant, and it believes that having had an assistant for two years he should r admit a partner or reduce his list—though rently this rule would be waived where an assistant ployed, not to help cope with an inflated list, but r because the principal is infirm or old.

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[1] Mutch, N. *Lancet*, 1944, ii, 775.

[2] Mutch, N. *Ann. rheumat. Dis.* 1949, 8, 105.

[3] Wilson, C. E., Hammond, C. W., Byrne, A. F., Bliss, E. A. *Bull. Johns Hopk. Hosp.* 1945, 77, 411.

[4] Rooth, G. *Acta med. scand.* 1949, 133, suppl. 228.

[5] Holborow, E. J., Spriggs, E. A. *Lancet*, 1948, ii, 6
Annotation, *Ibid*, p. 938.

ese are but a few of the suggestions thrown out in mphlet full of material for thought and debate. of the recommendations made are already being led; some are not yet practicable: and some may r be practicable. But in posing the problems and esting possible means of resolving them the Medical titioners Union has done a service.

INFLAMMATORY STASIS

1931 Kreyberg and Rotnes[1] demonstrated stasis in ear vessels of the rabbit following the trauma pro- d by freezing. First lithium carmine was used to ur the blood-plasma; then a stick of carbon-dioxide was applied to the ear in several places. In a few tes the traumatised regions were pinker than the of the ear—an appearance due chiefly to filling of dilated vessels with flowing blood. Twenty-four s later indian ink was injected into the heart, and it the entire vascular system except these pink matised regions, in which the blood-vessels were dilated but the blood was in stasis. This stasis is due to thrombosis but to the solid packing or con- ination of the red blood-cells. These long columns onglutinated red cells cannot readily be moved along vessels in which they lie, so that anoxæmia and ndary necrosis may develop in their field of supply.[2] se changes, so clearly demonstrated in relation to zing, play their part in inflammatory reactions to r noxious agents; and much of the tissue damage in mmatory foci may result from anoxia secondary tasis.

rofessor Kreyberg's letter in this issue draws attention ur lack of knowledge of the pathogenesis, prevention, treatment of prestasis and stasis. The commonly view of the pathogenesis of stasis is that plasma s through damaged capillary walls, leaving the vessels d up with blood corpuscles. However, Lewis[3] found t after histamine damage to capillary walls, fluid ely resembling plasma leaks out of the capillaries; yet stasis does not ensue. It appears therefore that plasma leakage is not the only factor concerned in production of stasis. During the second world war problem arose of treating people whose extremities been severely chilled but not frost-bitten. Removal m the cold environment was often followed by patho- ical changes in their feet or hands, including even grene. Probably vascular stasis plays a considerable rt in the development of this syndrome, which came to be known as immersion foot[4]; and with greater knowledge of the prevention and reversal of stasis more effective treatment might have been devised.

UNKNOWN QUANTITIES IN JUVENILE DELINQUENCY

EVERYBODY feels competent to give advice about a bad child. In March of this year, the Home Office and the Ministry of Education jointly set out[5] the best available opinion on possible remedies for juvenile delinquency. The provisional figures for 1948, they said, showed an increase of 26% for children under fourteen, and of 23% for children between fourteen and seventeen, found guilty in magistrates' courts of indictable offences. The remedies suggested—which included secure affection, a stable environment, better opportunities for leisure occupations, proper training and guidance, special education for the handicapped, and guidance for those starting work—have wide support among knowledgeable people, and may well be the right ones, even if they are not particularly easy to achieve. But at a conference[6] on Oct. 1, on the scientific study of juvenile delinquency, many speakers pointed out that we really have very little scientific evidence to go on.

A broken home is a common finding in the history of delinquents; yet under this heading, Dr. Hermann Mannheim remarked, we lump together many different situations: the break may be due to death, or to desertion. In the same way a "gang" may be a band of boys collaborating in an isolated offence, or a semipermanent association of unruly young people. Boys who belong to clubs are less often in trouble than those who do not; but it may be that clubs attract boys who would not in any case get into trouble. Again a "club" may be a good influence or a poor surrogate for the real thing. Opinion about the influence of films fluctuates between the old theory of "imitation" and the newer theory of "healthy outlet." Prof. T. S. Simey quoted the view of the late Dr. Kurt Lewin, that "it is usually easier to change individuals formed into a group than to change any one of them separately," and suggested that a better social setting for family life might itself reduce delinquency. At present, as several speakers noted, our information is confined to the study of delinquents brought into court; we have no means of comparing them with their fellow citizens, or deciding to what extent the rest of us show delinquent tendencies. But even what evidence we have is not widely accepted, even in magistrates' courts. We know, for example, that first offenders are best dealt with by methods other than imprisonment; yet the report of the Prison Commissioners,[7] for 1948, deplores that, in 1947, 712 youths and 88 girls were sent to prison for their first proved offences. In fact, "evidence," as Mr. Alec Rodger said, "is not necessarily acceptable because it is indisputable and cogently presented. Professor Simey remarked that we are all afraid of the latent delinquent in ourselves. There are therefore good grounds for Dr. Denis Carroll's plea that all those concerned with the disposal and treatment of delinquent children should read up their subject.

The general feeling of the conference, later embodied in a resolution, was that research on a large scale should be initiated in consultation with all the professions concerned. Dr. Carroll put the case for setting up a Delinquency Research Council, or a council with an even wider scope to cover social research in general.

Kreyberg, L., Rotnes, P. *C.R. Soc. Biol. Paris*, 1931, 106, 895. Rotnes, P., Kreyberg, L. *Acta path. microbiol. scand.* 1932, suppl. 11, p. 162.

Kreyberg, L. Development of Acute Tissue Damage Due to Cold. *Avh. norske VidenskAkad.* 1948, no. 5.

Lewis, T. Blood Vessels of the Human Skin and their Responses. London, 1927.

[4] Ungley, C. C. Immersion Foot Syndrome. Advances in Surgery. London, 1949; vol. 2, p. 269.

[5] Memorandum on Juvenile Delinquency. London. H. M. Stationery Office. Pp. 7. 2*d*.

[6] Convened by the British Psychological Society, the Howard League for Penal Reform, the Institute for the Scientific Treatment of Delinquency, the Institute of Sociology, the National Association for Mental Health, and the Royal Medico-Psychological Association. See *Lancet*, Sept. 17, p. 541.

[7] Report of the Commissioners of Prisons and Directors of Convict Prisons for the year 1948. H.M. Stationery Office. Pp. 124. 2*s*. 6*d*.

tribunal "in such manner as he thinks fit." The question therefore arises whether the abandonment of anonymity was deliberate, and, if so, whether this decision was taken because it was felt that the doctor's culpability was too great justly to allow of his escaping scot-free. A penalty of unpredictable severity has in fact been imposed on him, and this is a bad precedent to come out of the first case to be tried by the tribunal. Lest it should become sanctified by recurrent use it might now be well if the regulations could be looked at again, and means found whereby the tribunal or the medical services committee could be empowered to impose one of the lesser penalties prescribed in the regulations[9] on an offender whose offence, though regarded as culpable, is not eventually deemed sufficient to warrant the removal of his name from the medical list.

COMPOSITION OF GASTRIC JUICE

Of late there has been much progress towards a clearer understanding of the bewildering variations in the composition of gastric juice; and a review by Franklin Hollander[10] should encourage the clinical application of this work.

Advances have been brought about by means of improved chemical methods and the statistical analysis of results. Chemical studies of the organic material in the gastric juice have made the subject more complex; for example, the proteolytic activity of the gastric juice must now be regarded as probably due to a mixture of enzymes, and Glass and Boyd[11] have divided the gastric mucus into two chemically distinct fractions. On the other hand, the statistical analyses which stem from Hollander's pioneer work have made it possible to predict with some certainty the relations between the concentrations of the main inorganic constituents. In man and in animals the composition of pure gastric juice varies widely. It may be acid, with a pH as low as 0·9, or it may be as alkaline as the blood, with a pH of 7·4; and the concentration of chloride may lie between 120 and 170 milli-equivalents per litre. The main bulk of the inorganic constituents apparently originates in two components of fixed composition—a secretion containing a concentration of about 170 milli-equivalents of hydrochloric acid per litre, and an alkaline secretion. When the rate of secretion of the gastric juice rises, the increase is mainly in the acid component; thus when the rate of secretion is high, the proportion of the alkaline component is small so that the concentration of acid in the gastric juice is nearly as great as the concentration in the pure acid component. The alkaline component contains less chloride than the acid component, and so a fall in the proportion of acid component is accompanied by a corresponding fall in the concentration of chloride in the mixture. In a neutral gastric juice, the acid component being neutralised by the alkaline component, the concentration of chloride is about 120 milli-equivalents per litre; this chloride is known as "neutral chloride" since it is in electrical equilibrium with alkali metals. At the other extreme, when the gastric juice is very acid most of the chloride is in electrical equilibrium with hydrogen ions and the concentration of neutral chloride is as low as 3–5 milli-equivalents per litre.

Hollander obtained confirmation of the two-component hypothesis by plotting the concentration of acid in the gastric juice of dogs against the corresponding concentration of neutral chloride; the points fell on a straight line. By extrapolation of the straight line he found the expected concentration of acid in the gastric juice when the concentration of neutral chloride was zero. This was about 170 milli-equivalents of hydrogen ion per litre, which he assumes to be the "primary acidity" of the parietal component. Hollander and his workers[12] have also been investigating the alkal component. The cells producing this component, wh are not confined to the pyloric portion of the mucos are specifically stimulated by the local application eugenol (*B.P.C.*).

It appears that the membrane of the parietal cell permeable only to water, hydrogen ions, and hal ions. The hydrochloric acid is thus secreted as at a concentration which is slightly hyperosmotic the blood. Recent studies have shown that the metabolism of the parietal cells is not sufficient to the hydrogen ions excreted, which are withdrawn the form of bicarbonate from the blood flowing th the gastric mucosa.[13] These investigations may reveal some specific inhibitor of acid pro therapeutic tool which would be welcome in the treatment of peptic ulceration. Hitherto most clinical investigations have been concerned with the concentration of acid and to a less extent pepsin, in the gastric contents. The distinction between resting juice, a mixture duodenal contents, saliva, and gastric secretion, digestive gastric contents in which the gastric juice is mixed with food, and pure gastric secretion has not impressed itself on all clinical workers. The day is not far distant, however, when the gastric secretory response will have to considered in terms of the separate contributions from the various types of cell in the gastric mucosa.

ENTRY INTO PRACTICE

THE Medical Practitioners' Union has circulated to the profession a pamphlet which, though chiefly concerned with the difficulties encountered by entrants into general practice, also touches on some of those facing the would-be consultant.

Contrasting the material prospects of general and specialist practice, it shows that even if the general practitioner achieves a maximum list of 4000 patients—a number which the M.P.U. regards as much too large—his net income will still fall short of that of the least of his contemporaries who has achieved consultant status. Few general practitioners, however, are likely to acquire as many as 4000 patients even in the underdoctored areas; for the existing large practices are preserved by the automatic transfer of each deceased or retiring doctor's list to a single nominee—often a partner or assistant. The M.P.U. suggests that, instead of continuing this custom, the executive councils should be required to break up practices so that only a portion (varying from a quarter to a third) is automatically transferred to the doctor nominally taking over the practice, the remainder being divided by the allocation committee among neighbouring doctors with small lists, and—where extra doctors are needed—among invited newcomers. This, it thinks, might do much to help and encourage men who are now struggling, and might also allow of the easier introduction of new doctors into underdoctored areas. Despite these merits, however, the suggestion will meet with opposition, for it runs counter to the policy so far observed by the Medical Practices Committee, who deem it their duty as far as possible to preserve the identity of existing practices, and who agree only in special circumstances to the dispersal of existing lists among several doctors. Moreover, executive councils and local medical committees—which are jointly responsible for providing the allocation committees—are chary of using their powers of allocation, and much prefer that patients shall be given, and shall make, their own choice of doctor.

The M.P.U. favours a sliding capitation fee, and still, we find, adheres to its opinion that the proper fee should be 30*s*. for the first 2000 patients and 20*s*. thereafter—a

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9. *Ibid.* Sect. 6 (*a*), (*b*), (*c*).
10. Hollander, F. *Science*, 1949, 110, 57.
11. Glass, G. B. J., Boyd, L. J. *Gastroenterol.* 1941, 12, 821.
12. Hollander, F., Lauber, F. U., Stein, J. J. *Amer. J. Physiol.* 1948, 152, 645.
13. Davies, R. E., Edelman, J. *Biochem. J.* 1948, 43, 57.

Special Articles

THE STUDENT'S OBJECTIVE *

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r the beginning of an academic year, most of us, ils and teachers alike, are inclined to do a little ate stock-taking—to ask ourselves what we are ing at and whether we are going the right way ut it. I will try to help you in this process. My le qualification for doing so is that I have spent ctically the whole of the last 35 years working among ients in three continents, and during that time I e had the good fortune to know as teachers and eagues some very great men.

)ur medical world is in a state of rapid change. the one hand we have the National Health Service, ch is faced with the stupendous task of providing only doctors *and* nurses but also sufficient hospital s and good equipment to meet the needs of the ion's sick. On the other hand we have the changes ught by medical research and discoveries in the ic sciences, and these changes have become more nerous and more important in the last 30 years n they used to be. Think only of the effect of the overy of insulin and penicillin, and of the modern atment of anæmia. And that is not all, for looming ad are substances which will be effective in treatment of the various types of rheumatism and cer. You might suppose from this conjunction of nges and from what has been said about social licine and health centres that most doctors of the ire will spend their time in preventing disease, in ping people well. I do not think that things will n out that way. So far from reducing the hospital ulation these life-saving discoveries seem to increase need for yet more hospital beds. Beds are required, n for long periods, to treat patients who would have d but for the new remedies. And more often than these patients survive to get ill again on some future asion. Undoubtedly there is a big field to be developed prevention of disease and ill health, but for most of the main task of the future will be, as it has been in past, the care of sick people. And our main objective o become good doctors.

THE GOOD DOCTOR

Iow does one become a good doctor? When one tor says of another, "He is a good doctor," the rds have a particular meaning. You will hear the ression used not only about some general practitioners, also about some specialists. As I understand it ood doctor is one who is shrewd in diagnosis and e in treatment; but, more than that, he is a person o never spares himself in the interests of his patients; l in addition he is a man who studies the patient not y as a case but also as an individual.

)iagnosis and treatment are of course the basis of our rk with patients. We learn these subjects day in l day out as we walk the hospitals, and we have to s examinations in them. I do not propose to discuss m except to emphasise that after graduation none of is infallible; if we accept this fact, and are prepared go on learning, our mistakes will become less frequent d less serious.

How does one learn to devote oneself unsparingly to e's patients? You cannot get this from books or from formal clinical instruction. It is something which is passed on from one generation of doctors to the next, and the easiest way to acquire it is to work with a doctor who already has it in his blood. Lister, for example, was a good doctor: he used to visit his patients in King's every day, including Sundays, and his eminence and his preoccupation with research did not prevent him from showing great understanding and consideration of their feelings.

Your patients need from you more than diagnostic and therapeutic efficiency They do not come to you to be cured; they come to be relieved of their pains and other symptoms and to be comforted. Forced to choose, they would usually prefer a kind doctor to an efficient one. Never forget that the patient and his relations are usually frightened and anxious—upset in their normal life to such an extent that they are prepared to call *you* into their lives and to tell you the most intimate facts about themselves, though you may be unknown to them except as a member of an honourable profession. In their anxiety, especially when things are not going well for them, they may on rare occasions be rude to you and offend your dignity. This may be hard to bear, especially in the early days of one's medical life before one has lost one's self-consciousness at the bedside and has become wholly familiar with clinical technique. Under such trials you must humble yourself and continue to treat your patient with consideration and kindness, never forgetting for one moment that he is an anxious and overwrought person, and that in seeking your advice he has paid you the compliment of admitting you to his life and confidence.

Emergencies teach you how to devote yourself unsparingly to your patients and give that sense of urgency which all good doctors possess. To have a share in saving the life of a patient who is dying from hæmorrhage, peritonitis, respiratory obstruction, or meningitis is an essential part of the doctor's education. You learn then to observe quickly, to pick out the essential points of the illness, to apply first principles of therapy promptly, and to think clearly even when you are wracked with anxiety about the patient's welfare and your own responsibility for it. This anxiety which an emergency arouses in you is an inevitable and normal reaction—enough to numb all thought but for your training. Do not run away from it or seek to hide it beneath swagger and pomposity. Instead, familiarise yourself with it by staying with the patient at his bedside, by helping to nurse him, and by making accurate records of the events as they occur. Student nurses seem to assume their responsibilities in such cases more easily than do medical students; it is the difference between the practical and the theoretical approach to the problem of saving human life.

THE PATIENT'S PERSONALITY

The good doctor, whether general practitioner or specialist, is also a man who studies the patient's personality as well as his disease. In the past this was done by the light of nature: the good doctor started by being interested in his patients as individuals, and eventually his experience taught him to size up quickly most types of mankind and to know the reaction of each type to disease. This was instinctive unformulated knowledge. But now the position has changed, thanks largely to the medical work during the recent war, when we were fighting for our lives and it was realised that the adjustment of each individual to the conditions of war, and his capacity to work and fight, depended as much on his personality as on his physique.

The manifestations of an illness are much coloured by the patient's personality. What you are studying at

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rom an inaugural address delivered at King's College Hospital medical school on Sept. 30.

Such a body could make a thorough study, to take one example, of the efficacy of probation, and the criteria for placing an offender on probation and for prescribing the actual form of probationary care. Dr. John Bowlby held that the new research should be planned on the assumptions that the extent to which any of us conform to social codes is a matter of degree; that those who violate social codes do so for various reasons and can be grouped accordingly; and that we must not confine our attention to those brought before the courts, but must study antisocial behaviour wherever it is found. This generous programme should ensure that any such research body will be kept occupied for the next few centuries; it could certainly contribute greatly to our present knowledge.

FLUORINE IN FOODS

The Ministry of Education's appointment of a Working Party[1] to investigate the prophylactic effect of locally applied fluorides has once more drawn attention to the dual rôle of fluorine in human nutrition.[2]

In early life the risk of dental caries is reduced by drinking water containing about one part per million (p.p.m.) of fluorine; but many communal water-supplies do not provide this amount. McClure[3] has shown that the urinary fluorine content is a valuable guide to the intake of fluorine. The average diet appears to yield about 0·2–0·3 mg. daily. Most foods contain 0·2–0·3 p.p.m. or less, but tea and sea-foods are notable exceptions; dry tea contains 75–100 p.p.m. and sea-foods 5–15 p.p.m. Cow's milk contains about 0·1–0·2 p.p.m.; and when the cow is fed with additional fluorine the content in the milk is not increased. Nor does the fluorine content of edible plants vary appreciably with differing concentrations of fluorine in the soil and water of the place where they are grown; the high figures occasionally reported for leafy vegetables have been related to atmospheric pollution from nearby industries.

In childhood the average diet does not yield enough fluorine to safeguard the teeth. Up to the age of 16 an additional 0·4–1·1 mg. of fluorine, according to age, should be assimilated each day beyond what is contained in the food and in drinking-water (on the assumption that the optimum fluorine content of drinking-water is 1 p.p.m.). A supplement to make good this deficiency may perhaps be justified.

PROFESSIONAL PROTECTION

> "Who steals my purse steals trash, . . . but he who filches from me my good name robs me of that which not enriches him and makes me poor indeed."

These apt words appear in the latest report of the Medical Protection Society. This report and that of the Medical Defence Union serve once more to remind members of the medical and dental professions of the need not only for unceasing professional vigilance but also for a strong organisation to come to their help promptly. However skilled he may be and however high his standard of conscientiousness and devotion to duty, a doctor or dentist remains at the mercy of the cantankerous, the deliberately difficult, and the malignant. We are but human and all of us make mistakes; moreover, in these days, a nodding acquaintance with medicine through the popular press sometimes leads the public to expect much more than we can perform. Having read about some "miracle cure," the person who does not progress as rapidly or as satisfactorily as he would wish is often inclined to blame the doctor rather than the drug. Now that everyone has a right to treatment under the National Health Service there is probably a greater tendency to complain. Complaints are made about the doctor's manners, or about his slowness in visiting the patient; or he is accused of examining less fully than the patient had expected or, alternatively, more fully than the patient had desired. Every complaint sent to an executive council must be investigated; the doctor must be asked for his observations; and sometimes there must be a hearing. Whether a hearing takes place or not, it is certain that the doctor needs at a moment's call the counsel of experts, and he needs at all times the sense that behind him are staunch and willing allies.

Happily the need is met—and very well met—by the medical defence societies. On Sept. 24 we reported the annual meeting of the Medical Defence Union (49, Bedford Square, London, W.C.1.), and this week we report the annual meeting of the Medical Protection Society (Victory House, Leicester Square, W.C.2) at which Sir Ernest Rock Carling gave some wise advice. For our own part we think it important that all reasonable complaints by patients should be aired, whether they are made against the service as a whole or against individuals. But even quite a small complaint can cause much trouble and distress to a doctor, and nowadays it is little short of folly to practise medicine of any kind without taking the obvious precaution.

SEDORMID AND THROMBOCYTOPENIC PURPURA

'Sedormid' (allyl-isopropyl acetyl urea) has long been known to cause thrombocytopenic purpura; the first case was described in 1933,[1] and of those reported in these columns the latest was published last year.[2] This complication is due to hypersensitivity, and once it is established even minute doses may produce purpura. Ackroyd[3] concludes from a study of 3 cases that in purpura due to this drug there is both a capillary defect and a fall in the platelet-count. He has found that *sedormid directly affects the platelet-count of in-vitro* blood from sensitive individuals but not from normal controls; in the sensitive it apparently leads to a specific agglutination of platelets. He has also shown, however, that in sensitive subjects sedormid applied as a patch test can *cause local hæmorrhages in the absence of general* increase in capillary fragility or of thrombocytopenia. As a measure of sensitivity the in-vitro test which he describes may prove a satisfactory alternative to the test dose, which is not always free from danger.

Thrombocytopenia due to drugs is uncommon; but sedormid ranks relatively high among the causes. Other drugs of the same group—the open-chain ureides—do not apparently have this effect.

WORLD MEDICAL ASSOCIATION

Twenty-four countries are to be represented at next week's meeting in London of the World Medical Association. This association, membership of which is open to national medical associations, was formed at a meeting in London three years ago[4] and has as its first aim the promotion of closer ties among the national medical organisations and among doctors. Dr. Charles Hill, secretary of the British Medical Association, will preside over next week's meeting which begins on Tuesday. It will have before it the reports of committees which have been studying social-security schemes, post-graduate education, the wording of an international code of medical ethics, the relation of the profession to the medical press, and the "standards of medical care and allied subjects"—including such matters as unqualified practice and the advertisement and sale of patent medicines.

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[1] See *Lancet*, Sept. 3, p. 446.
[2] Murray, M. M., Wilson, D. C. *Ibid*, 1946, ii, 821.
[3] McClure, F. J. *Publ. Hlth Rep., Wash.* 1949, 64, 1061.

[1] Dennig, H. *Münch. med. Wschr.* 1933, 80, 562.
[2] Instone, S. *Lancet*, 1948, i, 869.
[3] Ackroyd, J. F. *Clin. Sci.* 1949, 7, 249.
[4] See *Lancet*, 1946, ii, 501.

AMERICAN HOSPITAL CONVENTION

FROM A CORRESPONDENT

FTER the fantasy of New York, Cleveland (Ohio) as almost sedate. In the early morning mist the impression was indeed rather one of Edinburgh. eland is an ideal city in which to hold a convention. hotels are large and comfortable, and there is a y impressive public auditorium.

he importance of the 51st annual convention of the erican Hospital Association is evident both from the iber and quality of those attending—and this con- tion is representative of all groups interested in the of the patient. The programme keeps a nice ince between discussion on future policy on the one d and the technicalities of hospital planning and inistration on the other.

he main preoccupation of hospitals at present is to ntain independence and at the same time secure financial assistance so necessary to meet rapidly rising ts. The problem was well put at the first general tion by Professor Dimock, a political scientist, who icated the extremes of State and voluntary control l suggested the middle way of coöperation. He was owed by a speaker on the hospital service which anised labour desires. Mrs. Eugene Meyer, of the *shington Post*, then spoke on what the public is ecting from hospitals, and it was interesting to note t she included a firm demand for more medical adminis- tors. Senator Lister Hill's announcement of recent islation to provide more Federal funds for hospital rposes was received with applause.

The next general session dealt with approaches to the tribution of hospital care. Government programmes re described by Dr. Mott, of Saskatchewan, Dr. Hershey, British Columbia, and Dr. A. L. Banks, of the British nistry of Health, and these contributions were cussed by a panel. The anxieties facing the hospital rld in the United States were again brought out. e traditional desire for independence was illustrated Father McGowan when he declared “ No government ould do for the people what the people can do for emselves ” and that “ those who roll up their sleeves dom ‘ lose their shirts.’ ” Mr. J. Douglas Colman phasised the benefits of the Blue Cross scheme, which w covers 61,000,000 people. It was clear that in the ckground is the fear of the Welfare State, and Dr. well Reed summarised the general opinion when he id that the United States has no need to hurry and at time for experimentation would be well spent.

It was interesting to feel the sympathy toward itain and the British experiment. To the observer seems clear that the eventual pattern in the United ates will take the form of substantial Federal grants ith a minimum of central control, allowing experiment individual States and Territories. The incalculable ctor is the operation of pressure groups which play ich a dominating part in the American politico-social onomy. The power and force of these pressure oups is startling to the newcomer.

The technical discussions, both formal and informal, re stimulating and depressing to an Englishman. edical men meet late at night and early in the morning he breakfast-discussion group is at first a rather trying henomenon). Their talk is not of terms and conditions f service but of the future, and they are full of optimism. rchitects show plans of dream hospitals which are ctually being built. The exhibition of course is a kind of hospital fairyland. One thing is quite clear. If we, n Great Britain, are to keep abreast of developments n the United States we must be prepared to send a onstant stream of young men there to study. This pplies particularly to business methods in hospital administration and finance.

MEDICAL PROTECTION SOCIETY

Sir ERNEST ROCK CARLING, presiding over the annual meeting on Sept. 28, said that applications to this society for assistance, of very varied kinds, now average more than forty a week. The society could assist members at hearings by medical and dental services committees, and would like to have the earliest possible information of any charges made. Members should obtain the secretary's help before answering any letter on this subject from the clerk of the executive council.

Year by year, continued Sir Ernest, the society had exhorted practitioners not to omit radiography in any case of injury where negligence might later be alleged. It had lately been suggested that the shortage of films and the pressure on radiological departments were such that this precaution should be discontinued and the public should be educated to understand that films were sometimes unnecessary. But it was the legal profession, not the public, that needed educating in this matter, judging by the terms of their accusations against doctors, and he earnestly hoped that members would continue to take X-ray photographs whenever the occasion suggested it.

Speaking of the constant need for care, Sir Ernest referred particularly to intravenous fluids and the risk of injecting thiopentone into the tissues, to the damage done not only by applying plaster-of-paris too tightly but also in removing plaster or even adhesive dressings unskilfully; and to the perennial question of swabs left in the abdomen and elsewhere. The time has come, he thought, for an inquiry by some authoritative body, into the best methods of controlling swabs. Also cases still arose in which teeth were knocked out by gags, and the responsibility for putting the gag in position and keeping it there ought to be clearly placed on one person—either the surgeon or the anæsthetist. Finally, when needles were broken, the parts should be kept for examination by a metallurgist: in all those sent by the society for examination a defect had been found.

Mr. W. M. MOLLISON said that in the past year the expenses per member had exceeded the annual subscription of £1; but, with reserves at £112,407 the council did not feel that the deficit justified an increase in the subscription.

The annual report shows that almost 1800 new members were elected during 1948, and that the total income was £26,662. The excess of expenditure over income (£1528) was partly offset by a profit on the sale of investments, and the accumulated funds were reduced by only £583. The society's financial resources at the end of the year were estimated at £146,814. In addition it is reinsured with Lloyd's underwriters in respect of any sum above about £10,325 which it may have to pay by way of adverse costs and damages in any one year. The report contains information and advice on the legal problems of sterilisation, certificates, evidence in court, and fees to witnesses, and also summaries of illuminating cases. It points out that “ an assistant may seem less liable than a principal in that he works under the direction of the latter, but he is certainly not immune from legal actions arising out of his professional work. *Any* practitioner is in law responsible for his professional acts and omissions and the fact that a principal can be sued on account of the acts of his assistant in no way decreases the assistant's responsibility. A locum tenens, on the other hand, does not work under supervision. He replaces the practitioner for whom he is acting. Nevertheless, members are advised before engaging any locum tenens to satisfy themselves as to his credentials, as a practitioner must take reasonable care to ensure that his deputy is a registered practitioner. . . . Under the National Health Service Regulations a practitioner is responsible for all acts or omissions of any practitioner acting as his deputy or assistant in relation to his obligations under the terms of service.”

Sir Ernest Rock Carling was re-elected president, Mr. W. M. Mollison treasurer, and Dr. A. R. French secretary.

the bedside is not disease, but disease in a patient. When you are asked to stitch up a cut finger it may not seem to matter very much what *type of personality* the patient has; though it is rather fun to try and find out without taking too much time about it. But if the patient has broken his leg, or has to undergo any long illness, his subsequent successful return to his work, and his happiness at home, will largely depend on what type of man he is, and the particular measures which are taken to deal with his reactions to illness. Of the people who are suddenly removed from their normal life by breaking a leg, some may be perfectly philosophical and sensible, with assured jobs to which they promptly return when the leg is mended; but others may be so constituted or circumstanced that they are *consumed by genuine or imagined worries which will* produce strange symptoms—symptoms which are not in the textbooks. And if not treated these symptoms will interfere with the patient's return to normal life.

The study of your patients' personality is not a matter for the psychiatrists: it can be formulated on systematic common-sense lines and it is something which all doctors can do themselves. And it can be learned by the medical student. What it amounts to in essence is that in addition to studying the patient's disease you find out about his life and work and family background. If you are prepared to give the time to listening to what he has to tell you of himself, you will be richly rewarded, not only by rapidly acquiring a knowledge of human nature but also by increasing your effectiveness in treatment. And the patient will have much more confidence in you than if you merely regard him as a case.

MEDICINE AND THE SCIENCES

So far I have talked about the art of medicine and now I must say something about the science, and its relations with the other sciences. It must already be clear to you that progress in clinical medicine is largely dependent on advances in the basic and biological sciences. In my student days, when we passed our examinations in physics and chemistry and even in the preclinical subjects, we often said to ourselves: "Thank *goodness that's over and done with.*" This was a short-sighted policy, and with each new application of science to medicine—such subjects as electronics, modern statistical methods, radioactive isotopes, and the application of plastics in surgery and dentistry—I find myself regretting my lack of basic scientific knowledge.

No-one can hope to keep up with more than a fraction of the research work going on, but, such is the pace and power of scientific progress that it is essential for your competence and your intellectual comfort as doctors that you should maintain a general interest in scientific matters. This sounds a tall order, but it is surprising how much you can glean from the popular scientific journals and from talking to your scientific friends. Never forget how very much in medical science is still unknown. Beyond the established knowledge set out in your textbooks there are many things which will be discovered in your lifetime, often with profound influence on your medical practice.

What part can the clinician himself play in research? There is scarcely a disease in which a thorough and sustained clinical investigation will not add new facts, and occasionally discoveries of outstanding importance can be made by clinicians who keep good records and are alert to observe the unusual. A recent example is the discovery by Gregg, an Australian ophthalmologist, that german measles in the early months of pregnancy may seriously damage the organs of sight or hearing of the fœtus. The application of scientific discoveries in the clinical field—for example, the application of new remedies—also requires careful clinical research; and the whole clinical field is full of problems which can be *worked out by a combined attack* in the wards and laboratories.

One must be prepared to approach one's clinical problems on the broadest possible basis. In the last *50 years with the growth of specialisation there has been* a dangerous narrowing of medical activities. I can best illustrate this trend by reminding you that Lister was appointed professor of surgery at this hospital his inaugural lecture was mainly on the fermentation of milk. What would people think today if a professor of surgery gave a lecture about milk? They would say that he was neglecting surgery and encroaching on the field of the bacteriologist or hygienist. But to Lister it was a perfectly natural thing to do. Bacteriology was a young subject to which surgeons as well *as others were making important contributions.* Lister owed his discovery of antiseptics to two things: first to his thorough and persistent study, at the bedside and in the laboratory, of the healing of wounds; and secondly, *to his broad approach to the problem.* When his colleague Thomas Anderson, the professor of chemistry at Glasgow, said to him one day: "By the way, have you read the papers of a French chemist, Pasteur, on fermentation?" Lister read these papers and with his prepared mind at once realised that it might be the living germs described by Pasteur and not the oxygen of the air which caused wounds to putrefy. And so began his use of carbolic acid. In the lecture on milk Lister was proving again for the sceptics that there was no such thing as spontaneous generation and that *the bacteria in the wound came in from the air.* This principle was essential for his antiseptic system. And also in this work with the *Bacterium lactis* Lister developed a successful technique for obtaining a pure culture of a bacterium, and this was the first time it had been done. Thus Lister approached his problem not only as a practising surgeon but also as a pathologist, as a bacteriologist, and as an experimenter; and, as I have advised you to do, he cultivated his scientific friends. The chemist Thomas Anderson, I have been told, not only drew Lister's attention to Pasteur's papers but also told him about carbolic acid as a possible disinfectant.

CONCLUSION

You may be thinking that I have been holding out to you ideals which are impossible of attainment. I have been urging you to become good doctors, to keep up with scientific progress, and to undertake research. *How can one man do all these things?* The answer is that no-one can excel in all fields. You will evolve in different ways. Most of you should become good doctors; some will take readily to research, while others —and they will include many *good doctors*—will have no aptitude for it. But I do think that nearly every young doctor should try his hand at one investigation—should try to carry knowledge of some disease or symptom or function, or the effect of *some form of* treatment a stage further than it has been carried before. Otherwise he will not find out what he is good for, nor will he appreciate the difficulties and labours involved in discovering new things.

I have not said anything about material objectives—careers, salaries, and so on. In medicine direct pursuit of *these not unimportant* aspects of life is apt to prove disappointing, and the greatest personal success is usually incidental to a life spent in service to patients or in research. That is one of the dignities of our profession. *We are still, I am thankful* to say, a guild; and in the course of your careers you will receive much help from your seniors which you cannot hope to repay, except by passing it on to the next generation.

Parliament

Value of Our Social Services

the House of Lords on Sept. 27, in opening the te on the exchange value of the pound, Lord son reaffirmed the Government's determination to intain those services for the children, the aged, the and the unfortunate for which this country is the er among the nations." Other Noble Lords, how- found themselves unable to be equally reassuring.

unt Samuel said that many of the measures lately ed had been advocated by the Liberal party for y years. The new National Health Service was lutely right in principle. The old inadequate service a disgrace to the country, and there was an insuffi- y of hospital accommodation, maintained only by ing around for voluntary subscriptions. But the of the National Health Service had proved to be far ter than even its authors expected and it now lved a charge of £260 million. National Insurance, onal Assistance, and family allowances cost a further million. Not only were these services costly icially, but they were also costly industrially, their administration withdrew from productive loyment many thousands of people. The present ernment, he continued, might say "We shall never the social services: they must be maintained at all s." But they might raise the price of grain and of t, and in a family with a number of children this ld have the same effects as if allowances were cut, by one shilling a child.

ord Balfour of Burleigh pointed out that Lord eridge had postulated 3% temporary unemployment. present percentage was $1^1/_2$%, which meant that 250,000 people were unemployed out of the working ulation of 20 million. He submitted that this over- employment was hindering the redistribution of our our force to essential industries. He hoped he would acquitted of lack of sympathy either with social ism or with continuing unemployment, but he felt t we must have retrenchment and reform if we were get out of our troubles. We had reached the point en we could not pay for all the desirable objectives wanted. We must choose between the more essential l the less essential, and he did not think it fair of the ernment to dodge that issue. It was common und that there was waste in the health service which st be eliminated, but he would go further. People, suggested, did not appreciate a thing when they ught someone else was paying. He advocated the position of a token charge for services received under great health schemes with, he would at once add, eguards for the indigent.

iscount Bruce of Melbourne deplored the Govern- nt's apparent suggestion that devaluation was an ernative to unemployment and cutting down the ial services. The Chancellor should have told the ople that devaluation was the only trump left in his nd, and that if it failed to take the trick there was no ernative to unemployment, a lowering of the ndard of living, and a reduction of our social services. rd Bruce urged that we should immediately frame a o-year emergency programme—including reduction in penditure on the social services—which should be bmitted for endorsement at an early General Election.

Opening the second day of the debate, Viscount witt, the Lord Chancellor, affirmed that sickness and health caused the greatest waste of all in this country. oper safeguard of the health of the people made for ficiency. It would be wrong to interfere with the ope of these services though he agreed we should try get rid of all waste and extravagance which may lie thin them. On a division the Opposition's amendment as carried by 93 to 24.

The Chancellor's Views

Sir Stafford Cripps, who opened the debate in the House of Commons, called upon the people for full operation with the Government in achieving their nancial and trade aims while maintaining full employment and safeguarding the social services. The Government, he said, were under no illusion as to the gravity of the decision they had taken, nor did they underestimate the effect it would have upon the life and livelihood of the people. They also appreciated that devaluation was bound to have an impact upon practically every other national economy throughout the world.

Dealing with the measures which it would be necessary to take to deal with the situation, Sir Stafford Cripps said our internal expenditure must be limited. We must not allow our desire to have more than we could afford to endanger our present standards, as it would do unless we reduced the inflationary pressure which was again present in our economy and which the new circumstances might intensify. The two domestic uses of the goods and services we produced or imported which competed with the consumers' market were capital investment and Government expenditure. We must look to both of these to provide some easement of inflationary pressure. The Government were not prepared to reduce the scope of the social services provided for the people. But they must economise to the utmost and avoid all waste in those services just as in others. Because they meant to continue those services it did not mean that no economies could be made.

Mr. Oliver Stanley contended that it was both dishonest and dangerous to say that there was a choice between two policies—one of mass unemployment and the lowering of the social services, and the other, which the Government had adopted, which would safeguard both these things. No-one would pretend that the expedient which the Government had adopted did anything to safeguard full employment or the social services. On the contrary, it increased the risk of both.

On the second day, Mr. Winston Churchill moved an Opposition amendment welcoming the financial and economic measures agreed upon in Washington, but regretting that the Government, as a result of four years of financial mismanagement, had now been brought to a drastic devaluation of the pound sterling. The motion also expressed the view that a return to national prosperity, the maintenance of full employment, and the safeguarding of the social services, could never be assured under the present administration. In concluding his speech, Mr. Churchill said there was no reason why the struggle of the masses for a more spacious life, for shorter hours, for constantly improving conditions of labour should not be crowned with increasing success provided that mistaken guides did not enforce the rule that all must come to the table at once or none at all.

Mr. Clement Davies intimated that the Liberal party could not support the Government motion. He said that no-one wanted to cut welfare, national insurance, and so on, but would not the Government realise that through the food subsidies they subsidised incomes that did not need it? They should increase the grants to the lower-income groups and increase family allowances. Mr. Quintin Hogg pointed out that the devaluation of the pound meant that every social service in the country had been cut. The poorest in the community would be hit the hardest. The Minister of Health was jeopardising the future of the National Health Service by riotous and extravagant administration. That administration had pursued a corrupt and demoralising progress and there was no effective machinery by which the public money and interest could be safeguarded. He would be surprised if the Chancellor survived to another Budget and did not institute some reform in that service.

Summing Up

Mr. Aneurin Bevan, the Minister of Health, opened the third day's debate with a vigorous fighting speech. He reminded the Opposition that the last favourable balance of payments which this country had enjoyed was in 1935. In the years 1936, 1937, and 1938 the average number of unemployed was 2 million. If those people had been at work consuming imported foods and raw materials there would have been a catastrophic financial crisis. The present Government came into office in 1945, and by the last half of 1948 the country showed a favourable balance (of £30 million) for the first time since 1935. That excluded Marshall aid. The

Disabilities

40. ESSENTIAL HYPERTENSION

As a disability for females I can thoroughly recommend mine. It has every modern advantage over the vapours, the greensickness, and the decline, while retaining all their more agreeable features. I suppose I have had it —or the tendency to it—most of my life, for when, as students, we all had our blood-pressures taken for some piece of research or other, I was always 140/100 while my contemporaries were an orthodox 120/90. At the time I put it down to anxiety about examinations; we were great on anxiety in my family. I grew from a thin active anxious little girl to a stout anxious depressed adolescent, and then to a plumpish maturity in which moods of gaiety and depression fluctuated. But as the years went by and (as I suppose) my blood-pressure rose, I became *more uniformly cheerful*; and now at forty-eight I suspect my almost continuous euphoria of being a symptom of my state.

The diagnosis of hypertension was made quite by chance five years ago. I had gone to my doctor about some bleeding from my bowel, which I supposed to be due to piles. But I had no piles, and I had had several hæmorrhages under the skin in various parts of my body; she said I had purpura and must see a consultant. Then she casually took my blood-pressure and shocked us both (she was an old friend) by finding it was 240/120. I felt quite well, and said so rather crossly; but when we came to look at my story more critically this didn't seem quite true; for I had been getting more and more breathless in my Sunday climbs about the hills, and my ankles had been swelling a bit, and in bed at night my heart-beat thundered in my ears. So I saw a consultant, who said that there it was, I had essential hypertension, and that I would live the sort of life that people with hypertension live, probably feeling splendid, and that in the end I should die as hypertensives die, probably from a stroke, and who could ask anything better? I agreed warmly with every word he said, and decided to take no further notice of my blood-pressure as long as it caused me no annoyance. He looked into the purpura carefully, and that turned out to be obscure but irrelevant: if I had been in my 'teens they would have called it Henoch's purpura; as it is they keep silent.

The next thing that happened, about a year later, was a hæmorrhage into my retina—a tiny one, but enough to blur central vision and to send me back to my consultant in a great state of excitement. He was superbly reassuring. It was a purpuric hæmorrhage, he said, nothing to do with the hypertension, and it would clear up, leaving very little disability. As usual, he was perfectly right: that is exactly what has happened. All the same, he sent me to bed for a month, and told me I must take life more easily. He was not unreasonable in that, for I have a weakness for complicating my life; and at that time I was doing a full-time job, travelling up to it daily from the country, keeping house for two partial invalids, doing a good deal of the cooking, making most of my own clothes, and producing plays whenever I got the opportunity. It does seem rather a full programme, looking back, but it didn't seem anything special at the time. That is the great charm of hypertension: one goes at things like steam. An operation—also irrelevant to the main story—retarded my return to work, and when I was taken on again it was as a part-timer: so for the rest of the week I now put my feet up.

But of course there are more ways of being active than by climbing the Matterhorn; and as it happens I have always been rather lazy physically, so I take kindly to this Elizabeth Barrett Browning life: or I would if we always had a char. I still do some of the cooking, which I like; but I live nearer my work, and thanks to the conviction of my doctor that I need it I get petrol to take me there. I don't make as many clothes as I did, and I haven't produced any plays for longer than agrees with me; but I have managed to fill up my time in other ways—by writing and lecturing and so on. I can't pretend, even to my consultant, who always incites me to idleness, that I don't work full-time; but it is in my own time, and largely in my own home, which I find congenial.

The reward of this relative virtue is that my condition has remained stationary, and even improved slightly in the last five years. My last blood-pressure reading (it gets done about once a year with luck) was 220/1 The purpura reappears occasionally and does its st but it has kept out of my retinæ, which is good enough for me. I sleep well, I eat rather too well, I very rarely (about once a year) get a headache. My heart-beats have ceased to pound in my ears when I put my head on the pillow; I can't think why, on the evidence. Perhaps this is a purely psychosomatic symptom. I can get tired when I do too much physically, notably if I go rushing round London in buses and trains; but who doesn't? This summer I swam and played gentle tennis and felt all the better for it, though my family watched my first dive with the air of people about to hear a loud explosion. Incidentally, kindly concern can go too far; it is no pleasure to the subject to be treated as though his next act will be his last. Relatives should try to live and let live.

"Suppose we had done a sympathectomy on you five years ago," my consultant said, at my last visit, "how pleased we should be with the result." Suppose I had gone on doing just what I was doing, I couldn't help thinking, should we perhaps be equally pleased? Are *some* people wound up to go at my pace, just as some cars do better with the engine running faster? I put the thought politely into words. "Why," I asked, "am I not as good as the next woman?" "In some ways," he replied (but after a pause), "you are, as you know, better." By which I suspect he meant that it *pays me to go quietly*.

He went on to tell me that on the whole women take essential hypertension—and indeed all kinds of hypertension—better than men; that he had had women like me coming up to his outpatients with little change for twenty years. It seems there is no known explanation for this difference, so I shall put *it* down to the Y chromosome.

Well there it is: I offer the suggestion to any woman who would like to be urged to rest and let someone else do it, to be treated with tenderness and concern by her family, to put her feet up for several hours a day, to be encouraged to go by car or take a taxi, and yet to feel brimming with health and energy, and to last for years with the hope of a quick finish at the end of it. Essential hypertension is the name.

Medicine and the Law

A Further Death From Hepatitis

LAST week (p. 630) we described the investigation, by the St. Pancras coroner, of the death of three children who developed hepatitis after serum had been injected for the purpose of protecting them against measles. On the same day the same coroner inquired into the death of a 66-year-old woman who, after operation in hospital, received blood-transfusion. According to the *Manchester Guardian* (Sept. 27), a pathologist reported that the case was comparable with those of the children except that in the children death followed the injection of serum. The coroner, returning a verdict of death by misadventure, remarked that the accident was very rare and was no argument against blood-transfusion.

Poliomyelitis

ring the week ended Sept. 24, notifications in and and Wales numbered: poliomyelitis 268 (311), encephalitis 27 (31). The figures for the previous are shown in parentheses. This is the first substan- fall since the rise in notifications began in the ty-fourth week of this year. The curve generally followed that of 1947 fairly closely and it is to be d that the decline, which began that year in the week d Sept. 13, has now set in.

ltiple cases (poliomyelitis and polioencephalitis ther) were reported from the following counties: lon 48 (41), Berkshire 3 (7), Chester 7 (4), Cornwall), *Devon 5 (5), Dorset 4 (3), Essex 17 (18), Hertford*), Kent 18 (16), Lancaster 24 (29), Leicester 5 (13), s, Holland 4 (1), Lincs, Lindsey 4 (6), Middlesex 20 Norfolk 2 (3), Northampton 4 (3), Northumberland 10), Nottingham 9 (11), Oxford 3 (0), Peterborough, of 2 (1), Somerset 7 (8), Southampton 8 (10), lk, East 5 (1), Surrey 11 (14), Sussex, West 2 (1), wick 8 (10), Westmorland 2 (0), Wiltshire 9 (6), s, West Riding 19 (33), Glamorgan 3 (3).

The Changing Population

report [1] issued this week by the Registrar-General s the civilian populations of each local-government in England and Wales, including the numbers of sex at various age-groups. The report also serves raw attention once again to the changing age- ibution of the population. At Dec. 31, 1947, the to which the report refers, the distribution for the le country was as follows:

e, rs	*% of total*	*Age, years*	*% of total*	*Age, years*	*% of total*
	8·5	35–	8·1	70–	3·2
	6·8	40–	7·8	75–	2·0
	6·6	45–	7·1	80–	1·0
	6·0	50–	6·2	85 and over	0 5
	6·3	55–	5·6		
	7·6	60–	5·0		
	7·5	65–	4·2		100·0

e the 1931 census the proportion of the population er 15 years of age has fallen from 23·8% to 21·9%, the proportion over 65 has risen from 7·4% to 10·9%. percentages for selected years since 1911 are as ows:

Age, years	*% of total population* 1911*	1921*	1931	1939*	1947
nder 15	30	30	24	21	22
5 and over	5	5	7	9	11

rived from figures given in the Registrar-General's annual reports.

he report reveals the following ratio of males to ry 1000 females:

ages	18–19	20–24	25–34	35–44	45–54
40	1017	1021	986	992	988

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[1] timates of the Sex and Age Distribution of the Civilian Population in Regions and Administrative Areas of England and Wales at Dec. 31, 1947. H.M. Stationery Office. Pp. 50. 2s. 6d.

Infectious Diseases in England and Wales

Disease	Week ended Sept. 3	10	17	24*
	25	38	34	35
	53	66	78	92
	98	59	86	78
ephalitis lethargica	2	2	1	4
od-pois	277	212	267	245
	1169	885	688	659
	46	38	54	44
	30	20	18	23
fluenzal	216	205	211	226
	19	22	31	27
	289	284	312	268
rperal pyrexia	108	103	118	88
arlet fever	705	731	943	1097
nallpox	..	..	..	..
phoid fever	9	3	4	8
phus fever	..	..	4	..
hooping-cough	1618	1230	1180	1061

* Unrevised figures.

In England Now

A Running Commentary by Peripatetic Correspondents

ONE of my ex-H.P.S, in writing to me for a testimonial to support his application for an appointment, subscribed himself, "Yours ever, Mick." Now in my day I should no more have assumed this familiarity towards a chief than (when in the uniform of a temporary lieutenant, R.A.M.C), I should have thought of clapping the D.G. on the shoulder with an inquiry as to his well-being. And so, whilst responding to "Mick's" request with a certificate which described him as a sort of composite of the Three Wise Men of the East and the Nine Muses, I pondered the reason for this changed relationship.

In bygone days the chief had an aloofness compounded partly of admiration and reverence, partly of fear. In lesser degree perhaps, this sentiment applied to the domestic circle: we called our father, "Sir"—a title now rarely, if ever, heard in the home. Have we lost or gained by the substitution of affection for respect? Herein at least may lie an explanation for the disappearance of "characters" or "personalities" who acquired their reputation by acts of violence, fits of temper, and other unpleasantnesses for which they seem to be perpetuated in memory by appropriate anecdotes. Yet possibly even we apparent milksops of today are establishing ourselves as personalities by some eccentricity or quiddity of which we are unaware.

* * *

The enforced idleness of what used to be called lumbago and nowadays gallivants as a prolapsed disc has set me wondering. Three days before I did it, and this is the second time of asking, I was diving into a swimming-bath. Suppose it had gone then instead of when I stooped to tie up the errant bootlace. Remember I was locked, immobile, rigid, on the drawing-room carpet. Suppose it had been the bottom of a swimming-bath. . . .

So here's a hint for the next pathologist faced with an inexplicable swimming-bath death. Have a look at the fourth and fifth intervertebral discs.

* * *

"You know," I told the garage man. "I may not know much about cars, but I'm no fool." He was a burly, jocular sort of chap and he eyed me with relish. "You don't need to tell me, sir," he said appreciatively. "We get all sorts here. Now about your car, what you want is a new engine. After all, so long as the engine's good, what does it matter how it looks? You'll have twenty thousand miles of care-free motoring." So a new engine it was. When it had been fitted I did notice a strong burning smell, but I put this down to the fresh paint in the cylinders. Then I broke down again. This time the garage electrician greeted me when I was pulled in. He popped his head under the bonnet and emerged with a charred wire. "I remember this job," he said gloomily. "I told the guv'n'r it needed re-wiring, but he's gone on engines. What I say is, what good's an engine without the wires to make it go?" I think the governor must have overheard this, because after a cursory glance he said: "Ah now, what you need is to have this old car re-wired. After all, if the wiring's good, what is there to worry about? You'll be good for twenty thousand miles of care-free motoring." At the time the words seemed rather familiar, but the goal was so greatly to be desired that I acquiesced. A few days later, when we were out en famille, the dear old car began to make a clanking sound, which I traced in the end to a screw adrift from the off-side rear wheel. I put it on; but after a quarter of a mile it came off. I put it on again; but after ten yards it once more broke loose. With misgivings I privily pocketed the thing and was congratulated by my missus on my skill in stilling the noise. When I took the car into the garage (a different one this time) I got the man to see to this at the same time as he mended a hole in the roof, reunited the choke wire, and sealed up a door that wouldn't close. Every week there's a list of little things like this, but the man has been very patient—he always seems glad to see me. Well, when I went to pick up the car, he drew my attention to a slow flat. "What you need," he pronounced, "is five new tyres." I was just going to agree nation had worked with such industry and skill that they had more than made up for the consequences of the war. Under the guidance and leadership of a Socialist administration Great Britain had advanced further on the road to recovery than any other nation in Europe involved in the war. In the last two generations a new type had emerged in Britain; virile men who realised that they had more to lose by failure and more to gain by success than any other section of the British community. It was to those people that the Government appealed, and they were confident that their appeal would not be in vain.

Mr. **Oliver Lyttelton** declared that the Government policy was to decrease by indirect means real wages and incomes. It had been misrepresented to the people that the social services would be in jeopardy from the Conservatives. Actually the social services were in jeopardy from the decrease in the purchasing power of money.

Mr. **Attlee**, in ending the debate, once more affirmed that the Government did not believe in slashing the social services. Their appeal to the people of this country was this: we have the finest social services that any country has ever had; their maintenance and preservation is a great incentive to all our people.

The Opposition amendment was rejected by 350 votes to 212, and the Government motion was then carried by 342 to 5. The House adjourned until Oct. 18.

The report and third reading of the National Health Service (Amendment) Bill will be taken on Oct. 19 in the House of Commons.

Public Health

LOCAL HEALTH AUTHORITIES AND TUBERCULOSIS

A joint meeting of the Society of Medical Officers of Health and the National Association for the Prevention of Tuberculosis was held in London on Sept. 15 under the chairmanship of Prof. R. H. **Parry**, president of the society.

A BALANCED SERVICE

Sir **Allen Daley** observed that real prevention of tuberculosis was founded on conditions of life—housing, general nutrition, and hygiene. Some years ago he had set out to find whether there was an inverse relation between the decline in tuberculosis and the rate of expenditure on hospital and medical services. No such relation had been discovered. The public-health service should concentrate on the basic conditions affecting the disease, with an especially close watch on nutrition. The second aim of prevention was the isolation and removal of the patient. In cases of tuberculosis the legal power under the National Assistance Act for compulsory removal to an institution was not of much practical value. The chronic ambulant infectious patient who was homeless presented a problem; local health authorities should consider providing special hostels although these would be difficult to manage and control, or alternatively people in houses with surplus accommodation might be persuaded to give rooms to such people. Children in contact with open tuberculosis should be boarded out on the Grancher system; some six hundred London children were being cared for on this ground, mainly in residential nurseries and schools.

Mass radiography was best placed under the control of regional hospital boards, provided that the local health authority advised on its best use; and he advocated X-ray examination of all people in regular contact with groups of children.

Regarding B.C.G. vaccination, if it was necessary to segregate children from infection for six weeks before and after vaccination, were they to be kept in camp schools or special hostels? Education must continue; and perhaps open-air schools and holiday homes would be the answer.

Aftercare requirements he defined as: (*a*) continued supervision of, and finding jobs for, the recovered cases; (*b*) Remploy factories and night sanatoria for chronic ambulant cases; and (*c*) care of semi-bedfast and dying cases, which were the most infectious. The service must not be allowed to become purely curative Ev if the hospitals were centres of treatment, they m have chest clinics as their outposts.

RURAL PROBLEMS

Dr. G. W. H. **Townsend** (Buckinghamshire) that in his experience district councils in rural a had made little use of the wide powers conferred them by the 1930 Tuberculosis Regulations. He thou that welfare work confined to tuberculosis was t consuming, and, it should be combined with that other conditions. At maternity-welfare centres mot waiting to see the doctor were learning all the f by lecture, film, or leaflet, whereas at the tubercu dispensary waiting was just waiting. Here was opportunity for health education on welfare-cen lines.

LOCAL HEALTH AUTHORITY'S POSITION

Dr. **Stuart Laidlaw** (Glasgow) said that evidence was wanted on the relation of overcrowding to tuberculosis. In Glasgow the contact-rate as bad in houses with 2–3 rooms as in those with rooms. The powers of removal under the National As tance Act had not been used because the psycholog effect would be bad.

He disagreed with the attachment of the ch physician to the regional hospital board. The eff had been concentration on the curative and clini aspects, and the domiciliary interest had waned. Glasg had a waiting-list for sanatorium beds of 1660, b there was no chance of admission unless the case w of special clinical interest. The medical officer of hea had no power to enforce admission, so a day-to-d battle was in progress to get cases away from danger home conditions.

He thought that the local health authority sho use B.C.G. through its own staff and regain direct cont of mass radiography. Segregation of children for B.C vaccination was being arranged, and home hel for tuberculosis cases were volunteering from among the relatives if they could be paid at the usual rates.

With regard to Sir Allen Daley's reference to hos accommodation, Dr. Laidlaw described how an em ward in a tuberculosis hospital had been reopened a hostel for 60 discharged patients who shared catering and domestic work.

HOUSES FOR THE TUBERCULOUS

Dr. W. **Alcock** (Burton-on-Trent) said, with rec to housing priority for the tuberculous, that 20 poi were essential to get a house and his department co give no more than 5 on medical grounds. Tubercul families should have a priority claim for rehou outside the "points" scheme. The best hope of co trolling the spread of the disease lay in raising the res tance of (*a*) contacts with active cases, (*b*) all you persons up to 25 years, (*c*) expectant and nursing moth and (*d*) other special categories liable to contra tuberculosis. For earlier detection, he urged repeat X-ray examination of all entrants to industry and t the Services.

B.C.G. VACCINATION

Dr. K. **Neville Irvine** (Henley-on-Thames) spoke o the need to segregate people for six weeks before an after B.C.G. vaccination. If the Mantoux test six wee after vaccination was not positive, there should be anoth test at ten weeks; some people were slower than oth in conversion. If, after ten weeks, revaccination wa decided on, a double dose should be used. Failure t segregate after the first vaccination did no harm; b some might contract the disease before immunity w established, thus damaging the reputation of this for of protection. Vaccinees should be warned about th papule which might appear after 2–3 weeks, and whi sometimes broke down to an oozing ulcer. Ultraviol light cleared up such persistent ulcers with dramatic speed. B.C.G. vaccination was never dangerous.

SOCIAL SERVICES

Miss **Anne Topley** (care almoner, Surrey) insisted that the social worker must be one of the chest-clinic team.

Dr. J. C. **Sleigh** (St. Albans) reported that his council had agreed to give absolute housing priority to the tuberculous where he so advised.

ntroduction of mobile chest clinics together with le motor transport for the patients to and from the . Such a mobile chest clinic, containing an X-ray ing set in a dark room, a dressing-room, and a small ting-theatre for collapse treatment, aspirations, ould easily be run in connexion with the existing, ly conveniently placed, "visiting station" and l provide all the diagnostic and therapeutic facilities t of radiography) of an up-to-date chest clinic. As I ed out, early cases could be admitted early for a stay at the sanatorium—or the hospital—and ment could be continued in these clinics, not too far the patients' homes. The quick turnover in the orium would soon cause waiting-lists to shrink to geable proportions.

is by the adoption of some scheme of early ambula- collapse treatment, after induction of collapse in torium or hospital, that the magic circle which ates most of our patients from timely treatment will roken. If such a new approach to treatment is ined with a more efficient use of mass radiography with large-scale immunisation, then—but only then can hope to control in our time "the last of the zymotic diseases of man in Great Britain."

ywood Hall Sanatorium,
olsingham, co. Durham.
E. G. W. HOFFSTAEDT.

VITAMIN E

R,—Opinion upon the efficacy of α-tocopherol min E) in the treatment of cardiovascular disease been, I am afraid, distorted by two factors.

he first of these is the attitude of some practitioners , not bothering to find out the proper method of inistration or type of product, yield to pressure the patient and simply prescribe any one of the y products in whatever dosage may come to the d of either doctor or patient and for any type of diovascular disturbance. Often the attitude is that en if doesn't do you any good, it won't do you any m." In this regard it should be pointed out that ients with heart-disease due to hyperthyroidism uld not be given vitamin E, since it aggravates this dition. Or if the patient happens to be a diabetic eiving insulin, his insulin dosage will be upset sooner later by hypoglycæmic symptoms. It should also be ed that the threshold dose of α-tocopherol usually between 200 and 300 international units daily, and t smaller doses will have absolutely no effect. No preparations may be given, because these inactivate tocopherol. I use a preparation which is a natural tillate and contains 100 international units of α-tocoerol per capsule. This product is enclosed in a hard psule which is timed to dissolve in about four hours in intestinal tract (rather than in the stomach) for more mplete utilisation and for elimination of gastric mptoms.

The second factor is concerned with aberrations of my iginal method which have appeared lately. Since my iginal observations on heart-disease, arterial obliterae vascular disease, and diabetes mellitus, certain rkers who began using vitamin E in the treatment of ese conditions have proposed "modifications" which metimes greatly hamper the success of this treatment. ne group in particular states that chronic rheumatic d hypertensive heart-disease should first be treated ith small doses and the dose gradually increased. In pport of this contention they say that if the initial sage is 300–400 mg. in a patient with rheumatic heart-isease, right ventricular failure will be aggravated or recipitated. They suggest that the left ventricle becomes ompensated before the right, and that this produces elative right-sided failure or aggravates pre-existing ight-sided failure. I have been treating these hearts with itamin E longer than anyone else and have not seen such esults clinically; and indeed it would require peculiar notions of the ætiology of right-sided failure to entertain this line of reasoning.

It has also been suggested that large doses administered to a patient with hypertensive heart-disease may raise the blood-pressure. Such an increase can be observed initially, but to anyone familiar with hypertension this need cause no alarm. Many hypertensive hearts in failure are associated with a blood-pressure lower than was present when they were compensated. On the administration of *any* compensating therapy, the blood-pressure will naturally rise, but it will not exceed the level before the onset of failure.

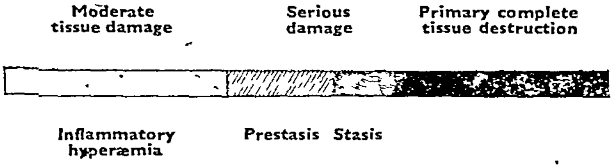
Another misconception is that digitalis must be discontinued if vitamin E is given. It is true that a patient cannot be digitalised by the "massive-dose" technique if he is already receiving vitamin E. The patient can, however, be digitalised in two days by simply giving small daily doses of gr. $1^1/_2$ digitalis folia or 0·1 mg. digitoxin. In general, the heart that needs digitalis also needs vitamin E.

It is to be hoped that this information will help physicians to use α-tocopherol properly, thus enabling them to arrive at a true evaluation of its usefulness.

London, Ontario. ARTHUR VOGELSANG.

VASCULAR STASIS

SIR,—Heat, cold, light, mustard oil, war gases, toxins, and many other agents may damage living tissue to various degrees, according to the dose applied. If the dose is large, or above a certain limit, the tissue may be completely and directly killed—primary necrosis. If the dose is small, the tissue damage is moderate, and the response may vary from a transient physiological reaction to a more severe complex pathological process. Between the two extremes is a state characterised by severe tissue damage with severe vascular reactions (see figure).



The vascular reactions may lead to the development of true stasis—a complete stoppage of the blood-flow in the smaller vessels—in the area involved. If stasis occurs, the tissue will suffer from ischæmia and secondary necrosis will result. As a response to doses below those which lead to stasis, a lesser, but still severe, vascular reaction is found—prestasis—which may lead to complete stasis if the tissue suffers further injury. The condition of prestasis is labile.

Usually the injuries are of moderate severity. In such cases intervention may shorten the process and aid recovery and repair. Where primary necrosis has ensued no therapy is of any use. If the minute vessels are in the state of prestasis, the tissue must be shielded against any further injury which may increase the vascular reaction. For example, a frost-bitten area must be protected against rough handling, protracted cooling, strong radiant heat, and ultraviolet light.

The condition of stasis is still more critical. In man stasis is in most cases irreversible; in lower animals—e.g., the frog—it may be reversible. Stasis is present in many important pathological conditions, but hitherto no intervention for the prevention or reversal of stasis has proved of value. The words of Lister,[1] some 90 years ago, still hold true:

> "But the number and discordance of the views entertained by different authorities regarding the cause of the 'stasis' of the blood in inflammation are sufficient evidence either that the subject demands further investigations or

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[1] Lister, J. *Philos. Trans.* 1858, 2, 645.

when he added: "After all, they'd see you through for twenty thousand miles." That settled it; I got away as soon as I could find the starting handle. This was a fortnight ago; and I must own that I've had two flats since. Was he right, I wonder? I've asked the family, but, in the shiftless way of families, they seem to have lost interest.

* * *

It is many years since the *Victory* was towed away from its moorings in Portsmouth harbour and placed permanently in dry dock; but once again one of the old wooden walls is anchored there—the *Foudroyant*—and conjures up the days of Nelson and his famous signal. These inspiriting thoughts were shattered by a voice booming over her loud-hailer: "All those who want ice-cream come and get it."

* * *

Even if we do feel rather proud of the result of our operation for vaginal stenosis, it comes as rather a shock on holiday to see the front page of the *Sunday Mirror* featuring a photograph of the resulting triplets, and a laudatory caption (fortunately anonymous) about our skill in arranging the advent of not only one but three at a time.

The worst was to come, for our hospital's anonymity had not been preserved and the fan-mail had been collected for reply when we reluctantly returned home to work. Could we, asked one, provide similar service for herself, married 20 years and given up by all other doctors, for were we not the cleverest doctor in the world? "My tubes were removed 10 years ago," wrote another from even further afield, "could some artificial tubes be made?"

* * *

My grandmother once took on a young kitchen-maid at £8 a year; but the girl succeeded in Improving her Position by promotion to cook at £20 a year. Nowadays the labour exchange will have no hand in settling any girl in a resident post which offers a smaller reward than £100 a year. Partly, of course, the difference is due to the altered value of the pound, and partly—I hope—to an awaking conscience among employers. The most important cause, however—and it is not confined to Britain—is the opening now afforded by commerce and industry. Greater freedom is not the only reason for preferring office or shop or factory. In the days of our Victorian grandparents, when labour was cheap and plentiful, a draughty garret or a damp cellar was good enough for the servants to sleep in; and potato pie was often their provender, whatever the family might be eating. From this neglect has sprung the idea—still current, though no longer warranted—that domestic work is debasing. Indeed in one or two countries where these conditions have never prevailed, the housemaid's or cook's is still an esteemed occupation.

The only people who seem to be uninfluenced by the afterglow of the bad old tradition are those whose families helped to form it. Take our household, for instance. Our mother's help is a girl with a château in the west of France which has been in her family's keeping for many generations; and our daily comes of a local Titled Family. *My missus, being of a sociable turn of mind, has always* called a halt for tea and talk in the middle of the morning; and our present daily desists from peeling the veg. to prattle of cavorting with the Highest in the Land. It looks as if, thanks to our mother's help and our daily, our family can look forward to Improving its Position.

* * *

The man behind the counter grumbled when I asked for twenty penny stamps. "This continental method of buying stamps is getting very popular," he said. "A few years ago only foreigners bought stamps in tens, Britishers always asked for them in dozens. We have to alter all our mental arithmetic." I'm sure this proves something. Perhaps American economics have influenced us more personally than we realise.

* * *

The Piddingtons have been on at the Palladium. I hope that their act did not interfere with the Delta Rhythm Boys, who appeared in the same programme.

Letters to the Editor

CONTROL OF TUBERCULOSIS

SIR,—The admirable article of Sept. 24 by Mr .. who advocates B.C.G. vaccination in the most persua manner, will be welcomed by all who have the con of tuberculosis at heart. However, the risk of vaccinat to anybody still exposed to infection has to be Taking life as it is, this risk will "materially reduce field in which B.C.G. can operate, since it necessit pre-detection of the tuberculous household and remo of the infant at birth for some months."[1] No doubt t ultimate aim of control is the devaluation of the My *bacterium tuberculosis* from a potential killer to a harm saprophyte by rendering the host immune to it. M Francis is realistic enough "not to expect B.C.G. t produce such striking results," and to "recognise th there are many difficulties to overcome before this ai is achieved." Together with the long-range weapon *immunisation, we have to use the recognised* stratage of early diagnosis and early treatment.

It is untrue however, that "mass radiography languishing for want of an idea as to how it should used." During the past seven or eight years quite a fe authors have put forward constructive criticisms of t [illegible] scheme; and the council of t [illegible] for the Prevention of Tubercul has suggested a more enlightened policy for the futu What is required now, as Mr. Francis rightly observ is "the imaginative leadership of a campaign in which t weapons . . . will be used." But, alas, this leadership h so far not been provided, and any "change for t better has sprung from the ranks."[3] After many hig level discussions, working parties' reports, and p analyses, not a single nurse has come forward to sta any of the 5670 empty sanatorium beds in this countr *Waiting-lists are as long as ever,* and those patients wh have been diagnosed in time are missing their gold opportunity. Nor is there an efficient case-finding pr gramme; mass radiography is still *squandered* o picking up the random harvest from not very fruitf routine surveys on volunteers.

The alarming bed situation has led a few thoughtf and courageous chest physicians to consider "the ques tion of an alternative to sanatorium treatment." Various schemes of combined domiciliary and clin treatment have been devised in order to circumven the bottleneck of sanatorium accommodation. Th London scheme,[4] [5] where inductions are carried out i the patient's home, will not appeal to all chest physicians and it could not succeed in the hands of less experienced doctors. *The excellent* Glasgow scheme[6] depends o some hospital beds being at the chest physician's dispo for the induction of collapse, and on properly equipp clinics with at least screening facilities. These essentia prerequisites are often lacking in our provincial di pensaries, which, more often than not are mere "visiti stations."[7] On the other hand, the intended transfer o these clinics to outpatient departments of adequatel equipped local hospitals—with beds and X-ray faciliti at the chest physician's disposal—looks under presen circumstances like a dream belonging to the "Never never Land of long-term planning."

I have, therefore, recently suggested[8] that the most practical remedy for semirural and also for certain industrial areas where things are really bad, would be

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1. Hill, A. Bradford. *Brit. med. J.* 1948, i, 274.
2. See *Lancet*, 1949, i, 503.
3. Leading article, *Tubercle*, 1949, 30, 97.
4. Heller, R. *Ibid*, p. 204.
5. Pritchard, E. K. *Lancet*, 1948, i, 302.
6. Maclean, A. G., Gemmill, J. S. *Ibid*, p. 173.
7. Ridehalgh, F., Aspin, J. *N.A.P.T. Bull.* 1949, 12, 31.
8. Hoffstaedt, E. G. W. *Brit. J. Tuberc.* 1949, 43, 36.

TORSION OF APPENDICES EPIPLOICÆ

r.—I read with great interest the article by Sir Cecil eley and Mr. Childs in your issue of Oct. 1. In view e comparatively few recorded cases they were able d. may I report the brief case-history of a patient rated on three years ago ?

married woman, aged 26. with three children. was tted to St. Charles' Hospital in August, 1946. as a case of plete abortion. Her last menstrual period had ended 7 weeks previously. A dilatation and curettage was med and the following pathological report was received e material removed at operation : "Fragments of blood-hæmorrhagico-necrotico-purulent decidua and inflamed metrium." The first 4 postoperative days were uneventful. arly on the fifth day the patient complained of nausea pain in the lower abdomen and back. Her temperature, , and respirations were normal and her tongue moist coated. The lower quadrants of her abdomen were r on palpation. Findings at vaginal examination were stent with her gynæcological condition. At laparotomy urs later a twisted and gangrenous appendix epiploica e transverse colon was found and excised. The abdominal d healed by first intention.

den, N.12.　T. A. QUILLIAM.

EXCISION-SUTURE TECHNIQUE IN INFECTIONS OF THE HAND

R.—In answer to Mr. Ross's letter of Sept. 3, we ld emphasise the following points :

We have at all times made a careful search for gns ; in our experience they are often present early, icularly in pulp infections.

. The risks of lymphangitis or septicæmia following method are small even without chemotherapy. h chemotherapy these complications are completely vented.

. In none of these cases did we incise a cellulitis : ll 99 cases open pus was obtained.

Unless we felt certain that pus was present, the was treated conservatively by immobilisation and motherapy.

. The main advantage claimed for this method is y healing, comfort to the patient, and early recovery unction.

ng Edward VII Hospital,
Windsor.

G. P. ARDEN
A. P. KITCHIN
H. D. W. POWELL.

CHLOROMYCETIN IN ENTERIC FEVER

IR,—I read with great interest the letters last week Dr. Kiledjian and General Tutunji. I was specially erested in case 1 reported by Dr. Kiledjian because le is known as yet about the action of chloromycetin paratypoid-B fever.

The only other report I know of is on a series of ases briefly described by Christie.[1] I should therefore e to report the following case.

A single woman, aged 46 years, was admitted on Aug. 20 s year. She had been taken ill with general malaise, severe adache, and fever on Aug. 14, the day after her return m a holiday in Majorca.

On admission her temperature was 100·1°F, and pulse-rate per min. The tongue was coated, and she looked dis-ctly toxic. There was no bronchitis. The abdomen was a tle distended, with tenderness and gurgling over the cæcum ; e bowels were costive. The white-cell count was 6700 per mm., with 81% polymorphs.

She ran a continuous fever around 102°F. and on Aug. 23 o rose spots appeared on the abdomen. Blood-culture on at day gave a growth of *Salmonella paratyphi-B*. Agglutina-ons were positive for that organism in dilutions of 1/640 "H" d 1/20 "O." Stool and urine cultures have been negative roughout.

Treatment with chloromycetin was started on the evening of the 27th (13th day of the disease), with an initial loading dose of 4 g., followed by 0·25 g. 3-hourly. There were no untoward effects, but the fever continued. On Aug. 30 the dose of chloromycetin was stepped up to 0·5 g. 3-hourly. The next day the temperature fell by crisis and has remained normal since. On Sept. 3 the dose of chloromycetin was reduced to 0·25 g. 3-hourly, and treatment was discontinued on the 7th. A total of 34 g. was given.

All blood-cultures subsequent to chloromycetin treatment have been negative. The organism recovered from the culture of Aug. 23 proved to be twice less sensitive to chloromycetin than a strain of *S. typhi* held in the laboratory.

This case shows that chloromycetin has definite therapeutic action in paratyphoid-B fever, but that the dosage required may be greater than that for treatment of typhoid fever.

I wish to thank Dr. J. Alston, of the Archway Group Laboratory, for the pathological investigations.

Highlands Hospital, London, N.21.　E. MONTUSCHI.

THE REGISTRAR'S SALARY

SIR,—Your correspondent, Dr. Gee (Sept. 24, p. 580), invites several comments. From his own account he appears repeatedly to have fallen on his feet. He qualified after the war was over and gained the M.R.C.P. diploma at an unusually early stage of his career. He has been in the Services, presumably as a specialist, for two years only. Since demobilisation he has been allowed to work hard (which is what I take it he means by "ruining my health"). He complains that of his salary (£7 16*s*. 2*d*. a week) 9% must be spent on books and subscriptions necessary to the maintenance of his standards. Why the "must"? He should do pretty well in this line for £36 a year. Subscription to the B.M.A., THE LANCET, the Royal Society of Medicine, and a couple of the specialist publications should not set him back more than £12.

He is set with his foot on the second or third rung of the ladder and he jumps off because he cannot manage to live on £600 a year *net*. Passing over the problems of clergymen and schoolmasters, who seem to manage somehow on far less, may I remind him that there are many others in the queue hoping one day to fill the mythical "shortage of specialists?" These people qualified even before the war, spent five years or more uncomplainingly as R.M.O.s or squadron medical officers, acquired two or three children and a car also, and have lived on "subsidised cups of tea" for two or three years at a salary of £450 rising to £650 *gross*. Under these conditions they have gained higher degrees and diplomas, and engaged in original work. However desperate their case has seemed, their sense of vocation has kept them hoping. Surely money is not everything in medicine. A congenial job is at least as important.

As I am still breathing, may I sign myself

DUM SPIRO SPERO.

SIR,—It is to be hoped that your correspondent of Sept. 24 will not remain embittered for life at a "system" which has deprived him of the glittering prizes of a specialist career. I venture to suggest that in six months' time the gilded vision of such a life as he has no doubt conjured up will have faded considerably, and that general practice will appear to him not such a bad way of doing medicine.

However, a word of warning. The "comparative opulence of general practice" of which he speaks is a myth, at any rate under the National Health Service. He will find that exchanging even a small town flat for a house from which to practise carries with it increased financial commitments which rapidly swallow up any increase of income. And if he found work as a junior registrar in hospital ruinous to his health, then a winter in general practice will surely drive him to his grave !

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[1] Christie, A. B. *Post-grad. med. J.* 1949, 25. 410.

else that it lies beyond the reach of human means of research."

To improve the treatment of damage due to cold, heat, actinic insults, toxins, and many other agents, a systematic study of the prevention or reversal of stasis is of fundamental importance to clinical medicine.

Institute of Pathology, University of Oslo. LEIV KREYBERG Director.

CONCENTRATION OF DIPHTHERIA ANTITOXIN IN CORD BLOOD

SIR,—It is regrettable that Miss Barr (Sept. 24, p. 578) missed the main point of my letter of Sept. 17. My intention was not to criticise these workers' technique but to call attention to a universal biological phenomenon of which their material provided a special example.

Whatever antibodies are present in the cord blood have not been formed by the fœtus in utero, but were derived from the mother by placental filtration; in addition, only univalent antibodies can traverse the placental barrier, whereas bivalent antibodies cannot. Filtration of antibodies continues until an equilibrium is set up—namely, when the titres in maternal and cord sera are equal. It is manifestly impossible, therefore, for the cord sera titres to exceed the maternal sera titres, unless one makes the unlikely assumption that after equilibrium had been reached antenatally, the maternal antibody titre began to fall and that the reverse process of filtration of antibody from the baby to the mother lagged behind.

Whenever findings seem to conflict with an excellent theory it is a good idea to re-examine the data. Even conceding that the laboratory error does not exceed 10%, it is easy to see how a bias of considerably greater magnitude could arise. For example, if all the maternal sera are examined on one day using one animal, while all the cord sera are examined on another day and using another animal, the results would not be strictly comparable. Since the protocols are not available to me, it is of course not possible for me to state what bias if any existed in the present study.

New York. A. S. WIENER.

DANGERS OF LEAD NIPPLE-SHIELDS

SIR,—Lead nipple-shields, unfortunately, are comfortable to the nursing mother. They are pliable and fit like a cap on the nipple. Their danger is set forth in the article by Dr. Gordon and Mr. Whitehead in this issue. They are widely used and readily obtainable in chemist's shops. In London they are advocated in large maternity units, including at least one important maternity hospital. In the North of England, we are informed, sales are even larger, and in the Midlands they are recommended in a neonatal unit famous throughout the country.

The reason given for their use is that the lead assists the healing of cracked nipples; and so it does, but unfortunately this process occurs at the expense of administering lead compounds to the suckling infant at every meal. We have been told that the use of the shields is recommended only for a week or two, but even so the danger remains. On inquiry we found that mothers who like the shields do in fact take them home on discharge from hospital, and that they are able to obtain them free under the provisions of the N.H.S. Act.

The usual form of chronic lead poisoning in the infant is lead encephalopathy, and Dr. Gordon's article indicates that complete recovery of an infant from this disease is unusual. Generally the infant dies or is rendered mentally defective. It is a disturbing thought that, among the many infants one sees with fits and mental defect, one may easily have missed cases of lead encephalopathy through failure to bear in mind the possibility of lead poisoning. The use of lead compounds in industrial processes is hedged about by strict legal in order to prevent poisoning. There is, we suggest, room for doubt that the sale of lead nipple-shields be made illegal.

The Ministry of Health has issued an urgent against using these shields; and we acknowledge generous help received from two large firms stopping their sale. Plastic nipple-shields, which now on sale, might well be given a trial by th recommending the use of a shield. We appeal to doc and midwives to do all they can to abolish the us this dangerous metal in nipple-shields for nursing moth No mother would risk using them if she knew the

HELEN M. M. MACKA
London, E.2. DONALD HUNTER.

MIDWIFE AND/OR DOCTOR

SIR,—In your leading article last week you have succeeded in being entirely objective.

With regard to your comments on the moth supposedly mistaken preference for a doctor as analge surely the present-day general practitioner is chang over very rapidly to the use of the Minnitt "spec attachment" and even more rapidly to tric frequently combined with pethidine. Even, ho if he still uses chloroform there is no evidence that i practice this delays delivery as you suggest. Bourne Williams[1] state: "When chloroform was used as a rout for every delivery at Queen Charlotte's Hospital th was found to be no increase in the time of labour, unchanged forceps-rate, no greater incidence of p partum hæmorrhage, and no greater stillbirth rate."

Rightly or wrongly the midwife is not allowed to any of these aids and she realises that her own Min apparatus without attachment is already out of d and out of favour with patients who have experience other methods. What woman doctor or doctor's would deny herself one or the other? Dr. Grantly Di Read does not deny them if requested and incidenta is himself present at the confinement. How else co he have made his observations and added to the s of our knowledge?

Surely if the maternal-mortality rate for cases supe tended by the Queen's Institute of District Nursing 0·74 per 1000 births—includes those transferred general practitioners as "aid cases," the latter can have dealt with them so incompetently; yet in the nex paragraph dealing with the admitted deficiencies in th general practitioner's training you imply that Sir Eard Holland's investigation applied only to booked doctor cases. I have not the report by me, but was this so?

Surely, Sir, the answer lies in the will to cooper between midwife and doctor, the latter's part in a norm case being mainly with analgesia. But how can a doct be "available in an emergency" such as a catastroph postpartum hæmorrhage unless he is in the hou We cannot do without each other. In this area the la Dr. R. E. Moyes and his colleagues themselves estab lished the professional position of the midwives by refusing to attend a case at which a trained midw was not in attendance, and so put an end to the era the handywoman; but he did not forget the importance of the presence of the practitioner during labour; and you would do well to re-read his paper[2] to apprecia the part played by the general practitioner in improving domiciliary midwifery.

Amble, by Morpeth, Northumberland. R. P. ROBERTSON.

*** We should have made it clear that Sir Eardley Holland's investigation covered all the maternal death (100) notified in a county during three years.—ED. L.

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1. Bourne, A. W., Williams, L. H. Recent Advances in Ob and Gynæcology. London, 1945; p. 51.
2. Moyes, R. E. *Brit. med. J.* 1936, ii, 386.

y doctor with his fuller background knowledge. the patient is unable to judge between conflicting ons. It is well that the patient should have access her sources of medical opinion, but danger lies in absence of direct contact between the sources of e.

the health centre of the future it may be possible corporate the welfare and school medical services e general-practitioner organisation. and to arrange liaison between the industrial medical officer and health-centre team. Meanwhile the gaps between bricks of a good medical service must be filled in he mortar of determination to keep the other fellow the picture," and extended facilities for verbal and en contact are needed. While no mechanical means tercommunication can replace direct personal contact een the general practitioner and his colleagues. eve that an improvement in written contact might fected on the following lines.

e 7 in. by 5 in. National Health Service record lope is now practically universal. I suggest that medical units—specialist. practitioner. and local th authority—adopt a standard size of headed e-paper designed to fit unfolded into the record lope. The top edge of the sheet should be gummed the sheets made up into block pads. Such pads ld make duplicating of notes with carbon paper less: the duplicate would be posted "for information to the general practitioner, who would affix the s or reports in date order to the back of a continuation t. They would remain a permanent and useful rd, and the envelope would no longer be a swollen ainer for a jumble of reports of different size and shape. ith some such simplification of recording outside the pital as well as within, Mrs. A on her next attendance surgery might receive from her own doctor the added efit of a colleague's advice interpreted in a way she understand.

[illegible] R. J. F. H. PINSENT.

LOWANCES FOR PROFESSIONAL WITNESSES' FEES

R.—In your issue of June 4 I drew attention to iculties in connexion with the payment of fees to ried medical and dental officers for attending the minal Courts to give professional evidence.

n the final paragraph of that letter the hope was ressed that the offending paragraph of the Home ce circular (no. 189/48, dated Aug. 28, 1948). addressed clerks of assize. clerks of the peace, and clerks to the tices. would be revised. This hope has now been filled by the issue of Home Office circular no. 190/49, ted Sept. 8, 1949, which reads as follows:

"I am directed by the Secretary of State to refer to the cluding sentence of paragraph 5 of the Home Office ular of 28th August. 1948 $\frac{\text{(H.O. 189/48).}}{\text{C}}$ and to say that has been in consultation with the Minister of Health ut the payment of professional witness allowances to aried officers in the National Health Service, such as cialists and hospital doctors. who do not lose any income attendance in court. He understands that the Minister now prepared to allow salaried hospital medical and dental ff in the National Health Service to retain any fees which ay be paid to them for professional services not within e scope of the hospital and specialist services and that tendance at court as medical witnesses is regarded as professional services which are not included within the scope of e hospital and specialist services. In the circumstances e Secretary of State considers it reasonable that professional tness allowances should in future be payable to all salaried spital doctors and dentists in the National Health Service: at paragraph 5 of the Home Office circular should be ended accordingly."

ALISTAIR FRENCH
Secretary.
The Medical Protection Society.

ary House, Leicester
Square, London, W.C.2.

Obituary

ROBERT MILNE

M.D., M.S. LOND., F.R.C.S.

Mr. Milne. consulting surgeon to the London Hospital, will long be remembered with respect and liking. His surgical opinion was sound: his technique was good; and he succeeded in mastering a specialty while remaining a general surgeon. Moreover, he taught ably both by precept and example. embodying for his students much that was most valuable in their hospital's tradition.

Born in London in 1881. he was named after his father. Robert Milne. M.D.. medical director of Dr. Barnardo's Homes for some forty years. He entered the London Hospital in 1899 with a Price scholarship. and qualified in 1904. taking the London M.B.. with honours in medicine. in 1905 and the F.R.C.S. in 1906. From 1905 onwards he worked with T. H. Openshaw in the orthopædic department. and after joining the honorary staff in 1910 he spent some time in the United States. largely in Albee's clinic. On his return he was one of the first in this country to use Albee's method of spinal fixation.

Having served in the R.A.M.C. during the first world war. with the rank of major. Milne returned to the London Hospital and in 1922 succeeded Openshaw in charge of the orthopædic department. As a general surgeon. he did not follow the general trend towards separating his specialty from the rest of the hospital's surgical practice. but he was always willing to give his colleagues the benefit of his immense experience. which extended to radiological and electrical techniques. His knowledge of diseases of bone was exceptional and his opinion was in constant demand in the interpretation of difficult X-ray films. His work as surgeon to Dr. Barnardo's Homes gave him an insight into the rarer surgical diseases of childhood.

"Robert Milne." writes H. S. S.. "was essentially a London Hospital man, and only those who were his colleagues could appreciate all that he did for the hospital. for the students, and for the great branch of surgery which he made his own. He was I suppose one of the last general surgeons to make a mark in orthopædics. and although he refused to abandon the wider field it was in the surgery of bones and joints that his real metier lay. and for it he showed a rare and convincing aptitude. His plain common-sense outlook on its problems was appreciated equally by his patients and his students. many of whom look back upon his outpatient sessions as a revelation of what can be done by simple methods. His teaching was never over their heads but always went to the heart of the matter and won their confidence." "To the mere dresser." adds L. N. J.. "Bob Milne was the kindest and friendliest of chiefs. giving an impression of quiet and unassuming omniscience in his subject. One never saw him stumped. rattled. or ruffled. and his courteous and assured manner. especially with small patients and their anxious mothers, spread an air of justifiable confidence all round. Like so many Scotsmen he was full of quiet humour. And none had a sharper eye for orthopædic humbug—'operations which left the patient no better off except that he could perform some little parlour trick.' as he put it in a voice curiously and unexpectedly high-pitched for so sturdily built a man." As an examiner, he was kind. and always referred to the examinee as "Boy." His humour often lessened the tense atmosphere which surrounds the nervous candidate and helped to put him at his ease.

It is now six months since I left a registrar's post in a teaching hospital to enter general practice, and so far I have not regretted it. After qualifying in 1940, serving three years as a medical specialist in the Army at the latter end of the war, followed by two years as a registrar, and having obtained the requisite higher qualifications, one felt oneself to be in the running for specialist appointments. But advertisements for such posts have been almost non-existent over the past eighteen months, and for those vacancies which have occurred a field of fifty applicants has been by no means uncommon. The chances of obtaining the membership used to be considered small at 10 to 1 against, but what of a 50–1 chance against success! The alternative prospect of becoming a "stooge" under the grandiose title of senior hospital medical officer did not attract me, and so general practice seemed the obvious choice.

My experiences, small as they are, suggest to me that it is high time this mad rush for specialisation is checked before it ruins the profession. It is obvious that there are many more highly qualified young men holding registrar appointments than there can ever be specialist vacancies to fill, and many will have to take the plunge into general practice sooner or later.

There is still plenty of opportunity for good clinical work in general practice, despite the pessimists who maintain we spend our days filling up forms for milk, spectacles, and corsets. I find nine years of hospital practice astonishingly helpful in the treatment and nursing of pneumonias, cerebral thromboses, &c., in the home, and in the country most acute-medical conditions can be looked after at home. One finds ready coöperation with a first-class provincial hospital if the elementary courtesy of a sensible letter is observed in sending outpatients, or ringing up the appropriate department of the hospital for emergency admissions. Admittedly midwifery has been a little frightening after a lapse of nearly ten years, but excellent tuition is forthcoming from two indulgent partners. Interesting cases do not occur only in hospital but abound in general practice if one takes the trouble to look for them.

The success of a health service depends on a high standard of general practice. Of recent years there has been a tendency among the newly qualified to regard general practice as the last refuge of the destitute unable to find a niche in hospital. For this the teaching hospitals are largely to blame. Professorial chairs are all very well to encourage research and academic progress, but the presence of so many academically brilliant young men in the medical schools is a temptation to encourage the erudite and scorn the commonplace. It may be most stimulating to discuss the ætiology of pseudo-fibrillary twitchings of the pituitary but it is far more important for the student to learn how to diagnose and treat Mrs. Smith's belly-ache. I feel that if the needs of general practice were borne in mind more by those responsible for medical education—which implies that general practitioners should have a say in the syllabus—there would be far less reluctance on the part of newly qualified doctors to enter general practice, and far fewer disillusioned young men eking out a pauper's existence in a garret with starving wife and children while vainly searching the advertisement columns of THE LANCET by the light of a guttering candle for the most perfect but most elusive of all jobs, that of a hospital specialist.

Lest anyone should imagine that the life in general practice here advocated is without blemish, it would be wise to add that there are many frustrations; patients can be infuriating, and it is a dog's life for one's wife. But at least one can have the satisfaction of being a doctor in the fullest sense and not just a specialist in the function of one part of one organ.

A. S. WATTS.

Mortimer, Berks.

EXPERIMENTS ON ANIMALS

SIR,—I was much interested to read the comment Duncan Leys and D. R. Newth (Sept. 10) on the quest of experiments on children and feel that many b myself must share their ethical views. Boys of 1 cannot be regarded as of such an age as to give con or realise the full implications of an experiment. many instances in which children have been as experimental material have been recorded in medical journals. One cited in your issue of Sept. (p. 569) concerns the transmission of "rubella to by injecting subcutaneously the filtered throat from established cases; of 16 children presumed tible and injected in this way, 4 developed typical while 2 showed the characteristic leucopenia and lym adenopathy without rash."

It does not seem at all clear whether such experim involving a certain amount of risk to health in child are considered ethical by the General Medical Counci this country. In 1935 I wrote to the G.M.C. about so American experiments in the *transmission* of mumps, which "thirteen supposedly susceptible children 4 immunes had their mouths sprayed with an emul of an infected monkey parotid gland" (*Lancet*, 19 i, 504). Of these susceptibles 6 developed mild but unm takable mumps, 3 had doubtful symptoms, and remained well. I asked the G.M.C. (1) whether they wo consider these experiments justifiable, (2) whether th was any obstacle to their repetition in this country, (3) whether, in making such a test it would be consider ethically sufficient to obtain the consent of the par or guardian? The reply, dated March 8, 1935, was th the president of the council considered that "it does n fall within the province of the Council in the exercise their jurisdiction under the Medical Acts to advi registered medical practitioners on questions such those raised." So for the present the practitioner is in the dark as to whether experimentation on childr comes under the heading of "infamous conduct" not. On the other hand, we are all entitled to our o opinions on the matter.

M. BEDDOW BAYLY.

Camberley, Surrey.

SEEING THE PATIENT THROUGH

SIR,—In your issue of Sept. 17 Dr. Lipscomb h very ably drawn attention to the evils arising out lack of coördination between individuals and depa ments in hospital practice. The evils that he describ are, however, perhaps greater outside the hospital wa than they are within.

In the past the family doctor was regarded as the on source of medical advice directly available to the patie At present, besides the general practitioner, there three or more sources to which a patient may turn medical wisdom, and which may supply conflicting even contrary advice.

Mrs. A's pain starts at work, and she is referred by works' nurse to the industrial medical officer.

Mrs. A's symptoms accompany her first pregnancy, she lays them before the medical officer at the welfare cen which she attends for antenatal examination. Her pregna may go to term and an unexpected complication arise dur labour. As her own doctor is not on the obstetric list, second general practitioner, to whom she is a compl stranger, is called in by the midwife.

Mrs. A may experience her pain while shopping a remember that the hospital casualty department is just rou the corner. She can see the doctor there.

In addition Mrs. A's child may have frequent sore thro and enlarged tonsils. She has heard that the waiting-l for tonsillectomy is shorter at the school clinic than at hospital to which the child has been referred, and the ch is seen by the school medical officer.

The advice given by these different doctors, thou sincere and sound, may differ from that given by

Notes and News

CLOTHES AND PSYCHIC HEALTH

THES. said Mr. James Laver, at the opening of the session London School of Medicine for Women, on Sept. 30, never been designed for utility. Originally they were al—fertility symbols—and perhaps that was their last tion with anything even remotely connected with al health. Doctors have had as little effect on clothes alists on manners. When the S-shaped woman came in. time of the bustle, the health corset was launched; no time it had become tighter (and smarter) and less y. People, he finds, wear too many too tight clothes; ese are designed on one of three principles: the hier-al principle, emphasising class distinction, commonly in the clothes of men; the seduction principle, designed ter sexual attraction, commonly found in the clothes of n; and the utility principle, which has very little to the matter. It prevents women wearing crinolines of rds' circumference but not those of 6 yards' circumfer- it prevents men from wearing clothes which stop them ing entirely but not from wearing clothes which nearly them breathing.

men's clothes fluctuate so much that there is always a e that they will be sensible from time to time. There chance that men's clothes will ever be sensible. They ssilised. The buttons on the sleeves of his coat, he said, not been used since 1795. At the back of evening "tails" no more vestigial buttons, used in an age of horse-riding tton back the skirts of the coat; but the skirts themselves peared in 1780. The only way to change men's clothes is to bring in a new sports dress. This in time becomes ng dress, and then servants' dress, for servants wear the off dress of their masters in every sense. The 19th-ry footman wore 18th-century dress; and the evening of the 19th-century gentleman is worn by waiters in 0th. Young men now wear sports coats and grey flannel in twenty years, when this costume has got smarter—and fore tighter—it will be correct dress, and something like American lumber-jacket will be coming up on the left. en marry the men who look likeliest to support a family, correct men's dress today is designed to show that the er doesn't work with his hands. Men dress like bankers, h gives a great sense of security. Women's dress ranges gh a cycle in which modes are successively labelled tent, chic, usual, dowdy, quaint, romantic, beautiful. if the emancipation of woman has at last been achieved, permanently achieved, it may be that they will be able oose men as men, and not as symbols of security. In case all the women may wear dungarees, while the men dress as spivs.

at clothes can influence the mind as well as express it. on always put on a full court dress to write—as anyone tell, Mr. Laver said, by comparing his style with that of ac, who always wrote in a dressing-gown. There is ething to be said, he believes, for what the French call t. To treat the body alone is merely to treat symptoms: mind must be treated too. Gin may be bad for the body: if it changes a tired and disagreeable husband into a onable person it is not entirely harmful. A smart hat makes fference to a woman: and an ailing neurote has some-s been changed to a useful citizen by finding the right smaker. He urged his hearers to pay attention to this in professional lives; for if our age is to get greyer and er, then the future for women is a beige one. Most people, erneath, are desperately frightened; and he finds some-g gallant in the way the human spirit tries, with its ners and its funny little hats, to reinforce the love of life.

AN AMERICAN VIEW OF REABLEMENT

t the Royal Free Hospital, on Sept. 14, Dr. Howard Rusk. the Bellevue Hospital and the Institute of Rehabilitation. w York University, spoke of the enormous cost, in wealth and ppiness, incurred by failure to secure proper rehabilitation er industrial and other injuries and illnesses. He spoke chiefly cases of hemiplegia, spastic paraplegia, and quadriplegias, tailing the various tasks which make up the routine of patients' lives at his clinic. The tasks are set out on a m provided to each patient. As the patient finds himself le to carry out each fresh task, such as his toilet, and moving m a wheel-chair to bed and from bed to wheel-chair, the propriate blank on the form is filled in so that the patient may see his progress in pictorial form. This method has succeeded so well in promoting the competitive spirit that, with various mechanical aids, even quadriplegics have been able to return to some form of employment.

RHEUMATISM AND THE PUBLIC

THE British Rheumatic Association has lately held a two-day conference and exhibition. This association, consisting primarily of lay sufferers from rheumatic diseases, was formed two years ago to further the interests of all such sufferers in the political, social, and economic fields: its activities are correlated with the medical work of the Empire Rheumatism Council. The association's latest meeting, held in London on Sept. 27 and 28, covered a wide field. In the exhibition many bodies, such as the Chartered Society of Physiotherapy, the Association of Occupational Therapy, and the Central Council for the Care of Cripples, were represented at stalls in which the activities of these bodies in the care of the rheumatic patient were described. The spas too were represented and photographic exhibitions illustrated their work.

The conference met at two sessions. At the first Dr. W. S. C. Copeman lectured on recent advances in the treatment of rheumatoid arthritis, with particular reference to 'Cortisone.' In the subsequent discussion he had to contend with many questions from enthusiastic lay seekers after the truth. At the second session Dr. W. S. Tegner and Dr. A. B. Williamson, of Leeds, spoke on the Care of the Rural Patient. Dr. Tegner approached the topic mainly from the aspect of improvisations that can be made in the homes of rural patients who need physiotherapy, while Dr. Williamson reviewed the organisation of peripheral rural clinics. The discussion which followed revealed general agreement that the Government should be pressed to provide treatment facilities for rural patients.

The young association is finding its feet and enlarging its activities. It is bound to come more and more into touch with the medical profession; it will have to be guided wisely and carefully if it is not to fall a prey to the enthusiasm of unorthodox concepts of ætiology, pathology, and treatment. Rheumatism remains an all-embracing term, and it would be of interest to ascertain exactly what forms afflict the members of the association, who have banded themselves so hopefully together.

University of London

On Oct. 19, 20, and 21 at 5.30 P.M., at University College, Gower Street, W.C.1, Sir Paul Fildes, F.R.S., will lecture on Growth and Reproduction of Bacteria. On Tuesday, Oct. 25, at 5 P.M., at St. Mary's Hospital medical school, W.2, Prof. C. F. Schmidt (University of Pennsylvania) will speak on the Physiology and Pharmacology of the Cerebral Circulation. On Nov. 21, 22, 23, and 24 at 6 P.M., at the London School of Hygiene, Keppel Street, W.C.1, Sir James Learmonth will give four lectures on the Contribution of Surgery to Preventive Medicine.

University of Sheffield

At recent examinations the following were successful:

M.D.—Helen N. Mellanby, E. L. M. Millar.

Final Examination for M.B., Ch.B.—Daphne Burkinshaw, Nancy Cole, J. D. Crabtree, Peter Kelly, Barbara Kilpatrick, P. O. M. McGirr, Shamina Mohamedi, F. L. Myers, G. H. Pagdin, Kathleen Sampson.

University of Aberdeen

On Sept. 28 the following degrees were conferred:

M.D.—G. S. Riddell (with honours); W. F. Russell.

M.B., Ch.B.—W. I. Cranston (with honours); J. G. Henderson, G. G. Mathieson, W. W. Wilson (with commendation); B. C. Abernethy, Isobel B. Alexander, John Barron, A. A. W. Boyd, Katharine M. Brodie, Margaret M. Chrystall, Francis Clark, I. M. Cochran, William Cochran, I. A. Cook, F. T. Crossling, H. J. Crow, G. M. Davidson, Jean L. Davidson, Kathleen M. Dawson, B. W. Duthie, E. A. Fox, A. B. Fraser, D. E. Fraser, D. M. Fraser, Doreen M. M. Gove, R. B. Gove, Alexander Hird, J. D. Hunter, J. C. S. Jeffrey, Jean D. Jockel, F. F. Kinnaird, James Knowles, I. H. Lewis, Alan Lorimer, A. M. McGregor, J. A. McGregor, Yvonne M. H. McGregor, Mairi E. Macleod, D. K. McTaggart, W. G. C. Manson, A. T. Mennie, R. S. W. Middleton, Charles Miller, Frances F. Milne, G. A. W. Milner, R. W. Milner, Norman Murray, W. D. Nicholson, Helen R. Phemister, J. W. Price, P. E. Rixon, James Rose, Catherine I. M. Ross, R. G. Ross, W. A. Ross, G. S. Selbie, R. M. Sinclair, R. A. Smith, Eileen M. Spence, Doris L. Stephen, G. S. Stirling, Isobel R. S. Troup, R. G. Troup, Margaret F. Tweddle, D. C. Watler, G. L. Watt, Kathleen M. Watt, A. A. Will, G. A. Wood, Constance M. Yule, R. M. Yule.

University of Birmingham

Dr. Francis Braid has been appointed Ingleby lecturer for 1950.

Milne remained on the active staff of the London Hospital till 1943. Writing of his war service, C. P. G. W. says: "While the blitz of London was at its height he carried on his work in a fearless and unruffled manner which was a joy to behold. Though he had served in the Royal Army Medical Corps, he always had a soft spot for the Navy. He became consulting orthopædic surgeon to the Navy shortly after the commencement of the second world war and in 1942 was appointed a temporary surgeon rear-admiral, a post he filled with dignity and honour. He was always ready at a moment's notice to fly anywhere to see any urgent cases. He never spared himself. The medical branch of the Navy loved him because of his willingness to give advice and to give it in a most friendly manner. He would operate on the difficult case or help the younger man, acting invariably as the assistant. This attitude was appreciated immensely by all who sought his advice.

"Milne was a family man who loved his home and always gave a ready welcome to anyone who would drop in for a talk or a meal. It was a joy to see the family circle with Robert chipping the entire company. At the London Hospital dinner last year he was in the chair, and all those present will remember his able and stimulating speech enlivened with whimsical humour."

Our brief report of that speech deserves quotation because it reveals so much about the speaker:

> "People had the idea," he said, "that hospitals are places to which patients go for perhaps four weeks, and then pass on; to which students go for perhaps four years, and then leave forever; a place where ships pass in the night. But this was not true; a hospital was a place of continuing friendships and lasting memories—memories of chiefs who bullied you when you were a houseman and of housemen who bullied you when you were a chief. The London Hospital, for all its internal changes, still stood exactly where it did; and on emerging from Whitechapel station one could still detect the faint smell of coffee and human unwashedness described by Henry Bashford 38 years ago. The hospital's ambition was to produce a thoroughly sound doctor, to be depended on in emergency, who would do the right thing even if he didn't quite know why. It had produced great men of science, like Henry Head and Hughlings Jackson, but also men of great service like Barnardo and Grenfell. He had a faint fear that in the new system unselfishness and the spirit of service might be snowed under, but he asked his hearers to drink the hospital's health in the hope that they would continue."

Mr. Milne died at Aldeburgh on Sept. 29. Of his family of three, the elder son has qualified and the younger is a medical student. Miss M. G. Milne, the matron of St. Mary's Hospital, is his sister.

NICHOLAS KEATING

O.B.E., L.R.C.P.I.

Dr. Keating, who died at his home in Dublin on Sept. 23 was, till last year, senior member of the Silicosis Medical Board at Cardiff. After qualifying from University College, Dublin, in 1912, he held house-appointments at Chesterfield and North Derbyshire Hospital. Later he became assistant tuberculosis officer and assistant school medical officer for Sheffield till in 1930 he joined the silicosis board. He took part in two special investigations—one on the incidence of silicosis in granite-workers and the other on the incidence of pneumoconiosis in coal-trimmers in ships—and he was also a member of the advisory committee on the treatment and rehabilitation of coalminers which sat in 1943. Last year he was appointed O.B.E. for his services. He retired a year ago because he felt he was blocking the way for promotion of younger men.

A colleague adds: "Keating was well known to doctors in South Wales, whose patients applied to the board for compensation for pneumoconiosis. Although somewhat diffident in advertising his ability he had a reputation as a sound diagnostician. An easy and pleasant colleague to work with, he was as interested in the pneumoconiotic as in pneumoconiosis, and Welsh miners everywhere testify to his humanity."

Diary of the Week

OCT. 9 TO 15

Monday, 10th

UNIVERSITY OF LONDON
5.15 P.M. (University College, Gower Street, W.C.1) J. Z. Young, F.R.S.: Structure of Peripheral Nerve. of two lectures.)

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.45 P.M. Mr. L. E. C. Norbury: The Sigmoidoscope. dential address.)

NATIONAL HOSPITAL, Queen Square, W.C.1
5 P.M. (Institute of Neurology.) Dr. Foster Kennedy York): Allergic Manifestations in the Nervous Syst

Tuesday, 11th

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. I. Muen [illegible] Skin.)

INSTITUTE OF OBSTETR [illegible]
3 P.M. (Postgraduat [illegible] ondon, Ducane W.12.) Dr. [illegible] ckson: Problem Infertility in [illegible]

Wednesday, 12th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, Anne Street, W.1
2.30 P.M. Prof. R. W. Johnstone: Scotland's Contributi Progress of Midwifery in the Eighteenth and Early teenth Centuries. (William Meredith Fletcher lecture.)

UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. W. O. G. Tay Control of Clotting in Ophthalmology.

Thursday, 13th

NATIONAL HOSPITAL
5 P.M. (Institute of Neurology.) Prof. G. H. Monrad-Kro Diagnostic Errors in Neurological Practice.

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. G. B. Mitchell-Heggs: Skin Affections of the Ha and Feet.

WESTMINSTER HOSPITAL SCHOOL OF MEDICINE, Horseferry R S.W.1
5.30 P.M. (Meyerstein theatre.) Clinicopathological de stration on Leukæmia and its Treatment.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Desmond Curran: Psychiatry lecture demonst tion.

ADLERIAN SOCIETY OF GREAT BRITAIN
8 P.M. *Medical Section.* (11, Chandos Street, W.1.) Neville Murray, Dr. Joshua Bierer: Prolonged Snee as a Psychosomatic Symptom.

Saturday, 15th

YORK MEDICAL SOCIETY, 17, Stonegate, York
8.30 P.M. Prof. Robert Cruickshank: Diagnosis and Prevent of Whooping-cough.

NUTRITION SOCIETY
1.15 P.M. [illegible] macology, University of Birmi ham [illegible] Dr. J. Elkes, Dr. J. M. Fre Prof [illegible] P. Kiaut: Triglyceride Fat Human Nutrition.

Births, Marriages, and Deaths

BIRTHS

CRITCHLEY.—On Sept. 30, in London, the wife of Dr. J. Critchley—a son.

CRUICKSHANK.—On Sept. 25, the wife of Lieut.-Colonel J. [illegible] .C.—a daughter.

[illegible] the wife of Dr. I. H. Gosset—a son.

[illegible] 23, at Reading, the wife of Dr. R [illegible] *Hargrove—a daughter.*

HAWKINS.—On Sept. 30, in Birmingham, the wife of Dr. Cli Hawkins—a daughter.

HOOD.—On Sept. 26, the wife of Dr. Ronald Hood—a son.

MACKENZIE.—On Sept. 24, the wife of Dr. E. H. MacKenzie—a s

MARSHALL.—On Sept. 28, at Wolverhampton, the wife of Dr. A Marshall—a son.

NASH.—At Ladysmith, Natal, the wife of Dr. R. W. Nash—a

NEAL.—On Sept. 26, in London, the wife of Major J. B. N R.A.M.C.—a son.

SALEH.—On Sept. 28, in Manchester, the wife of Dr. A. H. S —a son.

MARRIAGES

BINNS—WHITAKER.—On Sept. 17, at Ewell, Surrey, Geo Augustus Binns, M.R.C.S., surgeon lieut.-commander, to Joan Whitaker.

BREARLEY—HEWITT.—On Sept. 8, at Sandiway, Cheshire, Ro Brearley, M.B., to Joyce Mary Hewitt.

GARDNER—HARROWER.—On Sept. 29, in Edinburgh, Da Lindsay Gardner, M.B., to Helen Margaret Harrower.

RIGG—WALLACE.—On Sept. 29, in Glasgow, Charles Dick R M.B., to Vera Shaw Wallace, M.A.

WALTER—KELLY.—On Sept. 8, in Belfast, Major Roger P. Walter to Nora Kelly, M.B.

WEBBER—HAY.—On Sept. 28, at March, George Edward Fr Webber to Hilda Russell Hay, M.B.

DEATHS

FREEMAN.—On Sept. 29, Harry Freeman, F.R.C.S.

HOFFMAN.—On Sept. 26, at Cranham, Glos, Geoffrey Art Hoffman, B.A., M.B. Dubl.

JOHNS.—On Sept. 27, at Adderbury, Archibald Tisdall Johns, M.D. Dubl., aged 77.

MILNE.—On Sept. 29, at Aldeburgh, Suffolk, Robert Milne, M.S. Lond., F.R.C.S.

OME INTERPERSONAL FACTORS IN ILLNESS

F. R. C. CASSON
M.B. Lond., D.P.M.
IAL ASSISTANT IN DEPARTMENT OF PSYCHIATRY, NATIONAL HOSPITAL, QUEEN SQUARE, LONDON

E purpose of this paper is to draw attention to certain iological reactions which occur between the sick n and his human environment. Some of these are obvious, others more obscure, but nearly all are iciently recognised.

in all reactions, physical or psychological, both gents" are affected and mutually interactive. The nt's human environment, moreover, is composed number of persons—such as doctor, nurse, relatives, ellow patients—all of whom may react not only on but upon each other in relation to him. For sim- y's sake, the members of this environment will be dered as being isolated from one another but paired the patient, one by one, in a series of equations een the terms of which we must visualise the ⇌.

e practical effects of the various reactions are of more rtance to the patient, for they affect his recovery ven his survival; so his side of the equation will in case be considered first.

REGRESSION

illness, various degrees of regression to the depen- e and inadequacy of childhood take place. Sick le tend, physically, to be weak, unable to look after selves, needing to be nursed in bed, fed, and washed thers; mentally, they show the egoism of a child, "childishly" demanding, live very much in the ent, and are uninterested in their surroundings pt in relation to their own needs. As Hazlitt says, other things but our disorder and its cure seem less nothing and vanity."

his childish status is implied in the way the patient ually treated. He is subjected, especially in hospital, ll sorts of petty rules and restrictions; his general vities, his diet, sleep, and habits are supervised; loctor, in most cases, does not tell him what is wrong t him; his nurse bosses him about or insists on g everything for him; his relatives take over his onsibilities.

PATIENT ⇌ DOCTOR

"All patients, when ill, regress in some degree to infantile titudes, placing the physician in the position of parent nurse, from whom the utmost of care is demanded, t whom, on the other hand, it is very amusing to trick annoy" (Dunbar 1943).

he doctor, as the person who assumes responsibility the patient's cure, steps into a parental rôle, usually t of the father, and is unconsciously regarded as such the patient. The emotions felt by the patient for his father may be highly ambivalent, in which case doctor is regarded on the one hand with admiration, st, and affection, as a good omnipotent father who heal him, and on the other with fear and hatred, as ad punitive father who will castrate or kill. These ings derive from the Œdipus situation, and will vary their quality and intensity according to how far the ent has solved his original Œdipus problems in past.

he positive feelings towards the doctor have long been ognised, and are gratefully accepted and exploited gitimately so) by every doctor. The negative ones are s obvious. The patient tends to repress them because their original relevance; they are unwelcome to the ctor, who may therefore ignore them or ascribe them the whims and caprices of the invalid.

That the idea of the doctor as a malevolent figure is widespread may be inferred from the awe in which many primitive tribes hold their witch-doctor or medicine-man, and from the frequent occurrence of this theme in fiction and the fantasy-world of the cinema. In the classical instance of Dr. Jekyll and Mr. Hyde the two aspects of the doctor are combined in one person; and in Dr. Moreau, Dr. Mabuse, and many Boris Karloff rôles the doctor is represented as a mad, crafty, and criminal type.

Common parlance betrays the persistence of this idea; we still speak of food or drink as being "doctored" when we mean poisoned or tampered with, and a castrated tom cat is referred to as being "doctored." Among the working-class, it is not uncommon for children to be quietened by the threat: "I'll fetch the doctor to you!" and the belief that doctors only "experiment" upon their hospital patients is often voiced. Among all classes, the physician is accused of letting his patients die, the psychiatrist of hypnotising them, and the surgeon of cutting them up.

The surgeon naturally becomes the object of negative feelings more easily than other doctors, for he usually cuts or removes parts of the body and can therefore be viewed as *causing* pain by his procedures. His contact with the patient may also be too brief or urgent to enable positive feelings to be built up. He is usually less interested in his patients as individuals than is the physician, partly because his interest and skill lie to a large extent in technique, and also because much of his work is repetitive and impersonal—tonsillectomies, appendicectomies, herniotomies—and mainly of interest to him *en masse* or statistically. He would do well to remember that to the individual patient statistics mean nothing, save in so far as they serve to reassure him about his chances of benefiting from a particular operation, and that hardly any operation is classified as "minor" by the person undergoing it. John Smith's tonsillectomy is, to him, not only a major operation but a unique one.

Ambivalent feelings are also shown by an exaggerated belief in doctors, which credits them with almost superhuman knowledge and skill, coexisting with contempt and resentment for their failure to cure various illnesses; cancer and the common cold are familiar instances quoted by the layman. The unconscious inference is that since the doctor *can* cure anything, his not doing so is proof of his malevolence. This line of emotional reasoning reminds one of primitive peoples who invest their medicine-man with supernatural powers—such as the power to make rain—and indignantly depose or slay him when he fails to avert a drought, and of those "rationalists" who reject belief in God because He "allows" human suffering and war.

Any institution or individual possessing power or knowledge above the average (such as the Government, lawyers, scientists, "experts," and so forth) is liable to become the object of such ambivalence, but the doctor even more so, because he is concerned with persons who are ill and therefore more prone to be influenced by infantile modes of thought.

In this infantile situation, the patient may regard illness in two ways: first, as a threat to survival, to be combated with all his life-instincts, with the doctor as an ally; secondly, as a solution of, or means of escape from, life's problems, even to the point of actually dying. From this latter point of view the doctor is a stern unwelcome mentor who tries to make the patient abandon the "easy way out" and urges him to take up the burden of responsibility once more. From this point of view, too, the patient may gain his ends if he lives to "enjoy ill health," or has perpetual recurrences of his complaint (note the complacent way in which he will say "My chest has *always* been my weak spot, doctor!"), or dies without adequate physical pathological cause.

Society for the Study of Addiction

Prof. F. L. Golla will give his presidential address to this society on Tuesday, Oct. 18, at 4 P.M., at 11, Chandos Street, London, W.1. He is to speak on Problems for Research in *the Study of Addiction.*

B.C.G. Vaccine for Britain

A consignment of B.C.G. vaccine from Copenhagen reached London by air last Monday. Part went to the Children's Hospital, Sheffield, for vaccination of volunteers among the staff.

Manufacture of Streptomycin

Streptomycin can now be manufactured for sale in the United Kingdom only under licence, and it must conform with prescribed conditions as to strength, quality, and purity. These requirements are laid down in the Therapeutic Substances Amendment Regulations, 1949, under which streptomycin is added to the schedule to the Therapeutic Substances Act, 1925, as being a substance the purity or potency of which cannot be adequately tested by chemical means.

National Hospital, Queen Square, London

Today, Friday, Oct. 7, Dr. Wilder Penfield, F.R.S., director of the Montreal Neurological Institute, will speak on Observations on the Anatomy of Memory. On Monday, Oct. 10, Dr. Foster Kennedy (New York) will speak on Allergic Manifestations in the Nervous System, and on Thursday, Oct. 13, Prof. G. H. Monrad-Krohn (Oslo) on Diagnostic Errors in Neurological Practice. All three lectures will be held in the institute of neurology at the hospital at 5 P.M.

British Trust for Social Studies

This trust, to encourage social research of scientific and practical importance, offers small grants to free-lance investigators who are well placed for social observation but who would have to work up the material in their spare time: for example, a colliery manager, a probation officer, a hospital almoner, a shop steward, the warden of a hostel, the editor of a local newspaper. Application forms may be obtained, by post only, from Miss Marion Nuttall, secretary of the trust, 16, Queen Anne's Gate, London, S.W.1.

Middlesex Hospital Dinner

Presiding over the annual dinner of the Middlesex Hospital Medical School on Sept. 30, Prof. E. C. Dodds, F.R.S., spoke with deep regret of the recent death of Mr. Turner Warwick at the height of his influence in the hospital. He described the school as the most remarkable in London, because the founders had tried to keep the students' education on scientific lines as broad as possible. The tradition founded by Bell had been continued by Bland-Sutton (who indicated that Middlesex should be a school of research besides being a school for training doctors) and by Webb-Johnson; and he himself was eternally grateful that, with his colleagues, he had been allowed to develop the Courtauld Institute of Biochemistry without any apparent tie-up with medicine. Professor Dodds also spoke wistfully of the good old days when there was no limit to the number of times one could take the 1st, 2nd, or final M.B., and when discerning parents, for a composition fee of £150, could cover their sons' tuition for as many years as might be necessary. After his tenth year the senior student had become quite an important person; and the 1916 entry, to which Professor Dodds belonged, was distinguished in having contained probably the most senior student of all time, who retained his status till 1935.

Dr. H. E. A. Boldero, the dean, said that the past year, though it had seen the birth of the National Health Service and the separation of school from hospital under a new charter, had been satisfactorily uneventful. He paid warm tributes, of different kinds, to Prof. John Kirk, retiring from the chair of anatomy; to Mr. R. A. Foley, succeeded as secretary of the school by Miss Eileen Walton; and to Dr. William Sladen, decorated for his courage and fortitude in hazardous circumstances when isolated in Graham Land as medical officer to the Falkland Islands Dependencies survey. Dr. R. T. Turner Warwick, senior Broderip scholar, spoke of sporting events rather than the traditional complaints. Dr. G. E. Beaumont, proposing The Chairman, said that Professor Dodds owed his success to a curious combination of concentration and contemplation, which had enabled him, for example, to discover the new star Stilbœstrol. The Medical Research Council had been able to point to stilbœstrol as justifying all the money they had spent on medical research: and at one time it had even been hoped that it would close the dollar gap.

North of England Otolaryngological Society

The annual meeting of this society will be held Harrogate and District General Hospital, K[illegible] Road, Harrogate, on Saturday, Oct. 15, at 2 P.M.

General Board of Control for Scotland

The Secretary of State for Scotland has appoint Catherine Begg to be a deputy commissioner of the Dr. Begg, who graduated M.B. at Glasgow University is at present senior medical officer at Stoneyetts *Hospital, Chryston, Glasgow.*

Welsh National School of Medicine

Dr. F. R. G. Heaf has been appointed to the [illegible] professorship of tuberculosis.

Dr. Heaf took the Conjoint qualification from St. T Hospital in 1918, and, after holding various house- there, his M.B.Lond. two years later. His earlier pape Trachea in Tuberculosis and on Sanocrysin Treatment monary Tuberculosis reflect his interests during the of his career [illegible] Sanatorium, [illegible] Last year he [illegible] *in Respiratory Tuberculosis* and [illegible] o Papworth Village Sett [illegible] honorary consulting medical [illegible] With his appointment to the [illegible] ith the London County [illegible] adviser in tuberculosis to the Ministry of Health, the focu [illegible] and his later papers de [illegible] ous and with social asp [illegible] of the Tuberculosis As [illegible] *Education* Institute.

King's College Hospital Dinner

At the annual dinner on Oct. 1, Dr. Wilfrid Oakley pr the Medical School, which, he said, had always done to give students clinical experience, which was not th thing as the shifting dullness of the ward round. The had a certain touch of unconventionality, and liberty very spirit of progress. Mr. Harold Edwards, the said that last year some 900 students applied for 50 The final selection was made by personal intervie though it was distressing to reject the son or daug an old King's man, he felt sure that all would prefe children to get their place in the same way as anyo Negotiations were continuing hopefully for acqui additional hospital beds absolutely necessary for the d ment of the school. Dr. Sydney Thomson said that and hospital were living very happily together, officially living in sin. Sir Hugh Cairns had found at fine students, a happy atmosphere, and the faint t arrogance which he considered healthy and "which sure endears you to all the other London schools." He that in the National Health Service doctors would ta to guard their professional freedom—to be outspoke he thought that all should fight to preserve the pos the general practitioner, to which perhaps not enough tion had been paid so far. Dr. Terence East proposi health of The Chairman, Dr. J. H. Sheldon of W hampton, referred to his inquiries into bone diseases, a nervosa, hæmochromatosis, and latterly old age, and his naval service, his mountaineering, his cycling, a ornithology. Dr. Sheldon, in reply, remarked that had early discovered that in times of financial str exports were the thing to go for. He had exported hi Wolverhampton, and he strongly believed that this of export from London should continue.

Colonel M. Stoddart-Scott, M.P., has been elected ch of the British Rheumatic Association in succession to Dr. F. Hernaman-Johnson.

CORRIGENDUM: *Vitamin E.*—In line 6 of Dr. F letter of Sept. 24 *(p. 579)* the amount of ergotamine should have been printed as 50 mg., not as 5 mg.

Appointments

DOB [illegible] pathologist (deput [illegible] Wight pathological [illegible] consultant bacter

MAC [illegible] y, Epsom.

ROL [illegible] consultant an [illegible] tal management co [illegible] groups.

SHARP, WILLIAM, M.B. Leeds, D.P.M.: consultant physic mental deficiency, western part of East Anglian hospita

Runwell Hospital, Essex:

TOW, P. M., M.B. Lond.: clinical research fellow.

VALENTINE, M. G., M.D. Aberd. [illegible] senior registrar.

ity to make the nurse feel herself part of an active espondent team. It is probable, however, that some es unconsciously resent having to spend their lives ng for other people's old folk when, by their ession, they have freed themselves from economic endence upon their own parents and are possibly ributing to their upkeep.

PATIENT ⇌ PATIENT

his relationship hardly arises in patients treated in r own homes, in the private wards of hospitals or ing-homes, or in consulting-rooms, but in those ted in general hospital wards or outpatient depart-ts it deserves consideration.

group of patients in a ward under the care of the same tors and nurses, or attending the same outpatient ic, reproduces the emotional situations in a family hildren. Just as children compete among themselves parental affection, so do patients for the attention of tor or nurse. There is jealousy for "sister's pet" or the patient with whom the ward doctor spends more e. There are rivalries and resentments, not always onal: the patient who coughs or groans all night nderstandably somewhat unpopular, but the noisy valescent is more keenly resented, because he is also ied.

ivalry in getting better is a real and helpful factor, parable to children's rivalry in growing up. The valescent "up-patient" in a ward has a sense of sure, very often, in doing things for his fellow ients for he can thus feel himself identified with the ing parent figures of the therapeutic team and at the e time show himself superior and good to the other ients, like an older child caring for the younger ones.

entification with other patients plays a very impor-t part in ward or clinic morale; it is usually based on ering from the same illness, but other factors such age and educational or social status come into play. en patients with the same complaint get together y voice their anxieties far more freely than they do the doctor; if they learn that a fellow patient has an operation or investigation which they expect to ergo themselves they eagerly cross-question him for the details of the experience. They obviously derive ch more reassurance from somebody of the same lay us who has "been through it himself" than they from the sometimes perfunctory reassurance of the tor.

lass or group therapy for patients with organic ease has been favourably reported on (Pratt 1908, 2, Buck 1937, Chappell et al. 1937). With an ormed medical chairman such groups may well derive efit from inter-sibling identifications and parental roval simultaneously.

f one listens to the conversations of patients together, is possible to notice a difference between those of ple with the same illness and those of people with similar illnesses. In the former, much more interest hown by the listener, who is given an attentive hearing return; in the latter, each party to the conversation ms only to be listening for a break in the other's nologue to talk of his own symptoms, and the com-nts of the listener show much less sympathy or insight.

The advantages of nursing similar cases in the same rd and of retaining the usual haphazard assortment at occurs in most medical wards have not, so far as I ow, been compared from this point of view. It may be ught that patients all suffering from the same serious ess would become depressed if nursed together, but s does not seem to happen in tuberculosis sanatoria.

The tendency of birds of a feather to flock together ay be of some use diagnostically in patients suffering m mental disorders. In wards filled with a mixed population of neurotic and psychopathic soldiers, I found that the psychopaths tended either to remain solitary or to "gang up" in fairly large but unstable groups, while the neurotics usually went about in twos and threes. A colleague who works in an observation unit has remarked to me on the tendency of patients suffering from organic psychoses, and of psychopaths, to seek out any of their fellows admitted to the unit.

PATIENT ⇌ FAMILY

Even the healthy person is apt to behave in a childish and uninhibited manner when at home; and the full extent of the sick person's psychological regression is most clearly seen in his home setting. The well-adjusted man will feel concern about his enforced inactivity in so far as it throws an additional burden upon his family and prevents him from giving his usual support, but this will largely reinforce his determination to get well quickly. The obsessional or depressed person may worry unduly about the trouble he is causing, and may become severely depressed, even suicidal, for his inactivity deprives him of his usual defensive behaviour in the shape of over-conscientiousness or unremitting work.

It is generally realised that the element of "secondary gain" to the patient arises in functional illness, but an organic illness affords him similar opportunities. The neurotic or immature person will exploit his illness, more or less unconsciously, to secure a larger share of love and attention from parents, spouse, or children, to return to a state of infantile dependence, to dominate the family, to revenge past neglect, real or imaginary, and to escape various responsibilities. It is for instance a common excuse of neurotic patients, when asked why they have no family after several years of marriage, to reply that they are waiting until they feel well themselves. In other cases the same reluctance is expressed in the form of impotence or frigidity, by the asthma of the married woman which comes on at night and prevents marital relations, or the hyperemesis gravidarum that results in termination of the unwanted pregnancy.

Illnesses which "run in the family" are no doubt often due to genetic, infective, and environmental factors, but the patient's identification with someone in the family, or with a friend or workmate, may play a decisive rôle; Dunbar (1943) has drawn attention to the importance of this "exposure to illness" in the case of psychosomatic disorders.

A young soldier who complained of attacks of dyspnœa and pain in the chest and who thought he was getting "asthma" gave a vague family history of "heart trouble." Detailed discussion of the death of his favourite brother (regarding which he had severe feelings of guilt, ostensibly attributed to some minor negligence) revealed that this brother had complained of similar symptoms just before his death; and the realisation of this produced an immediate improvement.

FAMILY ⇌ PATIENT

The sick man's family usually have mixed feelings towards him. Love, pity, and solicitude will be more in evidence, owing to their social acceptability; they will often be exaggerated when there is a good deal of underlying hostility or resentment to cover up, or when there is a desire to dominate the patient and keep him in a dependent status. When hostile feelings are permitted expression it is usually in some such phrase as "Well, she never *would* eat proper meals," "He doesn't seem to do all he might to help himself," or in remarks of the "He-never-would-take-*my*-advice" variety.

Resentment may be displaced on to the doctor, hospital, employer, or Service, the relatives accusing them of having caused or having failed to cure the illness. In ex-Service cases, they often complain that the patient should never have been called up, should have been treated with more consideration, should have been dis-

The advantage to a patient of having positive feelings for his doctor is indubitably great. One of the lessons of history is that most men dislike responsibility, even when healthy: it is still less welcome to the sick. The patient's most acute need is for someone who will take the load off his shoulders, and in this regard the greater his faith in his doctor the better. To disabuse a man of excessive faith in his doctor is seldom right and almost never beneficial unless he is to change to another doctor forthwith. To believe that a good "father-figure" is looking after him is of the greatest help to the sick man; he is able to feel "good" because he can "love" the doctor, and he is further reassured of his own goodness because he feels that the doctor "loves" him. In this way he can emulate the small boy who has grown successfully through the Œdipus situation to love and be loved by his father, and with him as guide and example go forward into manhood.

DOCTOR ⇌ PATIENT

In handling the patient, many doctors rely on the maxim "Nothing succeeds like success," but the obverse of this is "Failure is fatal." The doctor must decide whether he shall tacitly accept the rôle of omnipotence for which he is cast by the patient, or endeavour to be plain and straightforward. He will probably be wise to accept his patient's confidence, remind himself constantly that it is somewhat exaggerated, and at the same time buttress it by explaining as far as possible what he is doing; by the latter procedure he will, incidentally, safeguard himself to some extent when things go wrong.

For a patient with decided negative feelings towards him, the best of doctors may be able to do nothing. Probably he can best deal with such a patient by his acceptance of the possibility of such feelings; for if he is alive to their presence he will be able to devote more effort to reassuring the patient, making him feel that his case is being given due consideration, and endeavouring to encourage positive feelings. To tolerate the patient's hostility—disguised and rationalised as it may be in various ways, such as disobedience to orders about diet, forgetfulness about taking medicine or keeping appointments, and excessive querulousness—and to make the patient realise that he has a doctor who can tolerate all this may well be the most effective form of reassurance.

The value to the doctor of his patients is not sufficiently realised. The average doctor (as distinct from the more commercially minded, and those who have found their niche in medicine in one of its more impersonal fields, such as pathology or bacteriology) finds a large part of his reward in a sense of beneficent power in being useful to his fellow men. If his personal life is unsatisfactory he may tend to treat his patients as his children or younger brothers, try to influence them unduly, fuss over them, and over-protect them, with the risk of eventually becoming embittered when they resent his authority and neglect his advice. He may also condemn in his patients what his conscience does not allow in himself, and this moral severity may cloak itself as professional solicitude. For instance, the doctor may forbid alcohol or tobacco, restrict diet, or prescribe painful treatments or unpleasant medicines to a degree not warranted by the patient's condition, withal in perfect good faith.

The doctor who is anxious or obsessional may become unduly perfectionistic and wear himself out with overwork in the service of his patients. I remember acting as locum tenens for a general practitioner who was so anxious about all his patients that he hovered around the practice, delaying his family from starting on their holidays, for three days.

Reluctance to admit to himself that his patient can do without him leads many a doctor to be over-protective and to prolong the period of the patient's dependence upon him. The psychiatrist is one of the worst in this respect. Admittedly there are those will never be able to stand alone, but many encouraged or allowed to become perennial of the "supportive clinic." Follow-up clinics sorts, which keep the patient more or less under the wing of the hospital, are not immune same disadvantage.

PATIENT ⇌ NURSE

The patient's feelings towards the nurse are akin to those felt for a mother or sister, and vary a deal between male and female patients. Women are usually more critical, demanding, and the nurse's authority, though some men will the nurse their resentment of a domineering or possessive mother or wife. Overt sexual feelings their nurses by men patients are fairly convalescence, but in the severer stages of illness, the accompanying psychological regression, ings are in abeyance, or have regressed to the love-object, the patient's own body. Moreover, nurse's rôle as a mother-surrogate, who tends the man more or less as his mother did when he was an in desexualises his conscious feelings towards her, an therefore thinks of her as a sexless angel.

Adolescent girls may develop a crush on the when convalescent, but for most women patien sense of identification with the nurse is more impor based on earlier identification with their mothers. are ready to accept unquestioningly her pronouncem on medical matters, especially those connected obstetrics or the rearing of children. Certain man turers of infant foods and gripe-water have recog this fact, illustrating their advertisements with picture of a motherly looking nurse.

NURSE ⇌ PATIENT

It is generally recognised that the nurse finds an for her "maternal feelings" in caring for the sick; is probably a true enough approximation, though undoubted pleasure that many male nurses derive similar work shows that tender protective feelings not the monopoly of one sex. These feelings have origin in the nurse's unconscious identification wit or her own mother, or ideal mother image, on the hand, and with the patient on the other, so that loo after the patient as she would have wished her fant perfect mother to look after her becomes a so valuable form of self-gratification. Just as a m may indulge her maternal feelings at the expense o child's independence, so a nurse may unwisely spoi over-protect her patient. The good nurse const encourages him, so far as his physical condition per to regain his self-reliance, and, in both senses o phrase, to stand on his own feet as soon as possib

It is noticeable that most nurses prefer what one call the material services, such as bed-making, banda giving medicines, and generally "making the pa comfortable" physically, to the intangible but eq important service of talking in a cheerful and reass manner to their charges. In a military hospital fo treatment of neurotic soldiers where I worked, it difficult at first for the nursing officers to grasp how could help in the treatment of patients who were m up and about. To begin with they could find littl do beyond checking the ward stores and serving m but as they gained insight and interest they bec invaluable helpers.

Nurses are often unwilling to work in chronic w for the aged sick. Realising that these old patients sel make a lasting recovery, they become discouraged feel that their labours are in vain. Such an atti reflects on the keen [illegible] of the medical staff and on t s was as follows: over nine years, 4 cases; over t years, 10 cases; over seven years, 14 cases; over years. 21 cases: over five years. 33 cases; over four s, 51 cases; over three years, 70 cases; over two s, 91 cases; and over one and a half years, 104 s.

ight patients died within eighteen months of their examination.

hese results will not surprise any surgeon who has wed the progress of patients treated by perurethral tatic resection. In the modern forms of this operation e quantities of tissue are removed and the surgeon to resect the entire hypertrophied portion. He is kely to succeed in doing so except in a very few s. Yet recurrent obstruction is uncommon. I wed up 273 cases of benign hypertrophy of the dular type treated in this way. Regrowth of gn tissue or development of malignant disease of prostate caused recurrent obstruction in 13 cases. 260 cases where obstruction had not occurred ite the almost certain presence of hypertrophied tatic tissue were followed up for the following ods: over ten years, 9 cases; over nine years, 20 s; over eight years, 29 cases; over seven years, cases; over six years, 69 cases; over five years, 91 s: over four years, 117 cases; over three years, cases; over two years, 206 cases: over one year, cases; and less than one year, 21 cases.

here is no theoretical reason why prostatic obstruction uld be invariably progressive. Its cause is believed to disorder of involution. Normal involution is a process imited duration, and it is reasonable to suppose that ormal involution will be likewise. Also prostatic truction is related to the form and not to the size the gland; increase in size does not necessarily mean rease in obstruction.

DEATHS

f the 129 patients treated expectantly, 18 died. e causes of death, as given by their doctors, were: tour of lung (3), carcinoma of stomach (2), cerebral morrhage (2), cardiovascular disease (2), cardiac ure (2), coronary thrombosis (2). pneumonia (2), eral senile changes (1), malignant disease of testicle and uræmia (1). The patient who died of uræmia aged 91, and with the possible exception of this case s unlikely that the prostate was responsible for any these deaths. However, the possibility that the state played a contributory part must be considered. e figures after the questionary of November, 1947, re submitted to Dr. R. A. Robb, lecturer in statistics the University of Glasgow. I asked for a comparison tween the rate of survival in these cases and the pected rate of survival of men of the same ages followed ing the same periods. Dr. Robb found "no significant ference between observed and standard probabilities surviving." It may therefore be assumed that the sence of prostatic enlargement did not affect the ation of the lives of these patients.

PROGRESSIVE CASES

n the group of 129 cases, 17 have been operated on ter a period of expectant treatment; 4 of these onged to the group of 15 in which expectant treatment as advised because of special circumstances despite e fact that the case did not conform to the general ndards adopted. In these 4 patients operation was vised because of persistence or recurrence of symptoms. wo of them had had acute retention. and repeated tacks occurred. One very frail patient had extreme iculty in micturition, requiring a very long time to pty the bladder; expectant treatment was advised ause symptoms appeared to be decreasing. but after some months they became more severe and operation was advised. The fourth patient had a residual urine of 6 oz. at his first visit, but he was obviously a very nervous man, and the accuracy of this estimation was doubted; he was seen at intervals for about a year, and similar quantities were found on several occasions; operation was advised.

PROGRESSIVE CASES

Case no.	Age (yr.)	Degree of enlargement	Difficulty	Hesitancy	Frequency (day/night)	Hæmaturia
1	57	Slight	Moderate	Not recorded	Variable. Sometimes extreme	None
2	56	Gross	None	Slight	3–4 hrly. 0–1 times	Present
3	55	Moderate	Moderate	Moderate	2 hrly. 1–6 times	Present
4	55	Moderate	Moderate	None	4 hrly. 1–2 times	None
5	58	Considerable	Slight	Slight	2–3 hrly. 3–4 times	None
6	60	Considerable	Slight	Slight	2 hrly. 3–4 times	None
7	55	Considerable	Moderate	Moderate	1½ hrly. 1–2 times	None
8	56	Moderate	Moderate	Moderate	3–4 hrly. Twice	None
9	66	Slight	Slight	None	2 hrly. Once	Present

Of the 114 patients whose clinical condition conformed to the general standard adopted, I operated on 9. In 1 of these the indication was gross hæmorrhage, and there was no indication of increasing obstruction during six and a half years. In the remaining 8 patients obstruction had increased, and these may be described as progressive cases. Of the 4 patients treated by other surgeons, 1 is known to have had increasing obstruction and may also be called a progressive case. These 9 progressive cases are worthy of special study in an endeavour to identify common clinical features. The accompanying table gives some details about these patients at the time of their first examination.

AGE

The ages of the entire series were as follows: under 40, 1 case; 41–50, 5 cases; 51–60, 45 cases; 61–70, 55 cases; 71–80, 20 cases; 81–90, 2 cases; and over 90, 1 case.

Of 78 patients over the age of 60 only 1 showed definite evidence of increasing obstruction. Benign prostatic enlargement is believed to be a disorder of involution. Moore (1936), who studied the normal involution, states: "It would appear that the involution proceeds with greater rapidity during the fifth and sixth decades and that after 60 years the changes are less striking and the velocity greatly decreased." Moore (1943) has also studied benign hypertrophy and formed the opinion that "the ætiological agent is present during presenility and senility but is most active during presenility." This view is strongly supported by the present investigation.

SIZE OF THE GLAND

The enlargement was recorded as slight in 15 cases, moderate in 75 cases, considerable in 32 cases, and gross in 7 cases. The common feature of these cases was the mild degree of obstruction, though all degrees of enlargement were found. It has long been known that obstruction is related to the form and not to the size of the gland. The table shows that size is not even important in the assessment of prognosis. Two of the patients with the largest prostates in the series have been followed for about eight and a half years. Their symptoms remain mild. and recent estimations of residual urine showed an ounce in one case and less than an ounce in the other.

charged from the Service sooner, and should have been given a pension, or a larger pension. These complaints are usually voiced as being motivated solely by concern for the patient's well-being, but the underlying resentment of him, viewed as an investment which not only is paying no dividends but is entailing a loss, is often betrayed by the remark that *they* cannot afford to keep him.

Factors such as economic difficulty, the inconvenience and labour involved in housing and nursing the patient at home, or making long tedious journeys to visit him in hospital cause a natural resentment of his demands. Also his family are often hurt by his ingratitude or petulance, and may use these to justify their own lack of sympathy towards him. On the other hand, he may become the object of coddling and over-solicitude on the part of mother or spouse or other members of his family, and if he has an undue tendency to regress to infantile dependence this oversympathetic atmosphere will encourage it.

SUMMARY

1. The sick person shows psychological regression in greater or less degree.
2. His reactions to doctor, nurse, fellow patients, and family are largely due to unconscious factors derived from early life.
3. The effects of these unconscious factors, and of his regression, on the relations between him and the people in his immediate environment are discussed as a series of reciprocal interactions.

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EXPECTANT TREATMENT OF BENIGN PROSTATIC ENLARGEMENT

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Some surgeons perform prostatectomy on all patients referred to them with prostatic enlargement and urinary symptoms, their aim being to eliminate so far as possible the advanced "bad risk" case. On the other hand, some general practitioners do not refer prostate cases to the surgeon until they have reached this advanced stage. These practitioners may have followed for many years men with enlarged prostates whose symptoms were only a minor inconvenience and whose health was never affected by the prostate; they fear that a major operation may be advised for a harmless condition. Clearly, sound judgment lies between these extreme views.

PRESENT INVESTIGATION

My practice is to advise expectant treatment in about 20% of all cases of benign prostatic enlargement referred to hospital or seen in private consultation. In general expectant treatment is advised when (1) residual urine is absent or small in amount, (2) difficulty in micturition is absent or slight, and (3) there have been no attacks of acute retention. These conditions were fulfilled in 114 of the series of 129 patients discussed in the present investigation. Such patients sought advice chiefly because of frequent or hesitant micturition or hæmaturia.

Five patients with residual urine of over 6 oz., 1 patient with extreme difficulty in micturition, and 9 patients who had had attacks of acute retention were also treated expectantly, either because they were considered to be bad risks for operation or bec they were very reluctant to be operated on.

The advice given was simple and was meant to prev prostatic congestion. The patients were warned of danger of chills, alcoholic excess, and failure to d the urge to empty the bladder. They were advised report any increase in urinary symptoms or any evide of failing health, but it was suggested that no such was likely to happen. I tried to assess the psych reaction of the patient and to vary the advice so to avoid both morbid introspection and danger complacency.

Records of these cases have been kept since the of 1938. Information obtained at return visits, the patients' doctors, and in some cases from the friends is collected. Postal questionaries are sent patients who have not been seen for a time and whom doubt is felt. In addition all patients were questionaries in December, 1944, April, 1946, 1947, and January, 1949. When question forms returned by the post office an almoner visited district and usually succeeded in discovering the address. When no reply was received an almoner visited, and in most cases a reply was obtained. W the answers to the questions showed an increase symptoms, another examination was arranged. Wh information was received of a patient's death, lett were sent to his relations and to his doctor asking abo the cause of death and whether there had been a increase in urinary symptoms. During the last y invitations have been sent to all survivors asking th to attend for examination.

In the present survey all patients seen for the time during the last eighteen months and 2 who were untraced after the first visit are exclud but 8 patients who were followed for several yea but have been untraced recently are included. T series contains 129 cases of benign prostatic enlargeme where expectant treatment was advised. This includ all such cases referred to the urological clinic of t Victoria Infirmary or in private practice during th period. It does not include: (1) patients admitt with very advanced disease where treatment wou have been advised but for the moribund or almo moribund state; (2) patients with very slight enlarg ment both on rectal and endoscopic examination; a (3) cases in which firm areas were felt which sugge malignant change—these last were given the bene of endocrine therapy.

Cystoscopic and urethroscopic examinations have n been performed when the diagnosis could be establish by other means. Following the advice of Macalpi (1936) and others I reserved these methods chiefly f cases where hæmaturia had occurred or where t enlargement felt per rectum was not definite.

GENERAL RESULTS

In 13 cases I considered operation necessary aft a period of observation. In 12 of these the indicatio was obstruction, while in the remaining case seve hæmorrhages from the prostate followed a marriage la in life.

Four patients have consulted other surgeons an undergone operations. In 2 of these the indications a not known. In 1 obstruction was increasing. Th remaining case, followed for four years, had no evidenc of obstruction. The second surgeon agreed that th condition was static but believed that progressiv changes would occur later; it was also hoped to reduc the frequency of micturition—a result which had no yet come about six months after operation.

In 112 patients there has been no evidence of increasin obstruction. The len of follow-up in these eigh as been seen several times since then and shows little e in his general and local condition.

FREQUENCY OF MICTURITION

e more serious cases usually have more frequent rition than the less serious ones:

Frequency	*500 cases recommended for operation*	*129 cases treated expectantly*
reme at night (4 times or ore)	252 (*50%*)	31 (*24%*)
reme by day (every 1½ urs or less)	189 (*38%*)	29 (*22·5%*)

equent micturition in prostatic enlargement may be o various causes. Where there is residual urine, the anism is obvious. If the bladder still contains urine micturition, a shorter period of secretion will be red to reach the state of distension which produces lesire to pass water. This effect, however, may be ed partially, and even completely, by a gradual ase in the capacity of the bladder. In the absence sidual urine other causes may be effective. Local estion may produce irritability of the trigone: unculated middle lobe of the prostate may produce same type of irritation as does a stone or foreign : the enlargement of the prostate may develop ich a way that the bladder neck is dilated but the into the prostatic urethra is not blocked; the walls he urethra may not be accurately opposed to one her and may meet only at the most prominent parts he prostatic lobes, allowing urine to pass into the itive prostatic urethra and produce irritability and tency; and hypertrophy of the detrusor may etimes reduce the capacity of the bladder.

he table and the figures given above for extreme uency show that only 4 of 31 cases where night uency was extreme, and only 2 of 29 where day uency was extreme, have had a progressive course. degree of frequency has no prognostic significance. uent micturition is important only when its degree persistence cause exhaustion or great mental distress.

HÆMATURIA

pontaneous hæmaturia is said to be most common patients with incomplete retention (Marion 1940, lker 1933). This has not been my experience. In cases where residual urine was absent or scanty re were 24 (19%) cases of hæmaturia, whereas in cases in most of which the residual urine was conrable there were 82 (16%) cases of hæmaturia.

æmorrhage from the prostate is not usually severe l only rarely is it necessary to operate to prevent ther loss of blood. I encountered 2 such cases in 500. n the group of cases treated expectantly 24 had maturia, but only 3 of these showed progressively reasing obstruction. Hæmaturia is therefore of no gnostic significance.

GENERAL COURSE OF CHIEF SYMPTOMS

Nine patients had had attacks of acute retention before ir first visit; 2 of these had repeated attacks later d were treated by operation, but the remaining 7 ve had no recurrence of acute retention. The follow-up these 7 cases has been as follows: over eight years, case; over seven years, 2 cases; over five years, cases; over four years, 5 cases; and over three ars, 6 cases.

Fifty-three patients had slight or moderate difficulty micturition: in 8 of these the difficulty increased ficiently for operation to be advised; in 11 difficulty ntinued to occur at times; and in 34 the difficulty had isappeared at the time of the next questionary and did ot recur during the period of observation. The periods hich have elapsed since the first examination in ese 34 cases are as follows: over nine years, 1 case; ver eight years, 2 cases; over seven years, 3 cases; ver six years, 5 cases; over five years, 10 cases; over four years, 16 cases; over three years, 19 cases; over two years, 26 cases; and under two years, 8 cases.

Frequent micturition was the commonest complaint at the time of the first examination: 93 patients were disturbed more than once each night and had intervals of two hours or less during the day. In most of these cases this symptom showed fluctuations, but in 34 of them there was considerable improvement at the time of the next questionary, and this improvement was maintained throughout the period of observation. The duration of the follow-up in these 34 cases was as follows: over nine years, 1 case; over eight years, 2 cases: over seven years, 6 cases; over six years, 10 cases; over five years, 15 cases; over four years, 22 cases; over three years, 24 cases; over two years, 29 cases; and under two years, 5 cases.

DISCUSSION

The size of the prostate is unrelated to the degree of obstruction which it produces. On this point there is wide agreement (Joly 1924, Marion 1940, Walker 1933, Lowsley and Kirwin 1944, Hinman 1935, Keyes and Ferguson 1936). Obstruction depends on the form of the gland. Many enlarged prostates do not obstruct, or obstruct so little that a slight hypertrophy of the detrusor is sufficient to empty the bladder. Such cases are recognised by the absence of difficulty in micturition and of residual urine. The present investigation suggests that the non-obstructive or very slightly obstructive prostate has a strong tendency to remain so.

Sudden changes in the effects of an enlarged prostate are due to changes in vascularity. If great obstruction is produced, the efforts of the bladder to empty itself will maintain the congestion. If only slight obstruction or mere irritation is produced, the congestion may disappear and remain absent for a long time. If during the interval there has been active growth, the obstruction produced by the second attack may be much greater than that produced by the first. If the period of active growth has passed, the second attack is likely to be no more serious than the first. The present investigation suggests that active growth in the prostate ceases soon after the age of 60. The general course of symptoms shows that potentially obstructive and potentially symptom-producing prostates very often lie dormant for many years. It is therefore not unreasonable to suppose that growth ceases or becomes very slow after the age of 60, though most patients seek advice after that age.

Patients seek advice during an exacerbation of symptoms. If a prostate in a congested phase produces only slight obstruction, and if that prostate has passed its period of active growth, it is unlikely ever to be a source of danger. The present investigation, however, included chiefly patients with little or no residual urine and no history of acute retention. If the bladder muscle has been overdistended, an additional factor is introduced. Recovery of muscle tone will be less complete in the older patients.

Three clinical types of prostatic enlargement are commonly described:

(1) Classical progressive type described by Guyon (1888). The patient passes through periods of congestion, of incomplete retention without distension, and of incomplete retention with distension.

(2) Sudden acute retention with little or no previous history of urinary symptoms.

(3) Silent prostatic obstruction. The bladder distends gradually without well-marked urinary symptoms, and the patient complains, first of all, of loss of weight and energy or of gastro-intestinal symptoms. Such cases are rare. Of 629 prostatic patients referred to me only 4 were of this type.

The present investigation suggests that a fourth clinical type, the non-progressive type, should be included.

URINARY OBSTRUCTION

When the prostate obstructs, the bladder muscle hypertrophies. Joly's (1924) theory is probably the best explanation of the mechanism of obstruction in these cases. According to this view the hypertrophy of the bladder muscle will be completely ineffective in the more obstructive type of gland. The greater the intravesical pressure in such cases the more firmly is the urethra closed. In the less obstructive types, however, hypertrophy of the bladder muscle can overcome the obstruction.

Trabeculation of the Bladder

The innermost coat of the bladder muscle is incomplete and is in the form of plexiform muscle strands. When the bladder hypertrophies, these strands become prominent and produce trabeculation. Hallé and Motz (1902) described these changes in three degrees: in (1) the spaces between the trabeculæ reach only to the next muscle layer, and there is hypertrophy without disturbance of the normal anatomical arrangement; in (2) the spaces extend through the middle and outer muscle coats and reach the fibroserous layer; and in (3) the mucosa herniates through the whole thickness of the bladder wall. Compensation is adequate in the first degree, is failing in the second, and has already failed in the third.

In the present series 56 patients were examined cystoscopically. Trabeculation was found in a large proportion, strongly marked trabeculation being recorded in 14. Of these only 1 is included in the progressive group. Four of them have been followed for about five years; 1 of these has noted lately a decrease in the force of the flow of urine; the 3 others have no difficulty in micturition. Recent estimations of residual urine showed $1^1/_2$ oz. in 1 case and smaller quantities in the 3 others.

Trabeculation of the bladder seems to be of little value as an indication for operation. Trabeculation with multiple sacculation is no doubt an indication, but in my experience this condition has always been associated with a significant quantity of residual urine. However, as pointed out by Millin (1947), the absence of trabeculation is a strong contra-indication to operation.

Difficulty in Micturition

Difficulty in micturition is described in several ways by prostatic patients. Commonly they have noted weakness and lack of projectile force in the flow of urine, especially at the end of micturition, when the flow may become a dribble. The protracted effort required to empty the bladder is also often described. When difficulty was great, I recommended operation even if the patient could empty his bladder. Of 114 patients with standard indications for expectant treatment, 53 had slight or moderate difficulty in micturition, and 8 of these have shown evidence of increasing obstruction. In 61 cases there was no complaint of difficulty, and only 1 of these has developed difficulty later. It therefore seems that the patient's description of micturition is of considerable help in prognosis.

However, some patients who have a significant quantity of residual urine do not complain of difficulty in micturition. I found 44 such cases in a series of 500 recommended for operation. These 44 patients included many of the most advanced cases. Owing to loss of tone the bladder was believed to be empty when a considerable quantity of urine remained. Many of them had a urinary stream which would not have satisfied a normal fit man, but other symptoms, such as frequency and urgency of micturition, were so prominent that the patient thought little of a gradual decrease in the projectile power of the bladder. Even in the absence of a residual-urine estimation such cases would not readily be confused with the mild type which is discussed here.

Hesitancy in Micturition

In the initiation of micturition the bladder neck opened chiefly by flattening of its lower segment. T is a different mechanism from the contraction of detrusor which empties the bladder. It is there not surprising that hesitancy and difficulty in mict tion are not invariably associated with one anoth Hesitancy seems likely to be the less signific symptom, and this is borne out by the present surv

Residual Urine

When the bladder muscle fails to overcome obst at its outlet, emptying becomes incomplete, and surgeons consider the amount of residual urine to a very significant indication of prognosis.

Danger to life occurs when the effects of pressure felt in the upper urinary tract. The mechanism of t is uncertain. If the valve action of the lower becomes incompetent owing to abnormal distension the bladder (Graves and Davidoff 1923), the amount residual urine may be considered an infallible gui If obstruction is produced in the lower ureter by overactive trigone (Young and Davis 1926) or by a hyp trophied detrusor (Kreutzmann 1928), the amount residual urine is a less reliable guide. The second vi is more probable, since cases are sometimes seen wh the upper urinary tract is dilated though there is residual urine. Millin (1947) points out this danger, b such cases are rare and unlikely to be missed if extre difficulty in micturition is considered seriously and if doubtful cases are examined by intravenous pyelograph

Fallacies in Estimation of Residual Urine

Several fallacies in the estimation of residual uri must be remembered. Kirwin and Hawes (1939) ha shown that a normal man who has retained his urine voluntary effort for an unusually long time may have considerable quantity of residual urine. This has obvio practical importance. Many patients with a urina complaint feel it their duty to come for advice wi a full bladder to provide a specimen. If a special effo of this kind has been made, the amount of resid *urine may be an unreliable guide.*

Many men have difficulty in micturition in the presen of others. It is useful to confirm the patient's descripti of the force of flow of his urine, but in many cases it advisable to allow the patient to pass urine alone so to obtain an accurate measure of the residual urine.

Infection reduces the amount of residual urine. the infection becomes chronic, the residual urine w never reach its former level (Ogier Ward 1943). Su changes must not be mistaken for improvement.

The amount of residual urine varies from day to da Too much reliance must not be placed on a sing estimation. If there is any doubt, the patient shou return for a second estimation.

Kirwin and Hawes (1939) have shown that a so rubber catheter empties the bladder less complete than does a cystoscope sheath. However, the differen was only 3–10 ml., a quantity unlikely to influence decision for or against operation. I use soft rubb catheters to reduce trauma to a minimum.

The small number of progressive cases in the presen series suggests that a low residual urine is a valuabl guide in the selection of cases for expectant treatmen I do not suggest, however, that the presence of more tha 4 oz. of residual urine is a certain indication of an earl downhill course.

A patient seen four years ago had over 6 oz. on tw occasions. Owing to an anginal attack a few months befor expectant treatment was advised. It has been impossib to see him again, but he reports improved health and le troublesome urinary symptoms.

A frail dyspnœic man of 87, seen for the first time two yea ago, had a bladder distended to the level of his umbilicus

EROYL-POLYGLUTAMIC ACIDS IN THE REATMENT OF PERNICIOUS ANÆMIA

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OLIC acid (pteroyl-γ-glutamic acid) was isolated from ral sources, such as green leaves and grasses, as well east, liver, kidney, and many other natural food-s. It normally occurs in food in the form of closely ted conjugated substances (Bird et al. 1945) which essentially polyglutamates—i.e., pteroyl-γ-glutamic combined, through the γ carbon atoms of the amic-acid molecules, with further numbers of amic-acid molecules, which can be broken down by me or bacterial action into the parent folic acid.

olic acid itself is almost universally active in relation acterial growth or the relief of certain deficiency rbances in human, animal, and chick anæmias or ral leucopenias, but the pteroyl-glutamic acid con-tes or polyglutamates have much more restricted ons until they have been hydrolysed.

wo naturally occurring crystalline polyglutamates e been isolated from different sources:

) Pteroyl-hepta-γ-glutamic acid (pteroyl-hexa-γ-glutamyl-mamic acid; the yeast-vitamin B_c conjugate), which was ted by Pfiffner et al. (1946) from yeast extracts and has effect on growth of *Lactobacillus casei* and *Streptococcus lis.*

) Pteroyl-tri-γ-glutamic acid (or pteroyl-di-γ-glutamyl-γ-amic acid; the "fermentation" or *L. casei* factor), pared by Hutchings et al. (1944) from certain coryne-ria residues, promotes growth of *L. casei* but has only the activity for *Strep. fæcalis.*

he remarkable therapeutic and hæmatological results ained with folic acid in the treatment of pernicious mia (see Wilkinson 1948) naturally suggested that c-acid deficiency played a part in the ætiology of this ase; consequently it was suggested by some workers t patients with pernicious anæmia were able to utilise y the parent folic acid and not the pteroyl-poly-tamates from which it is normally formed. In persons hout megaloblastic anæmia folic acid was thought by e to be liberated by the action of either the normal tric juices (hæmopoietin) or enzymes elaborated by, present in, the liver or elsewhere in the body (Bethell l. 1947, Heinle et al. 1946–47a and b). These observa-ts were based on definitely suboptimal doses of the ural conjugates; and, though the clinical details were convincing, Bethell et al. (1947) concluded that the ient with pernicious anæmia cannot utilise these jugates; the failure was not absolute and varied in erent patients, depending in part on the presence of onjugase-inhibiting substance in the extracts. Spies 47) claimed hæmatological responses in pernicious mia after using both natural and synthetic poly-tamates, including a diglutamate. Sharp and nder Heide (1947) showed that natural B_c conjugate eroyl-hepta-γ-glutamic acid) not only produced good missions in pernicious anæmia but also increased the nary excretion of pteroyl-γ-glutamic acid as in normal ople.

Jukes et al. (1947) observed that in normal people eroyl-tri- and di-glutamic acids were readily hydrolysed d excreted in the urine as folic acid, and Jukes and Stokstad (1948) noted that a patient with pernicious anæmia gave a submaximal response when given 3 mg. of pteroyl-tri-γ-glutamic acid daily intramuscularly for 11 days. In view of these conflicting reports, and the bearing of these results on the ætiology of pernicious anæmia, we have explored the situation further, using the synthetic polyglutamic acids.

MATERIALS AND METHOD

We used two of these synthetic folic acid conjugates: (1) pteroyl-tri-γ-glutamic acid (teropterin); and (2) pteroyl-di-α-glutamic acid (diopterin). They were provided as dry sterile powders, and for use by any route they were dissolved in appropriate volumes of a sterile phosphate buffer solution at pH 7·4.

Thirteen patients with pernicious anæmia were treated with these folic acid conjugates, eleven were new cases, and two had attended the clinic before and had relapsed because they had neglected treatment. All had achlorhydria and predominantly megaloblastic marrows with macrocytic anæmias at the time of the tests. All except case 7—a severely anæmic and ill patient—had been observed for at least a 7-day control period before any treatment was given, the reticulocyte-counts remaining low during that time. Eight patients were treated with

RESPONSE OF PATIENTS WITH PERNICIOUS ANÆMIA TREATED WITH TEROPTERIN AND DIOPTERIN

Case no.	Sex	Age (yr.)	Day	Red cells (millions per c.mm.)	Hb (g. per 100 ml.)	Reticulocyte peak		Treatment* (dose in mg., day when given)
						Day	Retics. %	
1	M	72	0 13 60	1·420 2·720 4·310	5·3 10·3 14·2	5	25·6	100/1, 100/2, 40/13, 40/19, 60/26, 60/33, 60/40, 60/47: all teropterin
2	M	39	0 14 56	0·870 2·010 3·860	2·9 7·4 12·7	7	26·6	100/1, 100/2, 40/16, 20/28, 40/35, 40/42: all teropterin
3	F	65	0 17	1·520 3·010	5·7 11·2	6	22·1	100/1: teropterin intravenously
4	F	48	0 15 57	2·500 3·570 4·790	11·0 12·7 14·2	8	6·9	100/1, 60/2, 40/15, 60/22, 60/29, 60/36, 60/43, 80/50: all teropterin
5	F	32	0 12 33	1·240 2·520 3·550	3·8 8·5 10·6	6	21·4	100/1, 100/2, 100/12, 40/19, 60/27: all teropterin
6	F	68	0 14 35	2·490 2·910 2·700	9·8 10·4 11·6	6	6·2	80/1, 60/2, 60/8, 60/14, 60/21, 60/28: all teropterin
7	F	61	0 18 46	0·620 1·760 2·820	2·6 5·6 10·4	7	36·2	140/1, 60/2, 80/16, 100/23, 40/31, 40/32, 40/33, 40/34, 40/35, 40/36, 40/37: all teropterin
8	F	51	0 13 28	1·760 2·710 4·120	5·6 8·9 12·7	6½	26·0	20 mg. teropterin orally daily for 21 days
9	M	48	0 14 21 35	1·710 1·730 1·950 2·820	5·9 6·2 6·6 10·2	5	10·0	50/1, 50/2, 100/14: all diopterin intravenously
10	M	46	0 21 35	1·820 2·210 3·420	6·2 7·7 11·5	13	14·2	100/1, 50/2, 50/8: all diopterin
11	F	75	0 14 34	1·750 3·010 3·630	6·7 10·7 11·9	6	17·2	50/1, 50/2, 50/3, 50/16: all diopterin intravenously
12	F	30	0 11 54	1·650 1·790 3·390	5·9 5·9 13·4	8 18	10·6 27·6	100/1, 50/2 diopterin, followed by 100/11, 60/12, 60/32, 80/38, 60/45 teropterin
13	F	71	0 10 34	1·840 2·720 4·240	6·8 9·5 13·0	5	14·8	100/1, 50/2 diopterin, followed by 100/10, 60/26, 60/27 teropterin

* Intramuscularly unless otherwise stated.

This group would include those patients who have no difficulty in micturition and no residual urine and those over the age of 65 who have slight difficulty. There were 85 such patients in the present series: 2 have shown evidence of increasing obstruction, 1 has had an operation by a surgeon whose precise standards are not known; and 82 have been observed for the following periods: over nine years, 4 cases; over eight years, 9 cases; over seven years, 12 cases; over six years, 19 cases; over five years, 25 cases; over four years, 39 cases; over three years, 50 cases; over two years, 68 cases; and under two years, 14 cases. These patients have shown no evidence of increasing obstruction. Recent residual-urine estimations in 41 of them have shown *insignificant quantities*.

Such cases probably exist in enormous numbers. In the past these patients accepted their symptoms as a natural result of their age, but with spreading knowledge more and more of them tend to seek advice. They might all be regarded as in the first stage of the classical progressive type, but the present study suggests that this is true only of a small minority. No clinical classification is precise, but the cases of the suggested non-progressive type have been sufficiently consistent in their course to justify grouping them together for practical purposes.

Non-progressive cases are described by many workers but usually as rare exceptions. The published reports abound in question-begging terms. Mild prostatic obstruction is called an "early prostate." Expectant treatment is described as "postponing" operation. These might be added to the "witch words" of Sir Alan Herbert (Herbert 1935).

In selecting cases for operation, difficulty in micturition, residual urine, and age are important, and frequency of micturition, the size of the gland, hæmaturia, and trabeculation of the bladder are not significant. It is suggested that patients whose difficulty in micturition is not great and who have little or no residual urine should be treated expectantly. Slight difficulty in micturition should be considered more significant in patients under the age of 60 than in older patients. Severe hæmaturia is an indication for operation in exceptional cases. Persistent extreme frequency of micturition may cause exhaustion and render life intolerable. In such cases operation may be considered, but it must be remembered that prostatic operations do not invariably relieve frequent micturition. When the frequency is due to residual urine, the removal of the obstruction will relieve it. When there is no residual urine, the result is much less certain. Riches and Muir (1933), investigating cases treated by a group of surgeons, found frequency of more than twice a night in 12 of 68 who had undergone prostatectomy. This unsatisfactory sequel may have been diminished by modern chemotherapy and by the new operations, but it has not been eliminated.

Expectant treatment is given a place by almost all urologists. Ogier Ward (1946) advised against operating for frequent micturition alone, but this important warning is not often mentioned in published reports of prostatic surgery. Of eight students' textbooks of general surgery examined by me five do not mention expectant treatment at all.

It is certainly unjustifiable to remove the prostate merely because it is enlarged and has been associated with some urinary symptoms. This fact should be made clear to the medical student. Prostatic enlargement should be regarded, like the arcus senilis of the cornea and the greying and thinning of the hair, as an anatomical feature of old age which occurs often enough to be regarded as a variety of the normal. Only when obstruction to the flow of urine is produced does it become a disease.

SUMMARY

Expectant treatment was advised in 129 cases enlarged prostate, and their progress was followed.

In 114 cases the evidence of obstruction was sl 13 patients were operated on by me after a period observation; 4 have had operations by other The period of observation varied from $9^1/_2$ to $1^1/_2$

Eighteen patients have died. Possibly the prostate w responsible in the case of 1 patient aged 91, but it is v improbable that it was in the remaining 17 cases. For t ages and duration of follow-up the death-rate was norm

Nine patients showed definite evidence of incr obstruction, and the clinical features of those cases *compared with those of the entire series.*

A progressive course occurred in only 1 patient over t age of 60.

The size of the gland was not related to the of obstruction or to a progressive course.

Trabeculation of the bladder was not a signific indication of prognosis.

Patients without any complaint of difficulty in mi tion at the first examination were rarely progressive ca

The significance of residual urine and fallacies in estimation are discussed.

Frequency of micturition is, on the whole, great in the more serious cases but is of no value in assessing t danger of progressive obstruction in the individual ca

Hæmaturia is not a significant indication of prognos

The general course of symptoms shows that patien tend to seek advice in a phase of congestion. In a co siderable number the chief symptom had much improv within a few months, and this improvement was w maintained.

The non-obstructive or only slightly obstructi prostate has a strong tendency to remain so.

The growth of the prostate seems to slow down ab the age of 60. The age of onset of symptoms depends an attack of congestion.

A non-progressive type exists and can be identifie by the absence of difficulty *in micturition* and residual urine. Such patients should be treate expectantly. When difficulty in micturition is not grea and residual urine is slight, expectant treatment shoul also be advised. A non-progressive course is likel in the older patients and in a considerable proportion o the younger ones.

Frequent micturition and hæmaturia are indication for operation only in rare cases.

I am grateful to Dr. R. A. Robb, lecturer in statistics the University of Glasgow, for his study of the mortality ra in my cases; to the almoners of the Victoria Infirmary whose enthusiasm is the reason for the very small numbe of untraced cases; and to the resident doctors, nurses, an clerks of the infirmary.

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obtained. Swendseid et al. (1947) showed that the etion of free folic acid in the urine after a dose of a-γ-glutamic-acid conjugate depended on the pre- e or absence of conjugase inhibitors in the extract; hey were absent, free folic acid was excreted in unts equivalent to the dose of conjugate given.

e have not been able to test the pteroyl-hepta-γ- amic acid, but there now seem to be good grounds concluding that, if it is obtained free from conjugase bitors and a sufficient dose is given, it can be utilised he patient with pernicious anæmia in the same way ther conjugates.

he responses obtained with diopterin (pteroyl-α- utamic acid) are especially interesting, because oterin is an artificial substance with the glutamic- l molecules linked through the α carbon atoms in a nner that hitherto is not known to occur in nature. observation that patients were somewhat less ponsive to diopterin than to teropterin corresponds h the results of Jukes et al. (1947), who used urinary retion of free folic acid as a test of the hydrolysis of synthetic polyglutamic acid used; they found that, olic acid was given to a normal person, 90% of the e was excreted within 6 hours; with teroptin there s a lag, and the corresponding free folic acid appeared ween 6 and 24 hours later; with diopterin the lag s longer than 24 hours.

When it was first appreciated that patients with nicious anæmia responded to folic acid itself, and that ic acid occurred naturally in the conjugated triglutamic- d and heptaglutamic-acid forms, the hypothesis that pernicious-anæmia patient might not be able to drolyse conjugated forms was suggested by Bethell et al. 47), Heinle et al. (1946–47a and b), and Spies (1947). e early failures to obtain responses with folic-acid njugates appeared to support this hypothesis, and vidson (1948) suggested that "the fundamental defect addisonian pernicious anæmia is the patient's inability utilise pteroylheptaglutamic acid." Our results show at there is no basis for the assumption that patients th pernicious anæmia cannot hydrolyse the conjugated rms, or even utilise them directly, and the results of hers already cited have shown where the fallacy lies. is unfortunate that statements about the rôle of ic-acid conjugates in the ætiology of pernicious æmia have reached the textbooks, because the newer idence, including that about B_{12}, seems to suggest that th present knowledge neither folic acid nor its con- gates play any major part in the ætiology of the human rnicious-anæmia syndrome (Wilkinson 1948).

SUMMARY

Thirteen patients with pernicious anæmia were treated th the synthetic folic-acid conjugates pteroyl-γ- glutamic acid (teropterin) and pteroyl-α-diglutamic id (diopterin).

Eight patients were treated with teropterin alone via e intravenous, intramuscular, and oral routes. All owed normal responses with reticulocytoses and subse- ent increases of red cells and hæmoglobin. Three tients were treated with diopterin alone, intravenously d intramuscularly. The doses available were minimal, t all three showed reticulocyte responses, and reason- le increases of red cells and hæmoglobin followed. wo further patients were given diopterin and then ropterin; in one a poor response to diopterin was llowed by a good response to teropterin, whereas the her patient responded satisfactorily to both.

Continuation treatment with teropterin was given to e patients, and the blood-counts were raised to normal nearly normal levels with the doses available.

Evidence is therefore presented that patients with rnicious anæmia can hydrolyse and utilise folic-acid njugates (pteroyl-polyglutamic acids) whether of a aturally occurring γ-amino type, like teropterin, or an α-amino type, like diopterin, which does not occur in nature. There is thus no reason for supposing that in pernicious anæmia there is a failure to release free folic acid from its conjugated forms.

We wish to thank Dr. R. W. Linton and Dr. S. D. McIsaacs, of Lederle Laboratories Division, Cyanamid Products Ltd., for supplying us with these synthetic pteroyl-polyglutamic acids.

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MENORRHAGIA OF EMOTIONAL ORIGIN*

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Faced with a baffling case of menorrhagia, few consider whether the cause may be emotional. Indeed, I have found only one textbook which devotes so much as a paragraph to "psychogenic menorrhagia." This is curious, as amenorrhœa of emotional origin is well recognised. Yet this is a far commoner cause of menorrhagia than some of the others which are fully described.

The importance of recognising an underlying emotional origin of menorrhagia lies first in the possibility of cure by appropriate advice, reassurance, or even formal psychotherapy, and secondly in the avoidance of unnecessary surgery—even such radical operations as hysterectomy may have been contemplated. Psychogenic menorrhagia is in my experience easier to cure than psychogenic amenorrhœa.

CASE-RECORDS

The following cases are selected partly because of the severity of the menorrhagia and partly because their histories indicate the degree of emotional upset.

Case 1.—A rather sensitive woman in her early twenties had married a sailor. Six months after the marriage her periods began to be more profuse, the cycle shortened to a fortnight, and the period of loss gradually lengthened. When I saw her a year after the marriage she seemed healthy, and her pelvic organs were normal. I gave her a preparation of ergot with no benefit, and then, as she got worse, I did a dilatation and curettage.

After this the bleeding became more or less continuous, and the patient became seriously anæmic in two or three months. She developed a fine tremor of the hands, lost weight, and slept badly. These symptoms I attributed to anxiety; so I tackled her from the psychological aspect, as I had done before without success, and eventually persuaded her to speak out. It proved that her husband was a sexual pervert, and there had never been anything except abnormal sexual relations. The prospect of such relations continuing had become absolutely intolerable to her. As the husband refused treatment or to alter his ways I advised her to consult a society giving free legal aid and to obtain a separation order. This she obtained, and within a few days the bleeding ceased, and there was no further menorrhagia when I last saw her some months later.

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* Based on a contribution to the Royal Society of Medicine in March, 1949.

teropterin alone, and three with diopterin alone; two had diopterin followed by teropterin. The results are shown in the table and figs. 1–3.

RESULTS

Pteroyl-tri-γ-glutamic Acid (Teropterin).—All the patients responded satisfactorily. Cases 1 and 4 show that, with an initial intramuscular dose of 100 mg. on 2 days and then, after the initial response, a dose of 40–80 mg. at intervals of about 7 days, the blood-count could be raised to levels approaching normal; case 8 shows that the same result could be obtained with a dose of 20 mg. daily by mouth. The other patients showed equally satisfactory initial responses; as with other forms of treatment, the increase in red cells and hæmoglobin varied a good deal in different patients. As supplies were limited, the teropterin treatment could not be continued very far. For this reason we could not maintain any patient on teropterin for longer than 60 days. Case 7 is interesting because the patient's initial count was exceptionally low and her general condition poor; her reticulocytes rose from 0·2 to 4·0% in 48 hours, and to 18·6% in 72 hours—a response quite as rapid as would be expected with a similar dose of folic acid. Case 3 shows that the response to a single intravenous dose of teropterin 100 mg. can also be similar to that obtainable with folic acid (Wilkinson 1948, Wilkinson et al. 1946).

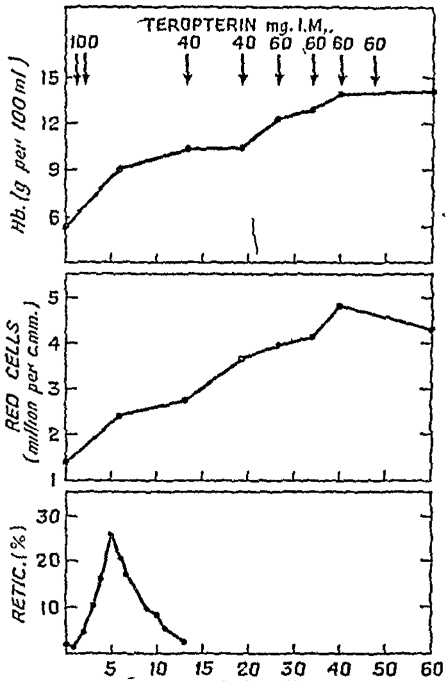


Fig. 1—Response of case 1 to intramuscular teropterin.

Pteroyl-di-α-glutamic Acid (Diopterin).—The results with diopterin suggest that we were working with minimal doses; and, since we had very little of this material, no patient was taken up to normal blood levels. A dose of 100 mg. produced a moderate reticulocyte response in case 9, but only slight delayed increases in red cells and hæmoglobin. An initial dose of 150 mg. had a similar effect in case 12, but in cases 10, 11, and 13 the increases in reticulocytes were higher and in red cells and hæmoglobin definite, though less perhaps than might have been expected with similar doses of teropterin or folic acid.

Teropterin Following Initial Treatment with Diopterin.—Case 12 shows that teropterin produced a good response in a patient who had shown only slight response to a similar dose of diopterin. In case 13 the red cells and hæmoglobin increased to nearly normal levels under treatment with teropterin after a good initial response to diopterin.

DISCUSSION

These results make it clear that patients with pernicious anæmia can utilise folic-acid conjugates, presumably by hydrolysis, and liberation of free folic acid. Provided adequate doses are given, intravenous, intramuscular, and oral administration will all produce typical reticulocyte responses followed by proper increases in red cells and hæmoglobin; the clinical state of the patient improves in exactly the same way as it does after treatment with folic acid itself (Wilkinson 1948). We believe that, if enough material had been available, these patients could have attained normal blood-counts on treatment with folic-acid conjugates alone. Whet normal counts could be maintained by conjugates, cannot yet say, but experience with folic acid it makes us cautious.

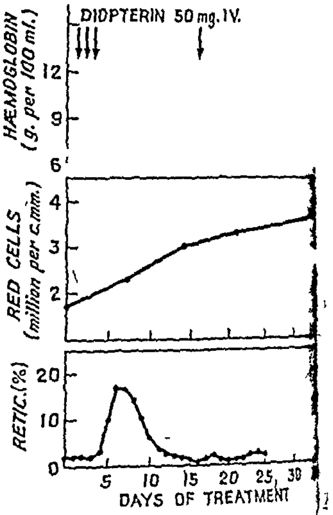


Fig. 2—Response of case 2 to intraveno diopterin.

These results are opposed to the earlier reports other workers, who suggested that patients with pe nicious anæmia *would not respond to* naturally occurr conjugates, and in fact could not utilise these compound Later investigations explain this disagreement. used the pure synthetic compounds; the earlier work had to be content with concentrates prepared fr natural sources. These concentrates had two di advantages: (1) the available dose was often too smal and (2) these concentrates are said to contain conju inhibitors that prevent hydrolysis of the folic-acid co jugates. Bethell et al. (1947), using a concentrate of th pteroyl-hepta-γ-glutamic acid, showed that irregul results were probably due to the presence of the conjugase inhibitors; when extracts with only we inhibitor activity were given to two patients wi pernicious anæmia, a reasonable hæmatological respons

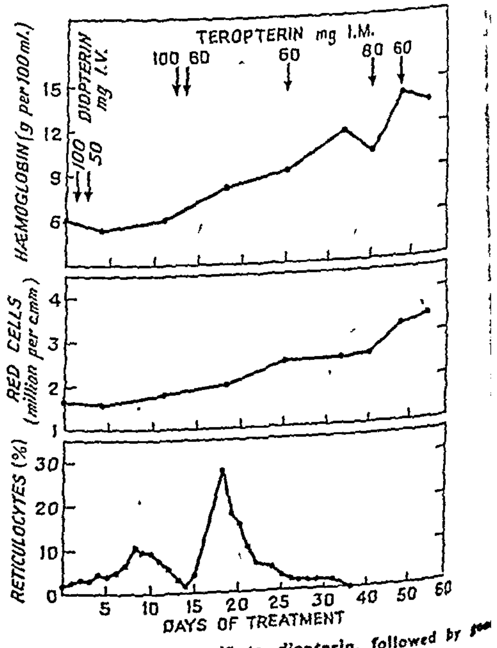


Fig. 3—Poor response of case 12 to diopterin, followed by goo response to intramuscular teropterin.

ement a month before since she had decided that the age would not be a success; none the less she was upset, because she had been engaged for two years and than once had slept with the man. She had lost her spect.

ittle reassurance and encouragement went a long way. two months later she was much better, the periods had less painful, and there was little menorrhagia. She had e examination but did not know the result. For the last ionths the periods have been normal (she passed the ination).

se 8.—A married woman, aged 31, complained of rrhagia and polymenorrhœa for 18 months. For a year leeding had been more or less unceasing, the loss being y slight. Latterly there had been some slight improve-, inasmuch as she had twice had an interval of a week from bleeding. For 10 months she had been sleeping , staying awake till 4 A.M., and she had not been eating These symptoms dated from an attack of measles. Her r had given her 'Antuitrin S' for several months ut benefit.

amination showed nothing abnormal in the pelvis; so uired about her past life. She had been engaged before ar, and after six years the engagement had been broken utual agreement. She had become engaged again during ar, and her fiancé had been blown up by a land-mine in andy, both legs being badly injured and later amputated. as in hospital for a year or so in this country, and when could get leave from the A.T.S. she would make long eys to see him and try to cheer him up. He wanted to and she had a long and difficult time persuading him to At the end of this time he broke the engagement. She much upset but decided to keep her troubles to herself be matter-of-fact about it, since her mother was in ill th and her father was abroad. She had slept badly at time. Six months later the menorrhagia had begun n. According to the patient her fiancé had been mentally rmal ever since his injuries and remained so; she corresponded with his mother.

ough I considered this a case of emotional menorrhagia ought it wise to do a diagnostic curettage, but the patient ed. Her doctor writes to say that the patient's mother is nt on making her daughter a chronic invalid, and that it e who opposed admission to hospital.

DISCUSSION

n these cases the proof of an emotional origin for the iorrhagia lies largely in the recovery that takes place n the emotional state returns to one of tranquillity. hat strikes me about all these cases is the severity the menorrhagia, in particular the long spells of ding and the way in which it continued until the chological difficulties were dealt with. I had realised t the anxiety of coming into hospital for operation n brings on a period, and that many emotional situa-s produce a single heavy period, but I had not reciated that long-continued menorrhagia of this ree could be entirely psychogenic. Incidentally, it very obvious during the war that fatigue was a ly frequent cause of menorrhagia—e.g., members of W.A.A.F. engaged on night work, plotting enemy craft, complained of this, and all that was required in se cases was a change to day work and a less exacting . Many of these patients presenting themselves with norrhagia as the prominent symptom are referred specialist physicians and good general practitioners o have never suspected its psychological origin. Many these patients are normal women subjected to excessive otional strain; there is usually a delay of 6–12 onths from the onset of the strain before the menor-agia starts. Often, but not always, other symptoms e present suggesting a psychogenic origin, such as eeplessness and being easily tired.

I can confirm what other workers have stated—that permenorrhœa (increased length of the period rather an increased flow) is common, as is a shortened cycle olymenorrhœa)—but true menorrhagia is also common. believe that many intermenstrual bleedings are of notional origin. I have come to think that many patients diagnosed by gynæcologists as having mild hyperthyroidism causing menorrhagia are suffering from anxiety states. I have waited unsuccessfully many years to see a case of menorrhage due to this cause, and I agree with those thyroid surgeons who believe hyperthyroidism is never a cause of menorrhagia.

Miller (1931) says: "My experience with many forms of menorrhagia has led me to believe that the majority of them, if not all, are purely psychical in origin and because of this, are curable non-medicinally and non-surgically." I would not go so far as this, but I have found drugs and endocrines singularly ineffectual, though the latter may control an individual period to some extent. Curettage is of diagnostic value, but other surgical measures are to be avoided. I believe that most menorrhagias when the endometrium is normal are to be explained as being psychogenic.

Allen (1935) published a study of more than a hundred patients in a mental hospital with menstrual disorders; in his summary he says:

> "These menstrual variations seemed to be somewhat characteristic of the different types of personality disorders, but only because of the different emotional reactions which they presented. . . . The emotional factor was the only one that appeared to have a definite correlation, both *quantitatively* and *qualitatively* with variations in the menstrual function. . . . A depressive mood, physical depletion and motor underactivity are conducive to amenorrhœa. . . . An expansive, elated or ecstatic mood, with good physical condition and motor overactivity, predisposes to a profuse and prolonged period. Agitation and worry are more apt to be associated with a profuse than a decreased flow."

From my own experience I would say this is true.

The normal reaction of a person to difficulties he can recognise and understand is to fight back, and there is increased nervous activity, which is widespread. A common reaction to obscure and ill-appreciated difficulties is one of increasing apathy, with decreased nervous activity. Several workers have noticed comparable changes of activity in different organs in these differing circumstances. Wolf and Wolff (1947) describe the case of a man, aged 57, who had a large gastrostomy opening (for stricture of the œsophagus) with prolapse of the gastric mucosa.

> He was perhaps more emotional than the average man but not abnormally so. Changes were observed in the colour of the mucosa according to his emotions and were accompanied by corresponding but slighter changes in the colour of his face. The emotionally charged situations were not produced experimentally but occurred spontaneously. Fear, with a feeling of helplessness, caused short-lived blanching; sadness, discouragement, self-reproach, and anything which caused depression caused protracted blanching. On the other hand, anxiety or alarm which provoked action, and particularly resentment and hostility, caused well-marked and long-continued flushing. The most striking observations were made over a period of five weeks during which the patient was suffering from prolonged anxiety, frustration, and resentment, with much repressed conflict. During all these five weeks, whether he was waking or sleeping, a persistent hyperæmia was noted. The observers noted that when the gastric mucosa was hyperæmic, it more readily registered pain and discomfort, and it took very little to make it bleed. Flushing or blanching of the gastric mucosa seemed to be part of a general reaction.

Wolff (1947) shows that not only does the mucosa of the stomach alter in vascularity with the emotional state, but also the mucosa of the nose, bladder, large bowel, and vagina.

Almy and Tulin (1947) describe experiments made on seven healthy male students, who were subjected to severe discomfort until they felt nauseated and were sweating; their colon mucosa was observed through a prostoscope inserted before each experiment began. In every case the vascularity and secretion from the mucosa and the motility of the bowel were increased.

Mittelmann (1946) found that fear, dejection, and disgust were associated with pallor of the nasal mucosa and decreased

It has been suggested that continual bleeding can occur as a defence mechanism to make it impossible for coitus to take place, but in this case the cause I believe was anxiety and disgust, giving rise to unrelieved emotional conflict, since the patient had felt unable to leave her husband.

Case 2.—I first saw this patient on March 13, 1945, when she was 29 years old and had a young child. She complained of menorrhagia, which had begun about six months after her marriage three years previously and had recurred whenever she had difficulty with her husband, which was fairly often. On Jan. 6 he had produced a revolver and threatened to shoot her. He had often been violent, and as he was a powerfully built policeman she had become seriously anxious for herself and the child. She had bled almost continuously since Jan. 6 and was obviously anæmic. She had become "nervy" and complained of an odd sensation in the throat. On questioning, it came out that her husband had always been a sexual pervert, and unpleasant happenings occurred increasingly often. She had never told her doctor this, because she had remained very fond of her husband.

I explained to her that her severe emotional strain was the whole cause of her menorrhagia, and in the interests of her health she must separate from her husband immediately, and preferably divorce him as soon as possible. The husband refused to admit he was abnormal and to consult a psychiatrist. The patient took my advice and during the next $2^1/_2$ years was much improved; she then got her divorce and her periods immediately became normal.

I saw her again six months after her divorce, when she had married again. She was complaining of nine weeks' amenorrhœa, apart from a very scanty loss while taking stilbœstrol, and feared she might be pregnant. She had been given stilbœstrol for three weeks, finishing a week before I saw her. I reassured her, and within two days she had a normal period. This was possibly due to the withdrawal of the stilbœstrol. Her periods have since remained normal, and she is very well and happy.

It is of interest that the same woman had menorrhagia at one time and oligomenorrhœa at another, both due to anxiety.

Case 3.—A married woman, aged 30, complained of almost continuous bleeding for three months. Her husband was making excessive sensual demands on her, and these were occasionally abnormal. Sexual relations had become repulsive to her for the past year, and she had remonstrated with her husband without avail. She was very fond of him, and there was mental conflict about what to do.

I suggested diagnostic dilatation and curettage, but this was refused. As I thought the menorrhagia was emotional in origin I spoke to her doctor, and he took the matter up with the husband, who mended his ways and behaved normally for some months. During this time the patient's periods returned to 7 days every 28.

The husband has recently reverted to his former habits and now includes physical violence in his behaviour towards his wife. The result has been that the periods have become heavier and more frequent, lasting 10 days every 20.

Case 4.—A woman, aged 23, came to me with her first pregnancy at term. There was disproportion, and I advised a trial labour. Shortly afterwards I saw her again, when she had been in labour 24 hours with poor pains; she was in a state of considerable apprehension, which neither her doctor nor I could dispel. I delivered her by cæsarean section. For the next eleven months she bled continuously, apart from three breaks, one of 14 days while a kindly nurse, an old friend, stayed with her, and two of 4 days, one of which followed a dilatation and curettage eight months after the cæsarean section. The dilatation and curettage revealed nothing abnormal. The patient was living in her mother-in-law's house; she liked her mother-in-law, but found her sister-in-law and her child very trying. The sister-in-law was playing fast and loose with various young men, and the child was obstreperous. During all this time the patient was tense and easily agitated. Shortly after she had moved to a house of her own the bleeding stopped and the periods became infrequent and irregular, every 2–4 months, but lasting 12–14 days with heavy loss.

I saw her $2^1/_2$ years later, when she was upset at not having become pregnant again; she felt she was always a failure, in that first she had had to have a cæsarean section and now she could not become pregnant. She was quite about it, was sleeping badly, had nightmares, and agitated. The periods for 10 weeks had been irregular, or so loss, with 1–14 days' interval. Examination normal uterus.

It came out that she had been raped, when only 12 old, on more than one occasion by the same man, and I sure this was responsible for her general state of emotional tension, which she tried to counter with her will; she had lived for months in extreme apprehension— thing she expected the family doctor to knock at the door and present her with a baby any day. She had months' amenorrhœa at this time; this may or may not been a sequel. I talked to her for some time on two and reassured her about the prospects of having child, and told her that with proper management a delivery was probable.

I have learnt since from her doctor that she is and that menstruation is very irregular still. She fears to sleep because she dreams of being raped in front of husband and child. This is the first time she has brought self to tell of her dreams, which we knew were unpleasant.

Case 5.—A rather neurotic woman, aged 31, menorrhagia for three months, the periods lasting 5 or 6 d every fortnight. Her husband, also a neurotic, had been in the Forces, and after his return she had noted he "cool." She had found he was conducting an affair another woman; this had lasted for six months before he h given it up. He had regretted having hurt his wife's feeli and had tried to make it up, but he had begun to have nerv symptoms, and these had caused his wife much anxie because they were genuinely fond of each other. In additi to menorrhagia, the wife complained of headaches, dyspn and palpitation. Her hæmoglobin was only 66% (Halda I referred her to Dr. D. F. O'Neill, who undertook psychia treatment of both husband and wife, and within three mont the periods became normal. Menstruation has remain normal up to now.

Case 6.—A woman, aged 24, complained of 18 mont menorrhagia. The periods lasted 7–10 days, and there w heavy loss. There was also "spotting" for 3 or 4 days befo a period and half-way between. Also if she got excited upset she would have slight spotting or even an embarrassi loss. This would happen usually when she stood up af some emotional experience—e.g., seeing an exciting film Sh slept badly and felt very tired. Her family history showe some mental instability, but her childhood had been happy though the family was always on the move. On leaving scho she had tried to do nursing, but the work was too heavy, and she was advised to give it up. At that time she had ha menorrhagia and excessive fatigue. In 1946 she had marrie and gone to the U.S.A., where she lived with her in-la who were noisy and argumentative. One of the family was in trouble with the police, and she had lived in a state of apprehension; every time there was a knock at the door she thoug it was the police come for her brother-in-law. She had fall out with her mother-in-law, who accused her of stealing th things her brother-in-law had taken. During this time sh had developed severe menorrhagia. She was definitely woman of hysterical personality, and she had always foun her periods more profuse than normal and affected b emotional states and changes in climate.

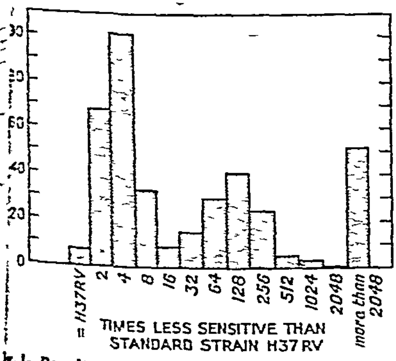
When I saw her she was still unhappy and frustrated; sh had no work and was temporarily separated from her husband I found no organic disease and referred her to Dr. O'Neill who gave her simple psychotherapy and advised her to com to him occasionally for supervision. During the short tim she was under observation she was much improved. Sh then returned to the U.S.A. where she reports that she i quite well.

Case 7.—A young single woman complained of menstrua irregularity and menorrhagia. She had had a heavy perio lasting 6 or 7 days in March, 1948, with pain; this had bee followed by a normal period in April; a week later she ha lost for one day; and in May she had had a heavy loss for week, accompanied by pain. She had been sleeping badly fo a month.

Physical examination showed nothing abnormal. Inquirie about worries revealed that she had failed an examinatio twice and was anxious about the third attempt, then nearly due; a further failure she thought would upset her mother, an ill woman, rather badly. Further, she had broken off her e Tween 80 albumin medium. When growth had n. two to three drops were inoculated into a second of the medium. After 8–10 days' incubation at inocula of 0·02 ml. were distributed with a pipette rated to drop 50 drops per ml. to a series of tubes aining streptomycin in concentrations of from to 0·06 units per ml. by twofold steps. A standard n of *Myco. tuberculosis*, H37RV, was maintained on kauer and Beck's medium (Steenken and Gardner), and on each occasion a sensitivity test was done t by the same technique carried out in parallel. lts of the sensitivity tests were read at 10 days and ribed relative to the standard strain. Thus, if the st tube in which growth was completely inhibited ained 0·5 unit per ml. for the standard strain and it per ml. for the strain under test, it was described two times less sensitive than H37RV." For the pose of analysis the results were expressed on a rithmic numerical scale as follows, a difference of on this scale corresponding to one tube up or down he sensitivity test:

	Numerical scale
4 times more sensitive than H37RV	1
2 " " " " "	2
Sensitivity equal to that of H37RV	3
2 times less sensitive than H37RV	4
. . . .	.
. . . .	.
. . . .	.
1024 times less sensitive than H37RV ..	13
2048 " " " " ..	14
More than 2048 times less sensitive than H37RV	15

Subcultures from the original egg slope into Tween 80 lumin medium were usually made as soon as growth became apparent. In view of the possibility that sensitive and resistant organisms might grow at different rates, 67 of the original slopes were sampled immediately growth became apparent, which was at an average 23 days after incubation. They were then eincubated and retested after eight weeks had elapsed ince inoculation.



g. 1—Results of sensitivity tests on 398 strains of *Myco. tuberculosis* resistant to streptomycin.

To obtain an estimate of the errors involved in measurng the degree of sensitivity of resistant strains 55 sputa rom patients who had expectorated resistant strains were ultured in duplicate and sensitivity tests were done n both the strains obtained.

RESULTS

Pre-treatment Strains

Results obtained on strains derived from patients before the start of streptomycin therapy are given in the accompanying table. 14 sputa were each divided into two portions and cultured separately. As can be seen from the analysis of variance, the variation between these duplicates is similar to that between strains obtained at different times from the same patient. Further, the amount of variation between the strains derived from different patients is the same as the amount between the different strains derived from the same patients. Thus it can be concluded that, within the limits of the accuracy of the technique, there is no real difference in the sensitivity of strains derived from different patients.

RESULTS OF SENSITIVITY TESTS DONE ON 205 STRAINS OF *Myco. tuberculosis* DERIVED FROM PATIENTS BEFORE TREATMENT WITH STREPTOMYCIN

	No. of strains
4 times more sensitive than H37RV ..	2
2 " " " " " ..	46
Equally sensitive as H37RV	134
2 times less sensitive than H37RV	22
4 " " " " "	1

ANALYSIS OF VARIANCE

—	Sum of squares	Degrees of freedom	Mean square	F	P
(1) Between patients ..	43·4592	123	0·3533	1·162	0·2
(2) Between strains ..	29·2482	67	0·4365	1·528	0·2–0·1
(3) Between duplicate cultures of the same strain	4·0000	14	0·2857		
(4) Total within patients (2 + 3)	33·2482	81	0·4105		

The mean square derived from the duplicate cultures of the same strain has been used to test the significance of the between-strains mean square. The total within-patients mean square has been used to test the significance of the between-patients mean square.

Resistant Strains

The results of sensitivity tests on 398 strains are given in fig. 1. There appear to be three distinct groups of strains showing a characteristic degree of resistance. In one of these groups they are about four times less sensitive than H37RV. In the second group they are about 128 times less sensitive, and in the third group the strains can grow in at least 1000 units of streptomycin per ml., the highest concentration used.

Among individual patients there is usually a more or less abrupt rise from a strain as sensitive as the pretreatment strain to one or other of these levels of resistance. In most cases once this level has been attained it is maintained throughout treatment. Thus in a group of 12 patients developing a degree of sensitivity four times less than H37RV (a typical example is fig. 2A) only one showed any tendency to develop a higher degree of resistance. In this case (fig. 2B) the initial change in sensitivity occurred at 23 days and the second change, which was abrupt, at 79 days after the beginning of treatment. In the remaining 11 patients the change in sensitivity occurred on the average at 65 days (range

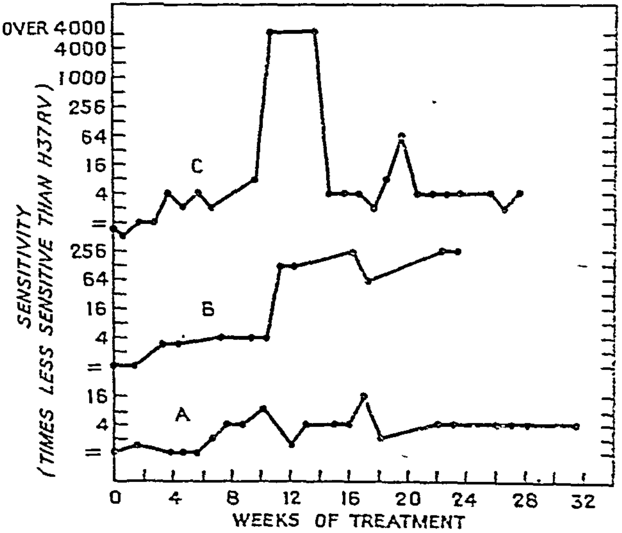


Fig. 2—Results of sensitivity tests to streptomycin done on strains isolated from individual patients: A, typical series of strains developing a degree of sensitivity four times less than H37RV: B, series of strains demonstrating development of resistance in two stages; C, series of strains showing wide fluctuations in the resistance.

secretion, whereas anxiety and resentment were associated with hyperæmia and swelling of the nasal mucosa and increased secretion.

It therefore seems likely that all mucosæ react similarly, and that menorrhagia of emotional origin is brought about by vasodilatation and hyperæmia of the endometrium.

It has been shown in other organs, such as the stomach, that it takes very little to make a hyperæmic mucosa bleed. I suspect that the uterine muscle is slightly irritable and that its contractions may be the final factor in causing the bleeding (see below). The hyperæmia alone may well be the cause in the case of the endometrium.

Admittedly, the menstrual cycle is often shortened, but this is probably due to over-reactivity of the cerebral cortex and consequent disturbance of the hypothalamus, which controls the cycle through the pituitary. What disturbance there is of endocrine function is secondary to this, and curettings do not suggest that an excess of œstrogenic hormone is a factor in the menorrhagia. This theory is supported by the following case of postmenopausal bleeding in which œstrogens can have played little part.

Case 9.—In February, 1946, the patient was 58 and her menopause had taken place exactly two years previously. In November, 1945, bleeding had occurred, profuse at first, and lasting a week; another gynæcologist had done a curettage but found nothing.

When I saw her, there had been further slight bleeding, but all I could find was a small erosion which was hyperæmic and bled at the slightest touch. I applied silver nitrate. Three months later I saw her again for further short spells of bleeding. She also complained of pains in the groins and loss of weight. I found slight bleeding from the cervical canal, and the body of the uterus was slightly tender. I therefore did a diagnostic curettage. I found that both the endometrium and the small erosion bled readily; the mere passage of a sound started free bleeding from the endometrium, but I could remove nothing. The erosion I cauterised.

I had not expected to find anything, for I had discovered that the bleeding occurred in every case on the birthday, or day of death, of one of her sons: all three sons had been killed in the R.A.F., and shortly after that her husband had died. The patient had never recovered from her distress. Latterly she had been busy helping her daughter with her small family and had got rather tired. She is easily agitated and cannot readily express her emotions; she undoubtedly has a labile vasomotor system and flushes very readily. I explained the situation to her and gave some simple advice, and she has had no more trouble.

In this patient there was slight bleeding from an erosion which was hyperæmic. It is reasonable to infer that the endometrium was similarly hyperæmic, and that this was why it bled so readily.

When doing a hysterectomy on women whom I have thought to be a little over-emotional I have several times noted that the uterus flushes and blanches, and flushes again. The endometrium has appeared normal, and I believe I have done hysterectomies where the cause, or at least an important aggravating factor, has been emotional.

Fremont-Smith and Meigs (1948) describe a case of menorrhagia due to emotional factors. They had given intensive endocrine therapy and curetted the woman; both treatments were singularly ineffective. Bleeding finally ceased after three hours' discussion with a psychiatrist, during which care and anxiety were partially relieved. The woman had bled almost continuously for nine months, and two endometrial biopsies during this time showed normal proliferative œstrogen changes in the endometrium. She had been followed up for nine years, and her periods have remained normal during all this time.

It occurs to me that the first recorded case of menorrhagia of emotional origin is to be found in the Gospel according to St. Luke, chapter 8, where it reads: "A woman having an issue of blood twelve years, which had spent all her living upon physicians, neither healed of any, came behind him, and touched the of his garment: and immediately her issue of stanched." No doubt, from her faith, she got mind for the first time for many years. It is how quickly the bleeding can stop, and this think points to a psychogenic control in these cas

SUMMARY

Eight cases of menorrhagia in which the bleedi associated with emotional difficulties, and a case o menopausal bleeding of psychogenic origin are Such menorrhagia is not uncommon, particul young women. It can be cured by simple psy

I wish to thank Prof. W. R. Spurrell for his criticism, and Dr. O'Neill for his interest and help treating two of the cases.

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TESTS FOR STREPTOMYCIN SENSITIVITY OF TUBERCLE BAC IN TWEEN 80 ALBUMIN LIQUID MEDI

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For two years, strains of *Mycobacterium tube* have been tested for their sensitivity to strept in the 'Tween 80' albumin liquid medium de by Dubos and Davis (1946). Results from two of strains are described here, one obtained from p before receiving streptomycin, and the other o after increased resistance to streptomycin had dev

STRAINS OF *Myco. tuberculosis*

All the strains except 2 were obtained from p receiving streptomycin under the auspices of the S mycin in Tuberculosis Trials Committee of the Research Council. 205 strains were obtained fro patients before treatment started. 89 of these p had pulmonary tuberculosis, and 35 miliary or me tuberculosis. 398 strains showing increased res to streptomycin were obtained from 61 patients. 4 of these were obtained from the meninges; t were cultured from sputum, gastric lavages, or la swabs. Cultures were taken at short intervals treatment (usually weekly) from 27 patients pulmonary tuberculosis. Whenever a strain fro of these patients had become more than "two tim sensitive" (see below) to streptomycin than the st strain H37RV it was deemed resistant, and all subs strains obtained from that patient were included the resistant cultures.

METHOD

The method used for determining the sensiti streptomycin has been described by the Patho Subcommittee of the *Streptomycin in Tube* Trials Committee of the Medical Research C (Medical Research Council, 1948). Strains of *tuberculosis* were isolated on egg media, and represen samples of growth were transferred to 3 ml. qua

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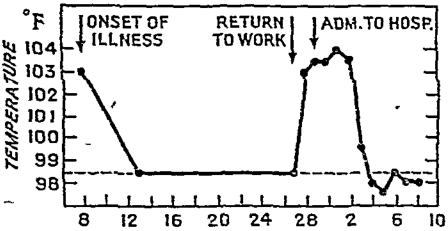
* In receipt of a grant from

Case-report

nan. aged 42, was admitted to Ruchill Hospital on 29, 1948, for investigation of pyrexia of unknown . For twenty years he had been employed as a sheep- in the city abattoir, where he had often been bitten ks and had commonly brushed them off his arms and ıck of his neck.

had been well until three weeks previously (Sept. 8) he was taken suddenly ill with what he described as ıd attack of flu." At that time, he complained of sore t and joint pains. His family doctor found that his ɜrature was 103°F (see figure) and that he had mild hitis and faucial inflammation. This febrile illness ıued for five days. Aspirin and an expectorant cough- ıre were prescribed and the patient seemed to recover letely.

felt well enough to go to work on Sept. 27, but after a ıours went home, complaining of severe headache and asing weakness. On Sept. 28 he again sought his doctor's e, because of intense headache, vomiting, constipation, profuse perspiration. His temperature was 103°F and pulse-rate ermin., but mination ıed no other ırmality. On t. 29 he ıloped slight ıal rigidity, ıt internal bismus, and apular rash he abdomen, l he was ıitted to hos- l for further stigation.



Biphasic pyrexia in a patient with louping-ill.

n hospital the patient complained of bouts of severe fronto- ipital headache and of transient attacks of diplopia. was mentally alert and cooperative. On admission his ıperature was 102°F. He looked ill and had mild photo- bia; he had a malar flush and perspired freely; a few all pink papules were observed on the skin of the abdomen the para-umbilical region. The tongue was heavily furred d there were sordes on the lips; the throat was not lamed. The abdomen was not distended and the liver and een were not enlarged. The respiration-rate was 34 min.; neither cyanosis nor respiratory embarrassment s present, but numerous râles were heard throughout the g fields. The pulse (rate 110 per min.) was of good volume d regular; the blood-pressure was 110/65 mm. Hg. The art was not enlarged and the heart sounds were pure and good quality. Right internal strabismus and slow lateral stagmus were noted, but no other abnormality on full amination of the central nervous system. Ataxia was sent. Ophthalmoscopic and auroscopic examinations also ealed no abnormality.

INVESTIGATIONS

Urine analysis proved negative. Lumbar puncture yielded clear fluid under normal pressure with 120 lymphocytes r c.mm., increased protein, and a normal chloride content e table I). The white blood-cell count was 16,000 per mm. (polymorphs 85%, lymphocytes 12%, monocytes 3%). assermann and colloidal-gold tests were negative. The Widal and the Paul-Bunnell tests, and the Schuffner test for *Leptospira icterohæmorrhagiæ* and *L. canicola*, were all negative. Repeated radiological examinations of the chest showed no evidence of pulmonary disease. Bacteriological examination of fæces and urine for the dysenteric and enteric groups of organisms also proved negative.

TABLE I—CEREBROSPINAL FLUID IN PATIENT WITH LOUPING-ILL MENINGO-ENCEPHALITIS

Date	Character	Pellicle	Lymphocytes per c.mm.	Chlorides mg. per 100 ml.	Sugar mg. per 100 ml.	Protein
Sept. 30	Clear	Nil	120	715	50	Increased
Oct. 2	Opalescent	Nil	320	740	70	Increased
Oct. 11	Clear	Nil	52	720	60	50 mg. per 100 ml.
Oct. 19	Clear	Nil	18	780	60	60 mg. per 100 ml.

TREATMENT AND PROGRESS

Pyrexia (100–104°F) persisted for five days, after which the temperature fell by crisis. Double vision recurred intermittently for three days and then passed off. The nystagmus, too, was transient and disappeared two days after admission. The fronto-occipital headache came in bouts of great severity for four days after admission, but then these stopped as quickly as they had begun. The right internal strabismus recovered as the headaches improved; and all abnormal signs in the central nervous system had disappeared on the fourth day after admission.

Initially, symptomatic treatment was employed, but on Oct. 2, in view of persistent pyrexia and chest signs, a course of sulphadiazine (2 g. four-hourly) and intramuscular penicillin (50,000 units four-hourly) was instituted.

The patient made an uneventful recovery. The chest signs were the most resistant to treatment. Sulphadiazine was discontinued on Oct. 7, but penicillin was administered until Oct. 19, when the chest was pronounced clear, clinically and radiologically. The patient was discharged from hospital on Nov. 29, and resumed his work in the abattoir. On the day of his discharge a sample of blood was dispatched to be examined for the presence of neutralising antibodies against the virus of louping-ill.

SERUM-NEUTRALISATION TESTS

Various dilutions of the virus of louping-ill were mixed with an equal volume of the patient's serum. As controls, similar dilutions of the virus were mixed with normal horse-serum and with another human serum. The results are shown in table II. While the horse-serum and the control human serum showed no activity whatsoever against the virus, the patient's serum was highly active. Given by the intracerebral route it neutralised the virus completely in a dilution of 10^{-6} and retarded infection slightly with other dilutions. When the virus-serum mixture was inoculated intramuscularly there was complete neutralisation of the virus. There is therefore strong presumptive evidence that the recent illness suffered by the patient was louping-ill.

ABLE II—NEUTRALISING ACTIVITY AGAINST LOUPING-ILL VIRUS OF NORMAL HORSE-SERUM AND SERA FROM HUMAN CONTROL AND PATIENT

Dilution of virus	Normal horse-serum		Human control		Patient	
	Intracerebral	Intramuscular	Intracerebral	Intramuscular	Intracerebral	Intramuscular
10^{-3} ..	..	6, 9, 9, 9, 9, 10	..	S, 9, 9, 10, 10, 11	..	S, S, S, S, S, S
10^{-4} ..	5, 5, 5, 5, 5, 5	8, 9, 10, 11, 13, 13	5, 5, 5, 5, 5, 5	8, 9, 10, 10, 11, 12	7, 7, 7, 7, 7, 10	S, S, S, S, S, S
10^{-5} ..	5, 5, 5, 7, 7, 7	9, 9, 11, 12, S, S	5, 5, 5, 5, 5, 5	9, 10, 10, 10, 13, S	7, 7, 7, 8, 8, 10	S, S, S, S, S, S
10^{-6} ..	7, 7, 7, 7, 7, 7	..	7, 7, 7, 7, 7, 7	..	S, S, S, S, S, S	..

Equal parts of serum and of virus in the dilutions stated were mixed and allowed to stand 1 hr. at room-temperature. The mixture was then injected intracerebrally (0·03 ml.) or intramuscularly (0·1 ml.) into mice. The numerals show the survival-period, in days, of individual mice.
S = animal survived.

44–75 days). Treatment was maintained for six months (*in 1 patient for five months*).

In exceptional cases there may be wide fluctuation in the degree of sensitivity of strains obtained after resistance has developed. An example of this is fig. 2c. It will be noted that even here the degree of resistance of any individual strain fell into one or other of the three groups.

The results obtained from duplicate cultures of resistant strains and the results obtained from cultures sampled immediately growth was observed and after eight weeks' incubation were subjected to analysis according to methods given by Kendall (1943). The amount of variation in the sensitivity to streptomycin between duplicate strains of a resistant organism (mean square 0·7105) is larger than that found for the pre-treatment strains (mean square 0·4044). This is to be expected, since the population of bacilli is probably less homogeneous. The inherent error in a sensitivity test on a resistant strain is about one tube up or down in 1 out of every 4 tests. There is no real difference in the degrees of sensitivity obtained from cultures sampled when growth became apparent and after eight weeks' incubation. The mean of sensitivity tests done on resistant cultures sampled immediately was 5·4141, and sampled after eight weeks' incubation 5·2656. The probability of this difference occurring by chance is between 1 in 3 and 1 in 2. There is thus no evidence to suggest that the result of the sensitivity test was influenced by the length of time during which the original primary culture was incubated.

DISCUSSION

The remarkable degree of uniformity in streptomycin sensitivity found among strains of *Myco. tuberculosis* before treatment was started may prove to be of epidemiological value. Any such strain isolated in the future and found to be resistant would suggest that the infection had been transmitted from a patient with tuberculosis who had undergone streptomycin treatment. For this reason it is important that the sensitivity of pre-treatment strains should continue to be tested.

Pyle (1947) has suggested that there are a few streptomycin-resistant bacilli within any predominantly sensitive strain, and that the development of resistance is due to these strains taking the place of the normal population. Yegian and Vanderlinde (1948) estimate resistant variants to be present in a proportion of from 0·36 to 6·0 per 100 thousand million sensitive organisms before treatment. If we accept this view, the occurrence of three groups of resistant strains with characteristic degrees of resistance could be explained by the hypothesis that there are three different types of resistant variants within any pre-treatment population. The proportions in which these might occur and the factors tending to favour the selection of one or other type have not, however, been determined. Further work to provide evidence for this view is in progress.

The occurrence of one group which is, on the average, only about four times less sensitive than the standard strain suggests that, in looking for the development of resistance, at least 2 strains from any patient should be tested. The variation inherent in the technique of testing is such that strains on the average four times less sensitive will often appear only two times less sensitive, whereas a strain on the average as sensitive as the standard strain will often also appear two times less sensitive and on rare occasions even four times less sensitive. The question naturally arises whether these strains showing only a slight degree of resistance are inhibited in their growth by streptomycin concentrations found within the lesion of patients under treatment with streptomycin. Evidence will be presented later that the rate of excretion of tubercle bacilli from patients with pulmonary lesions falls while the strains ar *sensitive and then rises again during the* period strains show this slight degree of resistance.

SUMMARY

205 strains of *Myco. tuberculosis* obtained
treatment with streptomycin were found equally
to streptomycin when tested, in Tween 80
liquid medium.

398 strains showing resistance to streptomycin
into three groups, each showing a characteristic
sensitivity.

The increased resistance of strains belonging to
of the groups, which are on the average only fo
less sensitive than the standard sensitive strain,
be observed unless two or more strains are tested
any one patient.

The length of time during which the primary cu
is incubated does not affect the result of the sensit
test.

The streptomycin used was the hydrochloride (M
Rahway, N. J., U.S.A., batch no. 294) and the cal
chloride complex (Merck, batch no. 1086). A unit
equivalent of one microgramme of the pure base. My t
are due for technical help from Miss R. Weitz, Mrs
Mitchison, and Miss M. Girvan.

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LOUPING-ILL MENINGO-ENCEPHALIT

A FURTHER CASE AND A SEROLOGICAL SURVEY

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FOR many years louping-ill has been recognis
responsible for a considerable mortality in sheep o
farms in the Highlands and Lowlands of Scotland
in the northern counties of England. The infe
which takes the form of a meningo-encephalomy
is due to a filter-passing virus, and the sheep-tick I
ricinus is the natural vector.

In man louping-ill is much less common. Da
et al. (1948), adding 2 cases to the 6 previously reco
pointed out that these 2 were the first in which
disease was recognised as occurring naturally
outside the laboratory. The 2 patients came fr
known louping-ill area in the North of England;
first was a veterinary officer concerned with s
dipping, and the second a farmer. More recently B
et al. (1949) have recorded a case in a shepherd w
flock was known to be heavily infected with loupi
and Edward (1948) has reported 12 more infectio
laboratory workers.

This article records a 4th example of loupi
meningo-encephalitis arising outside the laboratory;
patient was a sheep-killer employed in a Gla
abattoir. In addition we report the results of a serolo
survey undertaken to decide whether there was unr
nised infection among the patient's fellow workers.

s were unsuccessful. Hurst (1936) showed that rimental introduction of the virus of equine encepha- into the body is followed by a phase of systemic iplication and later by the disappearance of the s from the blood and its appearance in the brain cerebrospinal fluid; he believed the course of louping- n animals and man to be similar. Observations in ing with this supposition were made by Edward 8), who recovered the virus in 5 of his cases diagnosed he acute stage, by the intraperitoneal injection of ted samples of blood into mice; and by Brewis his colleagues (1949) who succeeded in isolating the ve agent in cerebrospinal fluid obtained from their ent during the stage of nervous involvement. side the laboratory, cases in the premeningeal stage nfection will seldom be recognised; so recovery of virus from the blood at the onset of the illness is kely. Diagnosis must depend primarily on the recog- on of the nervous symptoms. While these are present, Brewis and his colleagues point out, inoculation of the brospinal fluid intracerebrally and intramuscularly mice is the appropriate diagnostic procedure.

Unfortunately, when arrangements were finally com- ted for experimental investigations in our patient, was too late to attempt isolation of the virus from cerebrospinal fluid. Nevertheless, the circumstances ler which infection took place, and the results of the um-neutralisation tests suggest that the illness was ping-ill. The nervous manifestations which ushered the second febrile phase of the illness were mild d rather indeterminate. Their non-specific character phasises the necessity of laboratory diagnosis in arating this disease from other forms of virus encepha- is giving rise to similar symptoms. Headache, vomiting, d nystagmus were prominent and were associated th strabismus and diplopia. Clinical signs of meningeal itation were absent by the time the patient was mitted to hospital. The characteristic cerebellar axia noted particularly by Brewis and his colleagues as absent. The cytological and biochemical findings the cerebrospinal fluid were similar to those found in her forms of virus meningo-encephalitis.

A retrospective diagnosis of louping-ill in 3 out of of our patient's fellow workers might suggest that e occupational risk of infection is not as great in the ld as in the laboratory, where the workers handle e virus. The number of cases is, however, too small r comparison. Of the 18 reported examples of the sease contracted in the laboratory, some were diagnosed the acute stage while others were brought to light the result of serological surveys. Only 3 cases have een recognised in the field, where, as far as we are ware, no similar surveys have been performed. Macleod 1939) has pointed out that cattle grazing in infected astures readily contract the disease, and pigs and orses are known to be susceptible. It has been thought hat some cases of severe meningitis and encephalitis n man were due to louping-ill; and probably more omprehensive surveys in the louping-ill areas of Scotland ould reveal instances of the infection which, owing to he absence of nervous involvement, pass unrecognised.

With regard to the mode of infection in the laboratory, Edward mentions the possibility of contamination of the air by infected droplets, especially where techniques used in the study of viruses include the mechanical fragmentation of infected animal tissues. Such a method of transmission cannot, however, account for cases among those who simply killed and skinned infected sheep under cover out-of-doors. In the abattoir, where it can be assumed that a proportion of sheep admitted for slaughter are tick-infested, infection was probably conveyed by the bite of an infected tick, although the possibility of the virus gaining entrance to the body by infected material contaminating the skin is perhaps worth considering; as might be expected, many of the employees suffer numerous abrasions and cuts.

Vaccination of susceptible personnel in laboratories has been suggested by Edward; and in 3 volunteers given three doses of a formolised mouse-brain vaccine the development of antibodies in high titre seemed to indicate a high degree of protection. Vaccination, however, is not without risk, and in the field at any rate its employment could not be considered without more information about the incidence and morbidity of louping-ill infection in man.

SUMMARY

A case of louping-ill meningo-encephalitis in an abattoir worker engaged in sheep killing and skinning is reported.

Laboratory diagnosis is important in separating this disease from other forms of virus encephalitis giving rise to similar symptoms.

Sera from 38 of the patient's fellow workers were examined for neutralising antibodies against the virus of louping-ill. Such antibodies were definitely present in 3 cases, and possibly present in a further 3.

Serological surveys in the field would probably bring to light cases which have hitherto escaped detection, thus providing a truer picture of the incidence in man.

For the clinical account of the patient's illness before his admission to hospital we are indebted to Dr. Agnes M. K. Culver who suggested at the outset the possibility of tick infection. Our thanks are also due to Dr. W. M. Elliott, *physician-superintendent*, Ruchill Hospital, *for permission to* publish this case, and to Mr. J. A. Rennie, general manager of markets, Corporation of Glasgow, for facilities at the abattoir.

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VENTRICULAR FIBRILLATION RECORDED TEN HOURS BEFORE DEATH FROM MYOCARDIAL INFARCTION

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Ventricular fibrillation has sometimes been observed and recorded when occurring for short periods and giving rise to syncopal episodes of the Stokes-Adams type (e.g., Schwartz 1936). But electrocardiographic records of the dying heart are, for obvious reasons, less common, and Hamilton and Robertson (1933) claimed that theirs was the first published. Later Smith (1939) recorded a case in which ventricular fibrillation came on nine hours after coronary thrombosis, and Goodrich and Needles (1940) one in which it came on ten days after occlusion. Thompson in 1941 remarked that very few electrocardiograms had been taken at or near the moment of sudden death from angina and coronary occlusion, and that, though such deaths were usually attributed to ventricular fibrillation or ventricular standstill, little direct evidence was available about the terminal cardiac mechanism. I have been unable to trace any examples published in this country. In the case here reported the electrocardiogram was not taken at the moment of death, which occurred suddenly ten hours later; but the unexpected appearance in the record of a short phase of ventricular fibrillation makes it instructive.

The patient was a woman of 67; she was a hypertensive and had complained of breathlessness on exertion for several

Serological Survey

Rivers and Schwentker (1934) applied neutralisation tests to the sera of four laboratory workers suspected of having had louping-ill; tests were also made on the sera of other people working with the virus as well as the sera of those who had no known contact with the virus. The findings showed that close contact with the virus was associated with the appearance in the serum of neutralising antibodies. Of 7 people who had been in contact with the virus, 5 possessed neutralising sera; and of these 5, 3 had had encephalitis, 1 had been sick with an influenza-like illness, and 1 had not been ill at all. Of 46 people who gave no history of contact, 1 had a weakly active serum. Edward (1948) demonstrated complement-fixation antibodies in 7 out of 12 persons previously engaged in louping-ill vaccine production; all except 1 gave a history of febrile illness consistent with louping-ill.

These observations reveal that infection in the laboratory may be brought to light only by serological surveys. No such surveys have as yet been undertaken in the field, and the discovery of the case of louping-ill described above prompted us to investigate the patient's fellow workers at the abattoir, in an effort to detect unrecognised infection contracted in an occupation involving intimate contact with sheep from known louping-ill areas.

METHOD

Of 38 employees who were questioned, all said that they were familiar with the sheep-tick, but on closer inquiry it was suspected that some were confusing *Ixodes ricinus* with a degenerate blood-sucking insect well known to them as the sheep-ked.

The 38 workers fell into three groups according to the nature of their duties: (*a*) 12, engaged solely in sheep killing and skinning, whose period of employment ranged from fifteen to forty years; (*b*) 23 offal workers who were younger, with no more than four or five years' service; and (*c*) 3 men, with a length of service similar to the offal workers', concerned with the disposal of the blood of sheep and cattle. In each group the work involves constant contamination of the skin by the blood and intestinal contents of sheep; and this suggests the possibility—perhaps remote—of direct infection from sheep actually infected at the time of slaughter.

The majority of the men were of a healthy and robust type. Their medical histories disclosed only a few illnesses, such as pneumonia, rheumatism, and gastritis; and with the possible exception of some antecedent attacks of "influenza" there was no history suggesting infection with the virus of louping-ill. There was no instance of meningitis or encephalitis or of any nervous disease involving admission to hospital.

Blood samples from each of the employees were examined for neutralising antibodies against the louping-ill virus. As controls, similar dilutions of the vir mixed with normal horse-serum and with a neutralising serum. The results of clearly posi are recorded in table III. Of the 38 sera, 2 a the virus strongly, a 3rd, though definitely the virus, was less active, while 3 (not shown in were doubtfully active and were perhaps co with the case reported by Rivers and Schwentker when there had never been contact with the Each of these results was confirmed in a second Of the 3 men with definitely positive sera, 2 (A and belonged to the group of 12 sheep killers and and 1 (C) came from the group of 23 offal A's medical history revealed that during his twent years' employment he had twice had pneumonia and "influenza." His fellow worker, B, during his years' service, had twice had rheumatic fever. offal worker, C, had begun work at the abattoir two years previously, and contracted severe twelve months later when he was confined to bed home for fourteen days. The 3 men with active sera were sheep killers and skinners of more twenty years' experience. With the exception of 1 gave a history of having had influenza some y previously, their medical histories were non-contribut There were no positive sera among the handlers sheep's blood.

Discussion

The case reported here, when compared with o descriptions of louping-ill, illustrates the variations in clinical picture. At first there may be only influenza symptoms lasting about five days and clinically unre nisable as those of louping-ill. The initial illness ma followed, as in our patient, by a second pyrexial p (see figure) associated with symptoms of mild or se meningo-encephalitis. The initial influenza-like ill lasting for five days and followed by involvemen the central nervous system after an intervening afe period is clearly illustrated in the case-reports of Ri and Schwentker (1934), Wiebel (1937), Wesemeier (1 Davison et al. (1948), and Brewis et al. (1949). biphasic temperature reaction is a feature of the di in sheep.

The similarity of louping-ill in sheep to poliomy in man has been pointed out by Gordon (1934). poliomyelitis a latent period may divide two pyr phases, resulting in the so-called dromedary tempera chart described by Draper (1917). An initial "illne infection" has also been noted in measles (Goodall 1 and in mumps (Harries and Mitman 1947). In hu louping-ill this phenomenon is probably a constant fea

Rivers and Schwentker (1934) suggested that primary illness represented a systemic infection, a sheep, and that later the virus attacks the ce nervous system; but attempts to demonstrate virus in the blood and cerebrospinal fluid in 2 of

TABLE III—NEUTRALISING ACTIVITY AGAINST LOUPING-ILL VIRUS OF NORMAL HORSE-SERUM, OF SERA FROM T MEN (A–C) EMPLOYED AT ABATTOIR, AND OF KNOWN NEUTRALISING SERUM

Test no.	Dilution of virus	Normal horse-serum	Serum A	Serum B	Serum C	Known neutrali- serum
1	10^{-1}	7, 7, 8, 8, 8, 9	10, 11, 13, S, S, S	S, S, S, S, S, S	S, S, S, S, S, S	S, S, S, S, S,
	10^{-3}	8, 9, 9, 9, 9, 9	S, S, S, S, S, S	S, S, S, S, S, S	S, S, S, S, S, S	S, S, S, S, S,
	10^{-4}	9, 10, 10, 11, 12, S	..	..	..	..
2	10^{-1}	7, 7, 7, 8, 9, 9	9, 12, 12, 14, 16, 16	S, S, S, S, S, S	S, S, S, S, S, S	S, S, S, S, S,
	10^{-3}	9, 9, 11, 11, 12, 13	S, S, S, S, S, S	S, S, S, S, S, S	S, S, S, S, S, S	S, S, S, S, S,
	10^{-4}	10, 10, 11, 11, S, S	..	..	..	..

Equal parts of serum and of virus in the dilutions stated were mixed and allowed to stand 1 hr. at room-temperature. They then injected intramuscularly (0·1 ml.) into mice. The numerals show the survival-period in days, of individual mice. S = animal survived.

hich 11,000 were neutrophils. The blood-sedimentation was 63 mm. in one hour (Westergren). As the diagnosis ed to be lobar pneumonia and as there had been no onse to sulphonamides, she was put on to treatment penicillin, 100,000 units eight-hourly. By June 12 was no improvement in the fever and the physical pointed to a right-sided pleural effusion. On June 13 right pleura was aspirated and 10 ml. of dark yellow, tly turbid fluid was obtained. Microscopy showed large bers of pus cells, but because she was on penicillin tment no culture was asked for.

e continued to deteriorate, and on June 15 about 400 of bloodstained fluid was aspirated with some difficulty the right pleura. No culture was made, for the same on as before. On June 16 further X-ray films showed fluid levels at the posterior aspect of the right lower The white-cell count was 13,000 per c.mm., of which 00 were neutrophils. On June 17 she began diarrhœa. June 18 a third chest aspiration was performed and ml. of bloodstained fluid was obtained; microscopy wed autolysed pus cells. Again, unfortunately no culture made.

n June 25 penicillin treatment was stopped. On e 26 radiography showed no change from that of e 16. A blood-count showed hæmoglobin 79% and te cells 10,000, of which 9000 were neutrophils. The blood-imentation rate was 80 mm. in one hour. The patient's eral condition had sadly deteriorated and her appearance gested that death would take place in a matter of weeks, not days. On July 2 the right pleura was aspirated for fourth time and 5 ml. of thick bloodstained pus was tained, from which *S. oranienburg* was grown. On July 4 empyema was drained by a rib-resection by Mr. D. C. rry. On July 5 a urinary culture showed only a slight wth of *Bacterium coli*. On July 6, penicillin, 100,000 its eight-hourly, was resumed. On July 8 *S. oranienburg* s grown from the stools. On July 9 a blood-culture was rile. Thereafter, the patient's general condition improved.

On July 15 a blood-count showed hæmoglobin 82% and ite cells 10,000 per c.mm., of which 7000 were neutrophils. e blood-sedimentation rate was 85 mm. in one hour. pleurogram showed a cavity still containing pus, but the ng itself was more translucent. On July 19 penicillin eatment was stopped, and the patient allowed up from d for the first time. On Aug. 7 another pleurogram owed a much smaller cavity, but a bronchopleural fistula. he returned home on Aug. 19.

On Aug. 20 *S. oranienburg* was again isolated from the eces. Further radiography on Sept. 20 showed that the ronchopleural fistula was still present. The drainage tube as removed on Dec. 15, and the chest sinus healed a week ter. The last stool-culture positive for *S. oranienburg* as on Aug. 20, and the first negative culture on Dec. 15. y May, 1948, the patient was perfectly well, and leading an ctive life.

BACTERIOLOGICAL INVESTIGATIONS

Fæces.—June 7: rectal swab sterile. (The specimen was nsuitable for isolation of pathogens, so the negative result s unreliable.) July 8 and Aug. 20: *S. oranienburg* isolated. Dec. 15: no pathogens isolated.

Pleural fluid.—June 13 and 19: examined for cells only; not cultured. July 2 and Aug. 7: *S. oranienburg* isolated.

Blood.—July 9: culture sterile.

Urine.—July 5: *Bact. coli* isolated.

The salmonella isolated from the fæces and from the pleural fluid was identified by Dr. Joan Taylor, of the Salmonella Reference Laboratory, as *S. oranienburg*. The antigenic constitution was: O = VI . VII

H = m t . . .

The patient's serum on July 9 agglutinated her own organism to the following titre: H, 1 : 1600; O, 1 : 20. The stock strain of *S. oranienburg* was agglutinated to the same titre.

COMMENT

This case is reported firstly because of the unusual infecting agent, and secondly to remind physicians of the occasionally invasive habits of salmonella organisms and that diarrhœa complicating pneumonia requires bacteriological investigation.

In the patient described, treatment with sulphonamides and penicillin was entirely without effect, and the turning-point of the illness was drainage of the empyema. Assuming that *S. oranienburg* was the infecting agent at the beginning of the illness, the organism persisted in the body for at least 82 days, a matter of importance in an ambulant patient.

We wish to record our thanks to Mr. R. L. Vollum, D.PHIL., and Dr. Joan Taylor for the bacteriological observations.

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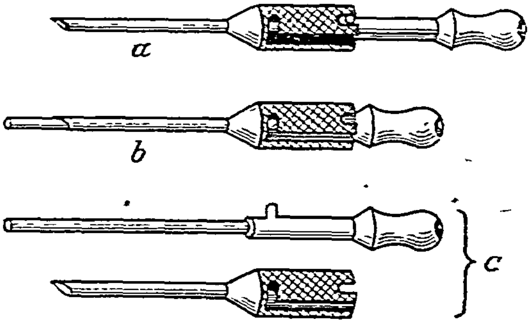
New Inventions

COMBINED INTRAVENOUS CANNULA AND NEEDLE

WHEN a standard blood-giving set is used for intravenous therapy, if the patient makes a sudden movement the needle may pierce the wall of the vein. This results in a hæmatoma in the arm and the needle must be reinserted. An accident of this kind is fairly common when one of the antecubital veins is chosen for the transfusion.

The instrument illustrated below consists of an inner cannula, which is attached to a standard giving set, and an outer needle which acts as a trocar. The needle is attached to a long mount provided with a groove in which a projection on the cannula slides up or down as desired.

The needle is inserted into the vein as in *a* in the accompanying figure. Directly the vein wall is pierced, the cannula is pushed down the groove of the needle until it occupies the position shown in *b*. A lock at the end of the groove and at the top of the mount prevents the cannula or needle from slipping. The cannula and needle can now be pushed well into the vein without damaging its wall, because the end of the cannula projects beyond the sharp point of the needle. The cannula and needle are shown separately in *c*.



This instrument is much easier to insert into a difficult vein than the usual intravenous needle. It also has the following advantages over the other instruments described,[1] in which the needle is inside the cannula:

(1) A syringe is not necessary for introduction into a vein.

(2) After insertion into a vein the needle is not withdrawn.

(3) The needle and cannula can be inserted into a vein with the intravenous apparatus attached.

The instrument has been made to my specification by the Endoscopic Instrument Co. Ltd., Fitzroy Road, Chalk Farm, London, N.W.1., and I would like to thank Mr. F. T. Lowerie for his help in its design and making.

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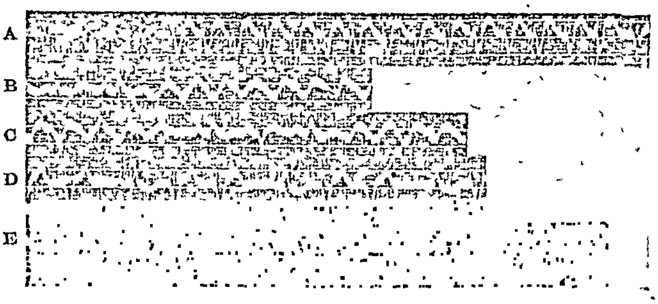
[1] Guest, A. *Brit. med. J.* 1941, ii, 878. Clain, A. *Lancet*, 1947 ii, 830. Waelsch, J. H. *Brit. med. J.* 1948, i, 897.

years, with occasional mild anginal pain. For two or three months dyspnœa had been increasing, until it was present at rest and she developed slight œdema of the ankles. Anginal pain became more frequent and severe, and finally her capacity for exertion was reduced to zero. Her medical attendant states that, when he first saw her on Nov. 15, 1947, she showed signs of early congestive failure, and anginal pain occurred after "walking a few steps." The blood-pressure was 240/120 and arteriosclerotic changes were present in the optic fundi. She was put to bed, but anginal attacks, relieved by trinitrin, continued even at rest. On Nov. 26 she had a severe attack of chest pain lasting an hour, which subsided after a dose of morphine, and during the next few days she was thought to have improved slightly. On Dec. 9 her blood-pressure had fallen to 150/110, and on Dec. 14, she had another attack of severe chest pain all day, which again subsided when she was given morphine. No further incidents occurred till Dec. 26, when dyspnœa greatly increased, the pulse-rate was 140 and "was halved by increasing pressure on the cuff." She was admitted to hospital on Dec. 30, 1947.

On admission she was in advanced congestive failure; the blood-pressure was 150/100, the apex-beat was 6 in. from the midline, and the pulse-rate was continually varying from about 110, when it was quite irregular, to 200, when it was regular. The periods at the slower irregular rate lasted only a few seconds and were repeated about every half-minute. No added sounds were heard. The patient was cyanosed and orthopnœic, but distress was not extreme, and she could converse for short periods.



Electrocardiogram: A, lead I; B, C, lead II; D, lead III; E, lead IV.

Electrocardiogram.—At 3 p.m. on the day of admission an electrocardiogram was taken (see figure). All the strips were taken on a single occasion within the course of a few minutes. Lead I (A) shows a phase of ventricular tachycardia following and ending in normal rhythm. Lead II (B) shows the beginning of a phase of ventricular fibrillation; (C) shows two phases of ventricular fibrillation with interspersed normal cycles and an oppositely directed ventricular complex. Lead III (D) shows each normal beat followed by paired ectopic ventricular beats. Lead IV, apex (E) shows two phases of ventricular tachycardia with intervening normal and ectopic beats. The normal beats show elevation of the S.T. segment and a small or absent R-wave, evidence of myocardial infarction. (No digitalis or allied drug had been given before electrocardiography.) The patient died suddenly ten hours later.

Necropsy.—A small pericardial effusion was found; the heart was greatly enlarged and showed an area of infarction on the anterior aspect of the left ventricle about $2^1/_2$ in. in diameter, involving almost the whole thickness of the wall. There was gross narrowing and atheromatous change in the coronary arteries, but no thrombus was found.

In this case electrocardiography confirmed the diagnosis of myocardial infarction and revealed ventricular tachycardia and ventricular fibrillation. The patient survived ten hours after this was first observed.

I am indebted to Dr. W. B. Wallace for details of the patient's condition before admission to hospital.

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PNEUMONIA AND EMPYEMA DUE SALMONELLA ORANIENBURG

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In the enteric group of fevers complications affe the respiratory system are well recognised. A 25 per cent. of typhoid patients have bronchitis at time in the illness (Reimann 1938). Bronchitis, pleu empyema, lung abscess, and osteochondritis of the have all been recorded (Minor and White 1946).

Similar complications in patients with other salmo infections are less common. Seligmann, Saphra, Wassermann (1943, 1946) found 26 respiratory comp tions in 3000 cases of salmonella infection. Respir *infections, ranging from a mild pharyngitis to pneum* with septicæmia have been recorded from *Salmo choleræ-suis*, *S. enteritidis*, *S. kentucky*, *S. new S. typhi-murium*, *S. dublin*, and *S. oranienburg* (S 1934, Harvey 1937, Seligmann et al. 1943, 1946, and White 1946). Of these organisms, *S. cholera* is the most invasive, the most likely to produce monia, and the most dangerous. Harvey (1937) rec among 71 patients suffering from *S. choleræ-suis* infec 24 instances of pneumonia, with 10 deaths. *S. oranie* has been implicated as a cause of pneumonia in recorded instances (Kerrin, Elder, and Smith Jager and Lamb 1943, Seligmann et al. 1943 (one 1946 (two cases)).

This organism also sometimes invades other o and tissues outside the alimentary tract. It has grown from the blood by Jager and Lamb (1943), C (1944), and Partington and Cooper (1948), from gall-bladder or bile by Levine (1942) and Selig et al. (1943), and from the meninges by Seligmann (1943) and Hollis and Barron (1944). It has also found in the appendix and an abscess of the bu by Seligmann et al. (1943).

The following case-report describes a patient had a severe and indeed nearly fatal illness fro *oranienburg* infection of [illegible] tract. indicates some of the [illegible] treatment of the condition.

CASE-REPORT

The patient was a married woman aged 65, livi extremely good economic circumstances and hygienic roundings. She had had no serious illnesses, but had al been liable to minor respiratory infections. No-one el the household had been ill for a matter of months b the patient's illness.

She had returned from a holiday in Switzerland a few before the onset of malaise and cough on May 30, There was diarrhœa for one day, and one sweat. On J she was found to have a temperature of 102·5°F, an subsequent record showed a remittent fever. Her complaint was of fatigue. She was given sulphamera 13 g., over a period of three and a half days with no app effect. In the absence of abnormal physical signs no diag was made, but in view of subsequent events it is of int that the type of fever and her general appearance ca the question of enteric fever to be raised on June 4.

On June 7 she had troublesome cough, followed by at the right lung base. Bacteriological examination rectal swab was negative. On June 8 she complaine right shoulder-tip pain, and physical examination sh signs suggestive of right basal pneumonia. On this also she passed a loose stool.

She was admitted to the Acland Nursing Home, Ox and on June 9 the diagnosis of pneumonia was confir by X rays. The white-cell count was 14,000 per c.

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Reviews of Books

Iron Metabolism and its Clinical Significance

A. VANNOTTI, M.D., director of the medical policlinic and professor of internal medicine, University of Lausanne; A. DELACHAUX, M.D., reader in the policlinic. Translated by E. PULAY, M.D. London: Frederick Muller. 1949. Pp. 267. 32*s*.

DESPITE the brilliant isolation of "B12" and the recognition of cobalt and other trace elements as indispensable to life, iron remains in the centre of the stage so far as mammalian respiration is concerned. Its absorption, transportation, and excretion, its two forms of oxidation, and its multiple rôles in cellular metabolism are none of them fully understood, and any thoughtful review of the subject must be reckoned as a valuable contribution to our knowledge of metabolism. This Swiss book has an outlook not limited by our own horizons of language and approach. After reviewing the absorption, excretion, and storage of iron and the various forms in which it occurs in the body, the authors discuss their own findings in a study of the various fractions of serum iron and the non-hæmoglobin iron in the other parts of the body. They separate the serum iron into four fractions, which (they are careful to point out) were not necessarily present as four different chemical compounds in the circulating plasma but which nevertheless undergo considerable individual variation under different physiological and pathological conditions. The methods of separation are given and the relation of each fraction to previous findings is considered in some detail. There are also many experimental data which cannot be summarised, having been acquired by a study of normal men and women at low and high altitudes, patients with anæmia, liver disease, and many other pathological conditions, and experiments on animals.

The book contains 11 diagrams and a considerable number of tables. The bibliography is satisfactory but not exhaustive, and there is a subject and author index. Being clinicians at heart, Professor Vannotti and Dr. Delachaux end with a chapter on the practical aspects of iron therapy; but their book will probably be of more value to the investigator than to the practising physician. The text has probably lost something by translation, for some of the sentences are long and involved, and the sense is not always crystal clear. The translation of a book of this size, however, from German into modern scientific English was a task which few would have been able to undertake, and Dr. Pulay is to be congratulated rather than criticised for his labours.

Red Cross and St. John War Organisation 1939-47

P. G. CAMBRAY; G. G. B. BRIGGS. 1949. Pp. 723.

The Red Cross and the White

A short history of the Joint War Organisation of the British Red Cross Society and the Order of St. John of Jerusalem during the War 1939–1945. HILARY ST. GEORGE SAUNDERS. London: Hollis & Carter. 1949. Pp. 195. 8*s*. 6*d*.

"Almost everything that a prisoner in Axis hands ate and everything he read and wore had to be provided through Geneva." This remarkable statement is the key to the story that Mr. St. George Saunders tells in his short history, and is one of the best justifications for the perpetual neutrality of Switzerland. His book is an epitome, which anyone may purchase, of the larger reference work, by Mr. Cambray and Mr. Briggs, which is not on sale. On Sept. 2, 1939, a formal agreement was reached between the British Red Cross Society and the Order of St. John of Jerusalem to establish a Joint War Organisation to carry out, in collaboration, their relief work during the coming war. The reference volume records, in considerable detail, the amazingly widespread activities of this joint body. The careful record that had been left of their joint work during the 1914–18 war enabled the organisation to start, to a great extent, fully prepared. The original design of the Red Cross, to ameliorate the conditions of the wounded and sick in the field and to ensure for prisoners of reasonable treatment, was never lost to view, and book shows to what extent under conditions of warfare these principles can be applied.

For all prisoners life would have been grim if it not been for the food and clothing sent them under auspices of this organisation; but it is in such things the care and training of the blinded, and the provi of occupational therapy, the arrangements for send seeds of vegetables and other plants to prisoners th the organisation's wide conception of humanity recognised. Over a quarter of a million books were supplied to prisoners, and over 100 allowed their examinations to be conducted in p of-war camps. The care of the prisoner began was first notified as captured, and did not end until was safely repatriated. This did not apply only members of the Armed Forces: civilians who we interned in camps, or who were "detained" in remot villages, under a form of "house arrest," came und the care of the organisation. The value of the voyages of the *Vega*, loaded with necessities, from Lisbo to the Channel Islands, cannot be overestimated. home the organisation took a prominent part in supplyi staff for Civil Defence, and in all activities resulting fro air-raids—evacuation, shelters, rest-homes, and the li In collaboration with the Ministry of Health it establish a series of residential nurseries over the country.

After the end of the war the Joint Organisation d much in the camp at Belsen, and gave help to t hordes of displaced persons, and to the Germans, s shocked and despairing after their collapse. The work the International Committee, composed entirely of Sw is well explained, and the policy of building up l stores in Geneva is seen to have been fully justifie

Both books show what a large part can still be play by voluntary effort in a total war, and many will rec that the work of these two great and similar bod should not be united also in times of peace.

The Mental and Physical Effects of Pain

(Buckston Browne Prize Essay, Harveian Society, London, 1948.) V. C. MEDVEI, M.D., M.R.C.P., associa chief assistant, endocrine clinic, St. Bartholome *Hospital, London.* Edinburgh: E. & S. Living-to 1949. Pp. 59. 3*s*.

THE study of pain is in the forefront of present-d medicine, and much detailed experimental and clini work on it has been done. Original accounts of t subject as a whole have been rare, however, and those pu lished are in the main summaries of the authors' person fields of experience. In 1948, the Harveian Society London set "The mental and physical effects of pain as the subject for the Buckston Browne prize ess The prize-winning essay appears in this booklet wi only slight modifications. Although a few person clinical observations are given, Dr. Medvei's chi concern has been to offer a critical survey of our prese knowledge. His success is well attested by t award.

Blakiston's New Gould Medical Dictionary (Ph adelphia and Toronto: Blakiston. 1949. Pp. 1294. $8 50 —*Gould's Medical Dictionary*, after reaching five editions fifteen years, has changed its title and editors, the new edit being Dr. Harold Wellington Jones, Prof. Normand L. Ho and Mr. Arthur Osol, PH.D. This work, they say, thou based on its predecessor, is a completely new reference boo and it is certainly impressive, with clear type and first cl illustrations, many of them in colour.

Textbook of Surgical Pathology (6th ed. Londo J. & A. Churchill. 1949. Pp. 726. 45*s*.).—The new editi of this good book by Prof. C. F. W. Illingworth and Dr. Bru M. Dick has been generally revised. The sections on thromb phlebitis, brachial neuritis, sciatica, peptic ulcer, splen anæmia, and intestinal obstruction have been rewritten, an fresh matter includes descriptions of vascular hypertensio causalgia, and tumours of muscles. A new chapter has be added on diseases of the pericardium, heart, and great vesse The illustrations too have been revised and augmented, b the book has kept its original convenient size.

THE LANCET

LONDON: SATURDAY, OCT. 15, 1949

R. H. B. (49) 132

SLOWLY but steadily the regional hospital boards working their way through the task of coördinating l reorganising the hospitals into a coherent service. ich time and effort have been required for the uping of hospitals into administrative units, the mation of management committees, the survey of st function and future need. and the assessment and ssessment of status for the professional staff. ence it is not surprising that few final decisions ve yet been taken or authoritative statements made the functions and establishments of individual spitals. But if authority has been silent, rumour is been commensurately noisy in proclaiming far-aching changes for all. Special hospitals of long pute are to be swallowed by some neighbouring viathan; full-time staff are to be recruited for ospitals hitherto well served by part-timers: the eneral practitioner is to be excluded from all association with his hospital: and the cottage hospital is o vanish from the land. So run the rumours. Not ll are believed; not all are true; but there is enough ruth in them to justify discontent and anxiety.

Into this troubled arena the Minister of Health as now stepped. His circular letter (R.H.B. [49] 132). hich we publish in full on p. 711, is a document of ignal importance, stating principles that boards hould bear in mind when considering changes in he use of hospitals. Happily. few irrevocable changes have yet been made and the boards will still be ble to review their hospital policy in the light of hese new recommendations. The emphasis now is n the need to avoid loss of service to patients or nnecessary disturbance of medical staff. The value f local loyalty to the local hospital should not be verlooked in weighing the advantages of reorganisaion, and proposed alterations should be discussed with the people most concerned. In particular the Minister examines the disadvantages to be expected from radical changes in the staffing or function of ottage hospitals and the like, where beds have been n the care of general practitioners. Admitting that n the past some of these hospitals have done work for which they were unsuited, and agreeing that the present opportunity should be taken for associating visiting consultants with them, he nevertheless sees a continuing need for hospitals "to which the general practitioners of the neighbourhood can admit patients who require treatment within the scope of a general practitioner but who, for various good reasons, cannot be treated at home."

> "It is, in the Minister's view, very valuable for the general practitioner service of the district when the family doctor has access to beds where patients of this type can be in his charge. and he knows he can readily call upon the services of a consultant for a second opinion, and it is essential if the level of general practitioner medicine is to be maintained that the interchange of ideas between general practitioners and specialists should be facilitated by such consultation and by informal contacts on the occasion of regular visits from consultants to general practitioner hospitals."

So high does the Minister rate these needs that he suggests that in places where cottage-hospital beds now have to be put to other special use—"e.g., as a maternity unit. a recovery hospital, or a geriatric unit"—other beds in the district (perhaps in a "general practitioner wing" of the district hospital) should be placed in the local practitioners' charge. In view of the known tendency of many of the regional boards to staff the smaller maternity units entirely from hospital obstetric departments, it is heartening, too, to note his insistence that general-practitioner obstetricians should still be given the charge of maternity beds, with the obstetric resources of a larger hospital at their back. As a supplementary means of associating the general practitioner with the work of the hospitals, the Minister recommends the creation of clinical assistantships tenable by general practitioners, in which they could become part of a team in the district general hospital. But there would probably not be very many appointments of this type, and they should not, in the Minister's view. be regarded as a substitute for putting beds at the general practitioner's disposal.

Obviously it will be impossible for boards to apply in every type of area the policies outlined in this memorandum. In industrial and urban areas served chiefly by large hospitals which already have an ample establishment of resident and visiting staff, the provision of general-practitioner wings will be resisted and retarded. (Actually, until the size of practices in such areas is reduced, few practitioners will have much time to give to the care of their patients in hospital.) But in the smaller towns, and in the countryside, the situation is quite different, and doctors here will particularly welcome the Minister's plea that their association with their hospitals should not be unnecessarily disturbed. Eventually, we believe, the regional boards will themselves look back on this circular with approval. They are now responsible for providing a specialist service that will almost everywhere need extension; yet few of their hospitals which are remote from cities or university centres have ever had enough staff of full consultant status to meet the needs of their patients adequately. With growing demands, particularly for outpatient and domiciliary consultation, the boards are almost sure to find many gaps to fill, even when they have made use of all the consultant talent available in their areas. These gaps cannot all be filled satisfactorily by men of registrar grade, partly because these men—the consultants of the future—should have their training mainly in centres where they can work under and learn from the best teachers, and partly because to multiply registrarships out of all proportion to the numbers of full consultant posts eventually available would be unjust and shortsighted. In these outer areas much of the consultant work in hospital and home has been done in the past by men who were also in general practice. The Minister's circular, coming at this time. may encourage boards to make

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1939, except that the manufacturers' applications ow dealt with quickly by correspondence instead the necessarily infrequent meetings of a large of experts. The complaint, which GREEN[5] tions, that official clinical trials involved a great of delay, has thus been largely met. This was reason why the T.T.C. was allowed to lapse; her was that even before the war the committee become impracticably large, and it would have to be bigger still to deal with the rapidly expanding of modern therapeutics.

o submit all new drugs which pass their "preical" tests to an officially supervised, fully conled clinical trial before they are put on the market o doubt an unattainable ideal. Moreover, statistical of, if it is obtainable at all, often requires years bservation; and, as LEAKE and others[6] pointed it is as wrong to postpone the use of a promising edy as to apply untried agents prematurely. So re will always be some new remedies whose general ease is justified on pharmacological or other grounds ich would not satisfy the statistician. The Medical search Council's aim is to organise tests of a tentially valuable new drug (or an old drug in a w application) whenever this seems to be in the blic interest, whether or not the manufacturer has ked for them. Only a small proportion of the drugs ued are judged worthy by this criterion, and it is official body's business to scrutinise the remainder. ould it not be a great help to the practising doctor there was something on the lines of *New and on-Official Remedies* over here with a M.R.C. comittee to approve or disapprove of any new drug, owever uninteresting, on the evidence submitted by e makers? The N.H.S. provides a good reason r such an innovation.

Lessons from Plaster

TETANUS still arises in the classical way, from wound contaminated with infected soil; but in ost of the cases reported nowadays from all parts f the world the sources of infection would have een thought bizarre fifty years ago. KOCH incriminated the surgeon's catgut as long ago as 1898,[7] nd since then low-grade cotton-wool (used as padding or splints),[8] woodwool (in gynæcological pads), and ther ineffectually sterilised dressing materials[9] have een shown to harbour *Cl. tetani*. The latest example s in Canada,[10] where the application of a plaster cast fter arthrodesis of a tuberculous knee was followed y fatal tetanus. *Cl. tetani* and *Cl. welchii* were ecovered from the operation wound at necropsy and rom an unused plaster bandage of the same make as hat used by the surgeon; no tests are reported on he other dressing materials. A coöperative inquiry by other hospitals and the Department of National Health and Welfare at Ottawa showed that plaster bandages from fourteen manufacturers rarely contained *Cl. tetani* but were almost invariably contaminated with other clostridia, especially *Cl. welchii*. War experience with tetanus toxoid has shown that more nearly perhaps than can be said of any other disease, deaths from tetanus are avoidable.[11] But a disease which kills on an average only 6 persons per million per annum in this country is not going to excite a very vigorous campaign for active immunisation in peace-time. The alternative—the sterilisation of all materials likely to contaminate an open wound —presents the classical difficulties associated with the destruction of a spore-forming micro-organism. Dressings and bandages can be, and almost always are, sterilised successfully in the autoclave, but the water vapour is ruinous to plaster-of-paris. Dry heat, which is seldom a satisfactory substitute, if it is to sterilise a rolled bandage right through must reach such a temperature for such a period that it is likely to char the fabric. Exhaustive trials by the Canadian workers suggest that a temperature of 190°C for 90 minutes kills all clostridial spores, but some plaster bandages were rendered useless in the process. No doubt the makers of these products will carry the investigation further. No attempt was made, it seems, to discover whether the clostridia entered the finished bandage in the plaster or in the fibrous matrix; paper, which is commonly used as a matrix, seems the most likely source. It should not be impossible to sterilise both plaster and matrix before incorporation in the bandage, and reasonably aseptic methods of manufacture and an occlusive packing should then avoid extraneous contamination. The indignant surgeon will ask why, if his plaster bandages so commonly contain clostridia, his wards are not teeming with cases of gas-gangrene and tetanus. One of the lessons of war surgery was that even rather crude bacteriological methods show clostridia in many—say five—times the number of wounds which develop clinical gas-gangrene. These organisms are what the rock gardener would call "miffy subjects," and unless the soil is exactly to their taste they will not multiply. One of the objects of the full exposure of traumatic injuries has been the conversion of a deep wound, fertile ground for clostridial growth, to a superficial one in which these organisms do not flourish. Debridement has much in common with the use of the hoe.

The disturbing feature of mishaps such as this is that contamination is not suspected until it has caused serious infection. Eternal vigilance in the preservation of asepsis is the only way to prevent occasional disasters. But chinks in the armour of asepsis are still to be seen in the practice of nearly every hospital. Untold and often unappreciated labour is expended by manufacturers and pharmacists to ensure the sterility of fluids for parenteral administration, and great care is devoted to the production of "pyrogen-free" water; yet in spite of explicit warnings the bowl of "sterile" water still stands uncovered in the operating-theatre. Dressings for ward and theatre are made up in any convenient corner and put in a drum; the drum is sent to be sterilised and on its return is assumed to be free of infection. In how many hospitals are the sterilisers inspected by a responsible officer; how many use "tubes témoins" among the dressings; how many check the purity of the water used in the theatre? In 1945 the Medical Research Council published an more use of the tried services of these men, and at the same time to create posts where, as clinical assistants, a new generation of general practitioners can find opportunity to take their share of hospital duty. If in addition the circular leads to general practitioners being given a better chance to care for some of their patients in hospital with proper diagnostic and nursing help it may mark a turning-point in the history of the National Health Service—the first practical step towards that restoration and reorientation of general practice which should now be one of our principal aims.

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Therapeutic Trials

THAT judgment is difficult and experience fallible is a piece of wisdom familiar enough. Yet most of us turn a blind eye to this axiom when examining the claims for new drugs, whether these take the form of a paper reporting "significant results" or are made in the more fulsome statements that litter the doctor's breakfast table. The National Health Service has been in operation for over a year, and appropriate committees are beginning to discuss some of the consequences of this uncritical attitude. Cramping restrictions officially imposed on prescribing would be highly undesirable, but such restrictions are invited by the casual prescribing of expensive remedies of doubtful therapeutic advantage. An instance is the use of blunderbuss anti-anæmia remedies, the comparative costs of which in the U.S.A. have been discussed by WINTROBE.[1] But whether a doctor should adopt a new drug or new preparation is a question involving far more than the saving of N.H.S. funds; the answer will often determine the patient's chances of recovery.

Large numbers of new drugs appear on the market; how is the practitioner to know whether they are all they are said to be? Have satisfactory trials been made? Sometimes the answer is clearly Yes, but often it is equally clearly No. As long ago as 1905 the American Medical Association founded its Council on Pharmacy and Chemistry to examine the claims made for therapeutic agents; and SOLLMAN,[2] in 1913, reviewing its work, spoke of the difficulty which even "the trained scientific worker may find in distinguishing truth from falsehood, much more so the general practitioner." This is still truer today, when the practitioner may be assailed with specialised information (e.g., in biochemistry and hæmatology) which, if assiduously reiterated, is bound to impress him, whether it is sound or not. Nobody wants to discourage the commercial research which has produced many of the most useful drugs introduced in the last thirty years, but this research might well be stimulated by more planned trials of promising drugs. The arrangement of a satisfactory clinical trial is never easy and may be very difficult. The efficient scheme proposed by VAN WINKLE and others[3] for large-scale investigations has been criticised as too exacting; but its critics agreed on the need for a clear and as far as possible foolproof trial. At present, however, much of the clinical testing of drugs is done by clinicians at the request of the manufacturers arrangement suits the parties immediately for the clinician is glad to make observations publish, and the manufacturer brings a product to the notice of the profession with least possible delay. Much valuable work is this way; *and where, as often, the trials are* by experienced observers, there is no serious for criticism. On the other hand, it is obvious inadequate trials plus enthusiastic advocacy by makers sometimes lead to the uncritical of drugs by many of our profession, who have time to study the evidence in detail even if it objectively presented to them. They can trust in manufacturers who have proved in the past, regretting, perhaps, that so few of trials bear the hall-mark of the *Medical* Council or other unbiased body.

The official mechanisms for the trial of new differ considerably in the U.S.A. and in The A.M.A.'s Council on Pharmacy and whose expert members work voluntarily, with full-time secretary, admits "acceptable" products its *New and Non-Official Remedies* after assessing evidence submitted by the makers and others making inquiries of its own. The whole process take 6–10 weeks, or less in an emergency. does not signify approval, but it does imply that drug has conformed to the council's standards *has genuine therapeutic merits.* Since 1946 the council has had its own *therapeutic* trials committee, responsible for organising impartial clinical trials, especially of new drugs[4]; this committee does not direct the methods to be followed but insists on certain conditions being complied with and may offer advice, and it reviews the work done before publication. In Britain the official supervision of clinical trials is a task of the Medical Research Council. Its standing Therapeutic Trials Committee, founded in 1931, has not been reconstituted since the war, and the council now follows three different procedures for different classes of trial:

1. For products of great potential value, such as penicillin or streptomycin, the council appoints a *special committee* of specialists, including a statistician, to organise tests on its behalf.

2. Alternatively, an *informal conference* may be called to plan tests and meet at various stages of their progress. Unlike that of the special committee, the membership of the conference may vary, so that anyone whose advice would help at a particular stage of the inquiry may be invited to attend.

3. When manufacturers apply to the council for clinical tests of a new product they are asked to provide particulars, including the chemical formula where this is known, and details of the pharmacological and toxicity tests on which the expectations of its therapeutic usefulness are based. These particulars are then sent to *expert referees,* who themselves carry out or direct clinical tests of the product if they are sufficiently impressed with its possibilities. The investigators' findings are shown confidentially to the manufacturers before being submitted to a journal for publication as "A Report to the Medical Research Council." Of the dozen or so definite applications for trials received every year, the council deals with about half in this way.

The third procedure closely resembles that followed by the Therapeutic Trials Committee between 1931 solved, even in America. Messages there are given, newer hospitals, by loudspeakers near the nurses' m, and there are often telephones between nurse patient.

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[1] Wintrobe, M. M. Clinical Hematology. Philadelphia and London, 1942; p. 228.
[2] Sollman, T. *J. Amer. med. Ass.* 1913, 61, 5.
[3] Van Winkle, W. jun., Herwick, R. P., Calvey, H. O., Smith, A. E. *Ibid*, 1944, 126, 958.
[4] *J. Amer. med. Ass.* 1946, 131, 596.

. Ward bases his account mainly on British hospital ice in about 1939, since when of course no building large scale has been done. But big arrears of con- tional work must soon be undertaken if the general of hospital practice is to reach that prevailing ad, and many hospital planners are seeking guidance. dicta of the report of the departmental committee he cost of hospitals, published in 1938, and now out uch with modern developments, loom too largely hese pages. Much of Mr. Ward's material is, and ys will be, fundamental to the building of any ital, but something more about the future proba- ies of hospital form, structure, and arrangement ld have been stimulating from one who is so highly rmed.

RESISTANCE OF TUBERCLE BACILLI TO STREPTOMYCIN

HE resistance to streptomycin of a strain of *Myco. rculosis* is now believed to be the result of selection, ing the patient's treatment, of mutants which were ady present in the original bacterial population. ough the proportion of resistant mutants in a popula- n of sensitives has been estimated at less than 10 per ,000 billion they may be forefathers of a resistant e. Streptomycin no more produces drug-fastness n a carving-knife produced a breed of Manx mice. sistance appears when the innate properties of the tant favour its survival and multiplication in an vironment which becomes intolerable to its sensitive lows. If resistance to streptomycin is thus undirected d spontaneous it is important to know whether it curs, in a significant degree, among tuberculous tients who have never received the drug. Youmans d Karlson[1] found that over 90% of 131 strains of *yco. tuberculosis* from untreated patients were inhibited less than 2 μg. of streptomycin per ml. of medium, d in this issue Dr. Mitchison, examining 205 strains om 124 patients before treatment, finds a remarkably iform susceptibility to the drug. These results must e set against such reports as that of the streptomycin ommittee of the American Veterans Association in 1948 hich showed that 60% of cultures from patients who ad been treated for three months were resistant to 0 or more μg. of streptomycin per ml.

Mitchison has now examined nearly 400 resistant trains from treated patients and he finds that the strains all into three groups, each with a characteristic degree f resistance. The organisms obtained from individual atients showed an abrupt change during treatment rom sensitivity to one or other of the levels of resistance, nd when this level was reached it was maintained throughout treatment. This agrees with the view that changes in sensitivity do not occur by any Lamarckian process of training. One group of organisms was found by Mitchison to be only four times less sensitive than that of the standard strain of *Myco. tuberculosis*, and it is obviously important to know whether the concentration of streptomycin in the patient's lesion is sufficient to deal with these slightly resistant strains. Our present relatively crude sensitivity tests may not always detect such small degrees of resistance, and this may account for some of the failures in treatment when the infecting strain has been reported as sensitive.

The problem of streptomycin-resistant strains of *Myco. tuberculosis* is also being tackled from the prevention angle. It was shown in 1946 that the development in vitro of resistant strains could be retarded by adding diaminodiphenylsulfone to the medium, and Graessle and Pietrowski[2] found that *p*-aminosalicylic acid (P.A.S.) acts in the same way. Karlson and others,[3] at the Mayo Clinic, have now done periodic sensitivity tests on cultures of tubercle bacilli isolated from 14 patients being treated with combinations of streptomycin, P.A.S., and promin. At the end of three months of treatment streptomycin-resistant tubercle bacilli were found in only 1 case, although after six months' treatment 3 additional cases also had resistant strains. These are encouraging if only provisional results, and it may well be that streptomycin and P.A.S. or some other form of combined therapy will keep the resistant mutant in his numerical place.

RULING THE WAVES

ADVERTISEMENTS are so much a part of our daily lives that very few, however detached, can be unaware that permanent waving at home by a "cold process" is a matter of interest to many.

Astbury and Bell[4] have shown that keratin—of which hair is largely composed—is one of a group of fibrous proteins with a common molecular pattern and elastic properties. The structural unit of the group is a grid whose main chains are drawn into a sequence of folds; when the fibres are stretched the grid is extended, but when the tension is released it returns to its folded arrangement. Although the analogy is not complete, those who are not chemists can best understand the process by thinking of a lazy tongs in the positions of closure and complete extension. Without moisture the human hair cannot be stretched, and under tension it snaps. If, however, it is dried in a stretched condition little or no contraction takes place. This physical property is the basis of what the hairdressers term a "water-wave." Harry[5] has explained that if the temperature of the wetting agent is increased and the liquid made sufficiently alkaline, a chemical reaction takes place; the elasticity of the hair relaxes, and new and somewhat unstable links between various polypeptide chains form which tend to hold the hair in its new position. A stage may be reached when the alteration is "permanent" and cannot be completely reversed. This property is exploited in many types of "permanent waving." Sebum and dirt are first removed by shampooing; the hair is wound round rollers; a strip of material moistened with a suitable solution is wound round each curl, which is then encased in a heating device; and the hair is "steamed." Harry has found that the most satisfactory permanent-waving solutions contain ammonium hydroxide with borax or sodium (or potassium) carbonate. After the "perm" is completed, the curled hair is wetted, rearranged, and dried, a water-wave being thus superimposed on the permanent wave.

Methods of waving the hair which do not require the use of a cumbersome heating apparatus usually depend on the action of an alkaline reducing agent—commonly a thioglycolate. The hair is wound on to suitable rollers or "curlers"; the agent is applied for a time and then neutralised—and the wave fixed—by an oxidising agent, which sometimes is potassium bromate. One type of solution contains approximately 6% ammonium thioglycolate in water adjusted to a pH of about 9·6.[5]

The hazards of home permanent waving are fourfold. First, owing to inexperience the user may place her curlers in the wrong positions and be vastly disgruntled with the results. But greater disasters are possible. If the waving solution is left to act too long, or is not properly neutralised, or is used too often, the hair may become devitalised, and a day or two later, when combed, the treasured curls—like the proverbial cup-handle—come

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1. Youmans, G. P., Karlson, A. G. *Amer. rev. Tuberc.* 1947, 55, 529.
2. Graessle, O. E., Pietrowski, J. J. *J. Bact.* 1949, 57, 459.
3. Karlson, A. G., et al. *Proc. Mayo Clin.* 1949, 24, 85.
4. Astbury, W. T., Bell, F. O. *Nature, Lond.* 1941, 147, 696.
5. Harry, R. G. Principles and Practice of Modern Cosmetics. London: 1944, vol. I; 1948, vol. II.

admirable pamphlet[12] on the care and sterilisation of syringes. The recommendations seem to be faithfully followed in V.D. departments, but they are still not adopted in all general wards. There are two ways, perhaps, in which these chinks may be sealed. First, since dressings and the like will in future be increasingly bought in bulk, the Ministry of Health might insert a clause in the specifications demanding freedom from clostridial spores. Secondly, a "purity squad" should be an accepted part of the organisation of every hospital.

Annotations

WORLD MEDICAL ASSOCIATION

THIS association has been holding its third annual assembly in London this week, at B.M.A. House. On British initiative it was founded, after the war, to promote closer ties among national medical associations and the doctors of the world, and membership is open to such associations. Forty-two countries now belong—the national associations of two of them being admitted last Tuesday—and twenty-nine of the members have sent delegates to the present assembly. There are no delegates from Bulgaria, Hungary, and Poland, and the president of the Chinese Medical Association, Dr. John Yui, has been unable to attend. At the opening of the assembly, the retiring president, Prof. Eugène Marquis (France), spoke of the strength of the organisation, and referred to the Code of Geneva—a modern version of the Hippocratic Oath drawn up and adopted at the last assembly—as "this code which we hope will bring to the same standard the medical ethics for all nations who favour the cult of liberty." This year's president is Dr. Charles Hill, secretary of the British Medical Association.

The inaugural meeting agreed that a further study should be made of the status of the medical profession, particularly in relation to medical man-power, membership of national associations, and the economic status of the medical practitioner, including his standard of living and how this compares with that of other professional persons. The assembly was also in favour of studies on pharmaceutical practices and on hospitals; investigations already undertaken include those on social security and allied subjects, and on postgraduate medical education and specialist training. A conference is to be called for the coordination of scientific medical organisations, provided enough are interested: Dr. T. C. Routley (Canada), as chairman of council, explained that the idea was that through the W.M.A. such organisations could express their views to governments. Dr. Routley also referred to the value of exchanging medical journals, not only for providing information but also as an inspiration for future activities. The council has agreed that countries in the sterling area shall, for a time at least, continue to pay as subscriptions the amounts of their own money which they would have paid before devaluation—a provision which the Australian delegate, Dr. L. Llewellin Davey, described as very generous. The assembly passed a hearty vote of thanks to the American Medical Association and the United States committee of the World Medical Association. This committee raises funds in the United States which have enabled the W.M.A. to meet its initial running costs, and it is an indication of the interest taken in the association by individual U.S. doctors that they subscribed 12,000 dollars during the first six months of this year, the rest coming from other sources.

Observers from a number of outside bodies have attending the assembly. These include [illegible] from the World Health Organisation of the Nations, to which, it is stated, the World Association bears the same relation as does the B to the Ministry of Health—or nearly the same.

HOSPITAL FITTINGS AND DESIGN

IN these days of mental and material mass [illegible] Mr. Ronald Ward[1] holds no brief for standardis[illegible] hospitals or of their major components; as an ar[illegible] his view is that "ideally every hospital building [illegible] be a skin or shell that will change or grow as the organism within it changes and grows." These large complex structures are still so experimental that are not ripe for attempts at standardisation: a hospital of any size is still an object of internatio[illegible] interest and curiosity. One such standard, which Ward endorses, is that wards must have maximal [illegible] exposure, and that their windows must be as large [illegible] possible; but this fixes the aspect of the hospital within a small compass range, and defines the format of a large part of its buildings. In other countries in similar latitudes it has been found that the patients' average st[illegible] in an acute hospital is about three weeks, that really [illegible] people actively dislike strong [illegible] that the aspect of the wards in this respect m[illegible] than is usually thought. If the southerly fixation-complex could be sublimated to some extent, perhaps the flexibility and compactness of hospital design could be materially improved. The principle of "reason in all things" should also be applied to the ward windows, and the specific planning of at least two single rooms with [illegible] north aspect in each nursing unit is not amiss.

The departments of most importance to the patient—and he sometimes gets forgotten in hospital planning—are those for outpatients and inpatients. Mr. Ward advocates the very proper policy that the outpatient department should be mainly consultative; he might have added that its chief economic function is to keep patients at their work and out of the hospital beds. Something about the provision of comfort for the waiting patient and his relatives would have been welcome in his book, with a few words about perambulator parks, the care of children while their parents are being examined, and architectural treatment to alleviate the station-like dreariness of many outpatient halls and waiting-rooms in British hospitals. It seems likely that the ward unit formed of a number of small sick-rooms has come to stay for some time, and Mr. Ward might well have discussed the structural and administrative implications of this change more fully. These small rooms permit the housing of both sexes within the same unit, thus simplifying many admission problems. The growing practice of getting patients out of bed as soon as possible is driving home the need for more than 2 water-closets to each 25–30-bed unit; moreover as the number of beds in a sick-room—and therefore the size and cubic content—decrease, it becomes more desirable to avoid the use of the bedpan in it. The long-established custom of placing water-closets on the outside wall is also due for reconsideration; if they are transferred to the inside wall and given adequate mechanical ventilation, the ward- can be planned more compactly, with corresponding advantage to the nursing staff, and the greater freedom of design is possible. Double swing-doors should have no place in ward units and have disappeared in most modern hospitals outside this country. In the ward kitchen small mechanical dishwashers should be a usual fitting, like refrigerators. The problem of removing garbage from ward units except by man-power seems to

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[12] Medical Research Council War Memo no. 15, London, 1945.

[1] The Design and Equipment of Hospitals. London: Baillière, Tindall, and Cox. 1949. Pp. 360. 42s.

Special Articles

THE LONG-STAY PATIENT

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e term "chronic sick" is so vague and so difficult ine that some other would be better: and I would st that the whole range of this class of patient be d "long-stay" and not chronic. It is obvious those making up the total include many medical ories, some of which are set out below.

TUBERCULOSIS AND CANCER

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THE OTHER PATIENTS

With these two medical categories disposed of, what er groups of long-stay sick remain? Who shall care them, and where?

I suggest that the term long-stay patient should be plied to those who are not likely to be less than six onths in hospital. All patients who can possibly be red within six months, and also those who, within at time, can be sufficiently relieved for them to return normal and usual employment should go to acute its.

Senile Cases.—The physical age of human beings nnot be defined entirely by the age in years. Many the 70–80 age-group are physically and mentally etter than some in the 65–70 age-group; and the easons must be sought by careful study of both indi- iduals and groups. By proper organisation of patients n this geriatric group the stage of physical and mental eakness with double incontinence may be avoided or delayed. Those who reach this penultimate stage can only receive nursing care, and should therefore be housed in long-stay annexes where this can be provided.

Elderly Long-stay Sick.—Various conditions can affect the elderly; this group will include people *over 55 years of age* suffering from all types of ailments, and whose recovery-rate is retarded. Apart from malignancy, which has already been mentioned, chest troubles probably claim the greatest number of victims, with cardiovascular diseases second.

The elderly are prone to the same diseases as the young, but their resistance is often diminished and their condition likely to be aggravated by repeated attacks of their "seasonal" trouble. Thus, at some stage, their illness is likely to become more protracted, and the time when they become classified as chronic sick is a matter of chance. Some acquire the label when they should really be eligible for treatment as acute cases, simply because it is known that their convalescence is likely to take longer than that of a young person. This particularly applies to the pulmonary cases; many sufferers over 55 years of age today are rather unfairly classified as cases of chronic bronchitis and diverted to the chronic wards. The long-stay classification based on six months in hospital would bring many of these patients into the acute wards, where full examination should at any rate distinguish those with carcinoma of lung, or tuberculosis. Patients with cardiac conditions, particularly those with signs of cardiac failure, would more probably gravitate into the long-stay group.

The group of patients with senile dementia associated with cardiovascular changes would go either to a mental or to a long-stay unit, depending on their symptoms. Many elderly patients develop mental symptoms, and they present a serious problem. Their mental and physical hyperactivity makes them difficult to manage at home, and since it became so difficult to find them hospital beds, there has been a growing tendency to gain their admission by using an order under the Lunacy Acts. This seems unjust, for it often happens that the period of hyperexcitability precedes a calm, which heralds a fatal termination. It is true that hospital beds are often sought for elderly people who have developed ailments which could quite well be treated in the home: the usual plea is that there is no-one to look after the old man or woman at home. Many who manage to live quite well by themselves in a room are dependent on others when they fall sick: but they cannot indefinitely depend on the good will of a neighbour to feed and look after them, however small the amount of attention. In such circumstances the old person's condition tends to deteriorate and the requests are renewed to the hospital for admission. It is true that the service of home helps is designed to assist such persons, but often the home helps are only available on paper and not in a material form, and until there is a great change in our social and housing position this group of patients should—if only for reasons of humanity—be referred to the long-stay unit. The unit, with their team, should give domiciliary care working closely with the patient's own doctor. Only in this way can cases be selected fairly for admission to hospital; and in this way we could ensure that these people do not continue indefinitely unattended and without help.

Young Long-stay Sick.—The term "chronic sick" is often associated with the idea of old age; but the long-stay sick group unfortunately includes many young people. Among them are patients with nervous lesions such as disseminated sclerosis, rheumatic lesions (chiefly rheumatoid arthritis), certain cardiac and pulmonary lesions, and incurable cancer.

Transferred Cases from Acute Units.—A further group includes cases which other units have transferred as hopeless, and for which no treatment has any immediate prospect of success. Some come within the categories already defined, and have been passed on from acute wards or from special departments. Among them are skin cases and orthopædic cases. These patients should be carefully vetted before being readily accepted as long-stay cases. It may be necessary that a patient who is blocking an acute bed should be transferred as soon as possible, but the choice of patient to be moved should rest with more senior members of the acute away in the hand. The third hazard is of irritation by, or sensitisation to, the chemicals employed; probably this is not of much significance, for it is said that after thirty million cold waves had been given in the U.S.A. the number of allegations of dermatitis or damage to the hair or scalp was still very small. The fourth hazard—which appears to be only of theoretical importance—concerns toxic effects on the liver, kidneys, and hæmopoietic system.

Reports on the medical aspects of cold waving are meagre and conflicting. Goldman and his colleagues,[6] while they seem to believe that irritation and sensitisation may arise from the use of thioglycolate solutions, emphasise that if dermatitis comes on after a cold wave the following chemicals must be considered: the preliminary shampoo, the preliminary cleansing lotion (if used), the cold-wave material, the oxidising agent, and the post-treatment shampoo and wave-setting material (if these are employed). A more recent report by Behrman and others [7] states that of 390 members of a group who had varying contacts with cold-waving solutions, only 0·26% reacted to patch tests. Of 226 factory employees carefully investigated for evidence of toxic effects caused by the solutions concerned (72 being daily in close contact with the chemicals), none showed evidence of acute or chronic disease of the liver, kidneys, or hæmopoietic system which could be attributed to their work. Those who wish to pursue the matter further may refer to a recent review by MacKenna.[8]

The lesson that emerges from these studies is that when a patient alleges that dermatitis has been caused by cold-waving solutions, her explanation should not be accepted until other chemicals which have been applied to the hair and scalp are proved guiltless.

FOR PARENTS OF MENTAL DEFECTIVES

The discovery that a child is mentally defective often comes as a bitter blow to parents, and one which they find it hard to accept. All who have worked with mental defectives know those tragic parents who take the baby from doctor to doctor and scan the face of each for a reprieve. The only way to help these parents is to teach them to accept the child's defect and enjoy his other qualities. Nearly all mentally defective children are lovable, and once the criterion of intelligence is set aside they are often found to be the peers, or indeed the superiors, of their contemporaries in other qualities. They may be affectionate, obedient, easily pleased, and friendly to strangers, and they are usually lighthearted. The National Association of Mental Health have published a pamphlet [9] encouraging parents to accept the disability and help the child to make the most of the intelligence he has. They are warned that the task of teaching will be a slow one, and that much patience will be needed to get him to learn the movements which other children pick up unnoticed. A list is given of equipment useful in his training—such things as bean bags and bales to teach him to throw and catch; water and sand; a doll to dress and undress; push-and-pull toys; painted cotton reels to thread; and strips of cloth nailed to a board, carrying buttons and button-holes to do up, or laces to practise lacing his shoes and tying bows. An account in the appendix by an American mother of how she came to understand the position and to help and enjoy her child makes instructive as well as moving reading.

ANKYLOSING SPONDYLITIS

Though ankylosing spondylitis is commoner used to think, careful studies of large series are still rare enough to earn our gratitude. accounts have lately been published—one, on 1 by Mowbray and his colleagues [1] at Newcastle, other, on 73 cases, by Hart and others,[2] f Westminster Hospital. The two groups agree fundamental point—the absolute distinction ankylosing spondylitis and rheumatoid arthritis; is quoted of a miner who suffered simultane both conditions, which progressed independ at different rates. Both articles dwell on the bi distinctions between the two diseases. Serum-fl tests, whether of the thymol-turbidity or the coll variety, are rarely positive in spondylitis though so in rheumatoid cases; and the only point of r between the two disorders is the tendency to re the serum albumin-globulin ratio—which may that in both some infective factor is at work. been suggested that the preponderance of males sufferers from spondylitis implies an endocrine but careful estimation of urinary 17-ketosteroid gave essentially normal findings.

The Newcastle workers postulate an initial d osteoclastic stage, followed by a sclerotic ost reaction, while the Westminster group suggest least some of the apparent destructive sacro-iliac is really due to superimposition on the joint the X-ray film of patchy iliac sclerosis which is para-articular. Hart and his colleagues found that earliest symptom was lumbosacral backache, and three-quarters of the cases had sciatica at some or other, which arouses the suspicion that a diagnosis of disc prolapse is still being made in men who really have spondylitis. As regards trea strict rest or immobilisation of any kind is said cause deterioration and stiffness, and there is objection to physiotherapy except in the form of X-ray therapy is the treatment of choice, given not the original wide-field applications advocated by but to the spine alone and only to the known areas. But surely Hart and his associates are on firm ground in decrying the value of surgical assist especially since they also emphasise the fatal infl of hip involvement on the prognosis. The fact is bilateral hip-fusion demands an arthroplasty of kind, which makes all the difference to comfort capacity.

Finally, the Westminster Hospital report insists, ankylosing spondylitis can be diagnosed with ease than most conditions in medicine, and that chronic joint diseases affect earning capacity so This may be a rather optimistic estimate; but cert fewer bowed cripples would be seen in our streets their condition had been diagnosed before the sp changes became irreversible. In the Westminster Hos cases, the average interval between onset of sym and diagnosis was almost three years.

On Oct. 10 the King visited Sir Maurice C at his London home to invest him with the G.C.V The honour was conferred last May after the K illness, but injuries received in a car accident prevented Sir Maurice from going to Buckingham Palace

Dr. Geoffrey Marshall will deliver the Harveian oration to the Royal College of Physicians of London, Pall Mall East, S.W.1, on St. Luke's Day, Tuesday, Oct. 18, at 3 P.M. He is to speak on Individuality in Medicine.

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6. Goldman, L., Mason, L., McDaniel, W. *J. Amer. med. Ass.* 1948, 137, 355.
7. Behrman, H. T., Combes, F. C., Weissberg, G., Mulinos, M. G., Hurwitz, M. M. *Ibid*, 1949, 140, 1208.
8. MacKenna, R. M. B. in the *Medical Annual*. London, 1949; p. 139.
9. Children who can Never go to School. To be had from the National Association of Mental Health, 39, Queen Anne Street, London, W.1. Pp. 15. 9*d*.

1. Mowbray, R., Latner, A. L., Middlemiss, J. H. *Quart. J. Med.* 1949, 18, 187.
2. Hart, F. D., Robinson, K. C., Allchin, F. M., Maclagan, N. F. *Ibid*, p. 217.
3. Scott, G. Wide Field X-ray Treatment. London, 1939.

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THE OTHER PATIENTS

With these two medical categories disposed of, what er groups of long-stay sick remain? Who shall care them, and where?

I suggest that the term long-stay patient should be plied to those who are not likely to be less than six onths in hospital. All patients who can possibly be red within six months, and also those who, within at time, can be sufficiently relieved for them to return normal and usual employment should go to acute its.

Senile Cases.—The physical age of human beings annot be defined entirely by the age in years. Many the 70–80 age-group are physically and mentally etter than some in the 65–70 age-group; and the easons must be sought by careful study of both indi-viduals and groups. By proper organisation of patients n this geriatric group the stage of physical and mental weakness with double incontinence may be avoided or delayed. Those who reach this penultimate stage can only receive nursing care, and should therefore be housed in long-stay annexes where this can be provided.

Elderly Long-stay Sick.—Various conditions can affect the elderly; this group will include people *over 55 years of age* suffering from all types of ailments, and whose recovery-rate is retarded. Apart from malignancy, which has already been mentioned, chest troubles probably claim the greatest number of victims, with cardiovascular diseases second.

The elderly are prone to the same diseases as the young, but their resistance is often diminished and their condition likely to be aggravated by repeated attacks of their "seasonal" trouble. Thus, at some stage, their illness is likely to become more protracted, and the time when they become classified as chronic sick is a matter of chance. Some acquire the label when they should really be eligible for treatment as acute cases, simply because it is known that their convalescence is likely to take longer than that of a young person. This particularly applies to the pulmonary cases; many sufferers over 55 years of age today are rather unfairly classified as cases of chronic bronchitis and diverted to the chronic wards. The long-stay classification based on six months in hospital would bring many of these patients into the acute wards, where full examination should at any rate distinguish those with carcinoma of lung, or tuberculosis. Patients with cardiac conditions, particularly those with signs of cardiac failure, would more probably gravitate into the long-stay group.

The group of patients with senile dementia associated with cardiovascular changes would go either to a mental or to a long-stay unit, depending on their symptoms. Many elderly patients develop mental symptoms, and they present a serious problem. Their mental and physical hyperactivity makes them difficult to manage at home, and since it became so difficult to find them hospital beds, there has been a growing tendency to gain their admission by using an order under the Lunacy Acts. This seems unjust, for it often happens that the period of hyperexcitability precedes a calm, which heralds a fatal termination. It is true that hospital beds are often sought for elderly people who have developed ailments which could quite well be treated in the home: the usual plea is that there is no-one to look after the old man or woman at home. Many who manage to live quite well by themselves in a room are dependent on others when they fall sick; but they cannot indefinitely depend on the good will of a neighbour to feed and look after them, however small the amount of attention. In such circumstances the old person's condition tends to deteriorate and the requests are renewed to the hospital for admission. It is true that the service of home helps is designed to assist such persons, but often the home helps are only available on paper and not in a material form, and until there is a great change in our social and housing position this group of patients should—if only for reasons of humanity—be referred to the long-stay unit. The unit, with their team, should give domiciliary care working closely with the patient's own doctor. Only in this way can cases be selected fairly for admission to hospital: and in this way we could ensure that these people do not continue indefinitely unattended and without help.

Young Long-stay Sick.—The term "chronic sick" is often associated with the idea of old age; but the long-stay sick group unfortunately includes many young people. Among them are patients with nervous lesions such as disseminated sclerosis, rheumatic lesions (chiefly rheumatoid arthritis), certain cardiac and pulmonary lesions, and incurable cancer.

Transferred Cases from Acute Units.—A further group includes cases which other units have transferred as hopeless, and for which no treatment has any immediate prospect of success. Some come within the categories already defined, and have been passed on from acute wards or from special departments. Among them are skin cases and orthopædic cases. These patients should be carefully vetted before being readily accepted as long-stay cases. It may be necessary that a patient who is blocking an acute bed should be transferred as soon as possible, but the choice of patient to be moved should rest with more senior members of the acute hospital medical staff than has been customary in the past.

STAFFING

The long-stay unit staff must be a carefully selected team of medical, nursing, and ancillary personnel. The patience and continuous effort needed in the care of this class of patient cannot be expected from every member of the nursing and ancillary professions. The ancillary team must include physiotherapists, social and domiciliary workers, and dietitians. The long-stay unit must be recognised as an important *nursing* unit. It should maintain a strong link with acute and special units, and all nurses in training should have a period in the main ward and annexes of the long-stay unit. The main long-stay unit would thus become an important part of the complete training-school, whether a single hospital or in a group.

An exception might be made for wards occupied by the physically and mentally weak, most of whom are doubly incontinent. Prospects of improvement in our hospitals are at present somewhat remote, and the best should therefore be made of accommodation now available. The chief requirement of these patients is good nursing care, and it might be well to leave their wards outside the training-school and place them under independent trained staff supplemented by assistant nurses, nursing orderlies, and ward orderlies. The care of such patients is regarded as unattractive by nurses in training; and those choosing permanent employment in this work are likely to be looked down on. Many of the men and women who undertake it lack the education nowadays required in order to pass nursing examinations; but it has been my experience that they are often first-class practical nurses—not the mere domestics of the nursing profession, but people who take a pride in their work and deserve more praise and higher status than they have at present. They need encouragement in the unpleasant job of work they are doing, and I think it would be easier to enhance and encourage their work if they were set apart from the influence of the matron and senior nursing staff of a training-school. Let this section be put under a trained nursing head, who, supported by certificated nurses and non-trained staff, would have a personal and full-time interest in managing it.

ACCOMMODATION

The long-stay unit team have not the happy prospect of seeing their patients make a quick recovery; and patients transferred from the acute wards to the long-stay unit realise that their hopes of a quick recovery are less than when they first entered hospital. Their depression should be minimised; and I advise that the main long-stay unit, which would act as the filter for a long-stay annexe, should be the brightest and most convenient that can be obtained. Ground-floor wards have much in their favour, since patients can be wheeled out into the fresh air and sunshine; and gardens made colourful with flowers do much to uplift the morale of sick people. The staff selected for work with long-stay patients find the work more attractive if they do it in good bright cheerful surroundings.

To allow long-stay patients to be "dumped" in dull dreary old institutional wards frustrates the efforts of those working for them. Such a tragic and pitiful error, if it were perpetuated, might well bring recriminations on the health service as a whole.

THE FIRST YEAR

REVIEW BY THE MINISTER

OVER two hundred press representatives last heard Mr. Aneurin Bevan, the Minister of the first year of the National Health Service in and Wales.

Mr. Bevan claimed that the transition from system to the new had been accomplished very Most of the shortcomings of the scheme were to intrinsic defects, but to the overwhelming need that had been disclosed. The cost of the was about £300 million a year—twice the sum estimated, the increase being attributable increases in remuneration. There was no knowing what citizens used to spend on medical One estimate was £250 million per annum, though himself believed that the total was still larger.

The cost of the new service would be greater but the voluntary work of the 12,000 people administered it through the various statutory bo Thanks to them, administrative expenses were 2·5–3% of the total. Little further saving could expected here; administration was already "stre lined."

Abuse of the service there certainly had been; the prominence given to reports of abuse had given false impression of its prevalence. One reason why patient might abuse the service was the desire to " my money's worth" for the weekly contributions; this desire sprang from misapprehension of the purpo served by the National Insurance contributions. (point of fact, the health service benefited from the contributions only to the extent of some £40 millio per annum.) By those operating the service, abuse ha been rare; hitherto the central tribunal had heard fi appeals against disciplinary action.

Mr. Bevan pleaded for economy in prescribing. Th average cost per prescription was 2*s.* 9*d.* Over-prescribin was commonest in respect, not of expensive drugs, bu of everyday medicaments such as aspirin and cotton wool; and he asked that the general practitioner should be prudent and that the patient should not be importunate. A committee, headed by Sir Henry Cohen, wa drawing up a list of drugs that could be provided by general practitioners. "Sometimes general practitioners prescribe certain drugs which are far more expensive than other drugs which are quite as suitable."

In answer to a question, the Minister admitted that he had no figures to show how much time the practitioner now spent on paper-work. "I have also not got any analysis of the time it took a general practitioner to fill up his bills before."

On health centres he declared his intention "to go steadily but cautiously." These centres must take their place in the queue; in the capital-investment programme other items came first.

The rush for spectacles was far greater than had been anticipated. Over 5 million pairs had been supplied, and a further 3 million were on order. Now, however, spectacles were being produced at the rate of 7 million pairs a year; and production would be equal to the current demand by the end of this year. As to hearing-aids, 29,000 had been issued, and it was hoped that the total would be up to 150,000 by the end of next year. The delay was not in manufacture but in dispensing.

Questioned about possible economies, Mr. Bevan said that these might be possible on the supplies side, through standardisation and central ordering. For example, the Government hearing-aid, which was better than some for which people paid £40–50, was being produced for a little over £4.

Asked about the cost to the nation of visitors from overseas who receive free medical attention in this

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"... In order to become good or adequate members of a community it is necessary for us to observe certain standards of decency and coöperation, and to observe them *all the time.* ... But what we wanted to do as infants (and what it is in our nature to want to do today) is to be very generous and friendly and coöperative at one moment, and very selfish and aggressive at another—very decent one minute and very indecent the next."—Dr. RANYARD WEST, *Psychology and World Order*, London, 1945.

y, Mr. Bevan said: "This story about lascars g over, getting artificial teeth, and selling them l is an example of journalistic imagination." e was allowed to enter the country simply to t by the service. On the basis of a month's stay, the service in the same way as did British citizens, al attention to 633,000 foreign visitors (last year's would cost the country about £200,000 a year. He opeful that reciprocal arrangements between this ther countries might be completed; the parties to russels Pact were being approached.

Bevan was closely questioned about a possible tax for medical service. "If by that," he said, neant a payment by the patient at the moment the patient needs treatment, then we have set our against it." Asked about payment for medicines, eclared: "It would require an alteration of the te to do it and the difficulty here is that if the nt to be paid by a patient is to be a deterrent, it be more than nominal. If it is more than nominal y be a hardship in some cases." To a suggestion a payment of 10s. should be made for spectacles, he ted that this would tell hard on the old-age pen- r. Asked whether the weekly contribution might creased, he replied: "The possibilities of taxation nfinite."

e Minister's review included the following further es:

ticles prescribed by general practitioners, % :	
Mixtures	40
Tablets, pills, &c.	20
Ointments	5
Proprietary preparations	12
Appliances	7
Miscellaneous	16
octors receiving basic salary	2000
octors receiving special-inducement payment	57*
raining of assistants under grant :	
Doctors approved for grant for training	374*
Assistants in training	197*
Doctors utilising postgraduate courses under grant	250*

* Further claims under review.

NCTIONS AND STAFFING OF HOSPITALS

The following important statement has been received by gional hospital boards from the Ministry of Health.

Under the National Health Service (Functions of gional Hospital Boards, &c.) Regulations (S.I., 1948, o. 60) the Minister's powers for planning and developing e hospital and specialist services were, subject to rection, delegated to regional hospital boards and oards of governors. It is therefore competent to the oard, subject to direction, to make changes in the use f hospitals without prior reference to the Minister. The inister is aware that boards have been considering hanges of user in the hospitals under their administration, and it is right and proper that they should do so.

The Minister is anxious to avoid intervening where oards have arrived at a decision after full consideration, ut the delegation of powers is subject to direction on is part, and under section 6 (4) of the Act he is bound n using hospitals transferred to him by the Act "so far as practicable" to "secure that the objects for which [they were] used immediately before the appointed day are not prejudiced by the provisions of this section" (i.e., transfer to the Minister). He cannot, therefore, ignore representations made to him by members of the public and the profession, and may feel bound at any time to call upon a board to report to him their reasons for adopting their new policy. It is undesirable for this to happen after the actual process of change has been begun, and he thinks boards will find it useful, where a proposal is likely to give rise to substantial local or professional opposition, to keep the Department informed of their plans at all stages.

Boards may find useful the following indication of the Minister's views on a number of matters that arise in connexion with changes of use of hospitals. The principal factors are, of course (1) the possible loss of service to patients, and (2) the disturbance of medical staff.

Change from one specialty to another or from a general to a special hospital.—In the case of infectious-disease and smallpox hospitals, which tend to be redundant owing to centralisation, little difficulty is expected provided that regional boards have assured themselves that the new centralised facilities meet anticipated needs and have done their best to secure that the staffs of the redundant hospitals are not prejudiced by the change. In the case of other changes of this nature—i.e., from one special use to another or from general to special hospital—the difficulties encountered may be more serious; in particular, where a hospital of long-standing repute is concerned, the board should see that the medical staff of the hospital has free opportunity of having its views considered by the board or their planning committee orally if possible. An open meeting at which the proposal can be explained and members of the public can express their views may sometimes be desirable, particularly where it is proposed to use a small local general hospital for other purposes, since the local loyalty that such hospitals command must not be ignored even where reorganisation is expected to produce greater medical efficiency.

Change from general-practitioner (cottage) hospital to specialist hospital.—Local loyalty is again a factor of great importance. In the past general-practitioner hospitals have, owing to the uneven distribution of consultants, been compelled at times to undertake work for which they were not properly equipped, and they have often been criticised for trying to do too much. The introduction of the National Health Service, and in particular the present review of establishments, has given an opportunity for improving this state of affairs and for developing hospitals staffed by consultants even in smaller centres. The Minister is wholeheartedly in favour of development in this direction but would ask regional hospital boards to make sure that in carrying out their plans they are not depriving local patients of a valuable feature of the general-practitioner (cottage) hospital—i.e., its use as a local hospital to which the general practitioners of the neighbourhood can admit patients who require treatment within the scope of a general practitioner but who, for various good reasons, cannot be treated at home. It is, in the Minister's view, very valuable for the general-practitioner service of the district when the family doctor has access to beds where patients of this type can be in his charge and he knows he can readily call upon the services of a consultant for a second opinion, and it is essential if the level of general-practitioner medicine is to be maintained that the interchange of ideas between general practitioners and specialists should be facilitated by such consultation and by informal contacts on the occasion of regular visits from consultants to general-practitioner hospitals. If such arrangements can be supplemented by the offer of a number of "clinical assistantships" to general practitioners as part of a team in the district general hospital so much the better, but in the Minister's view the latter is not a substitute for the former, and if the result of reorganisation is to deprive general practitioners of charge of hospital beds something valuable has been lost. In particular the Minister wishes regional boards to guard against the feeling that local cottage hospitals are merely buildings to be used as additional accommodation for relieving pressure on beds at the district general hospital of the group. There may be cases where it will improve the efficiency of the group organisation for a general-practitioner hospital within that group to be used as a specialist department—e.g., as a maternity unit, recovery hospital, or geriatric unit. But if the loss to the district of the "general-practitioner beds" is to be avoided the board should make arrangements for the general practitioners of the district to have charge of a number of beds in the district hospital or elsewhere which can then serve, in the way described above, as a "general-practitioner wing."

General-practitioner maternity hospitals.—It has been the general practice to have obstetricians in charge of maternity departments and maternity hospitals. While recognising the merits of this policy in the large unit where teaching and training is undertaken, the Minister feels that he should remind boards that in the smaller types of maternity unit booking normal cases, staffing must necessarily vary. Where, in the larger of these, selected general-practitioner obstetricians have been in charge in the past, boards should carefully consider the position before altering the nature of the services provided and should be cautious about depriving general-practitioner obstetricians of the charge of maternity beds. In the smaller cottage-hospital type of provision where general practitioners attend their own patients a selected general-practitioner obstetrician should have the general oversight of the unit. Boards should endeavour to link the smaller units with the nearest maternity department and make readily available to the general-practitioner obstetricians concerned the consultant obstetric services of the larger hospital.

NARCOTIC POISONING

It is announced in the *Journal* of the Danish Medical Association[1] that from now onwards, all the cases of narcotic poisoning in Copenhagen requiring hospital treatment are to be drafted into the same hospital. Certain of Copenhagen's hospitals having been invited to undertake this task and having declined it, the psychiatric department of the Bispebjerg Hospital gave its consent to a scheme in which the doctors of Copenhagen and its ambulance services are henceforth to participate. The rule is that any unconscious patients, for whose condition no other reason than narcotic poisoning is forthcoming, are to be conveyed to the Bispebjerg Hospital whatever the regulations hitherto in vogue. As long as they are unconscious, these patients are kept in the psychiatric department. On the return of consciousness they are drafted to another section of this department if psychiatric after-treatment is desirable. Otherwise they may be transferred to a "somatic" section of the hospital. This innovation is regarded as the logical outcome of the revolution which has taken place in the treatment of narcotic poisoning: as matters now stand, many hospitals cannot provide the technically skilled staff nor the costly apparatus required for the up-to-date treatment of these patients whose fate so often hangs most delicately in the balance.

One of the Danish pioneers in this field is Dr. Aage Kirkegaard, who has described[2] the advances made of late years. As he points out the unconscious patient suffering from barbiturate poisoning needs the closest supervision, with a record of the respiration, pulse, temperature, blood-pressure, and percentage of hæmoglobin every four hours, not to mention daily plasma analyses. To avoid aspiration into the lungs, all irrigation of the stomach should be carried out in the Trendelenburg position, and the threat of acute œdema of the lungs must at once be met by the administration of glucose or sucrose, supplemented if need be by strophanthin, or oxygen, with or without carbon dioxide, to combat the danger of collapse. Analeptics of the leptazol group, the sulphonamides (for the prevention of pneumonia), blood-transfusion (for the prevention of secondary shock), and gastric irrigation with charcoal and magnesium sulphate are only some of the many modern weapons against narcotic poisoning.

In England Now

A Running Commentary by Peripatetic Co[illegible]

OUR firstborn is a holy terror. From 6.30 P.M. to [illegible] he is quiet, recuperating his forces. For the rest [illegible] day he rarely requires less than one adult's [illegible] attention to keep himself, the garden, and the [illegible] destruction. He crawls on his bottom by a [illegible] his own; his speed is great and his reach [illegible] He collects and eats with equal gusto handfuls of green tomatoes, weeds from the compost-heap, and windfall apples. Indoors he tears off wallpaper, [illegible] the cat's milk, blacks himself at the stove, falls [illegible] stairs, or "reads" several shelves of books at once, with the same disarming enjoyment and relen[illegible] industry.

It leads me to remember with envy two children I [illegible] a year or so ago on staff round. Two quiet, bidd[illegible] children who sat with smiling inattention side by [illegible] while their physician (he has since, poor man, gon[illegible] be professor at St. Ethelred's) discoursed about the [illegible] doctors who had forgotten to raise the dose of thy[illegible] as they grew. They were, of course, mild cretins. [illegible] only *our* incubus was a mild cretin! And why [illegible] A little daily dose of thiouracil, and we too would [illegible] a quiet, biddable child. Or so it seems. We have [illegible] yet tried it, but if we are to have a garden at all [illegible] year we may be driven to it.

Thiouracil as a poison seems to have been surprisi[illegible] neglected. How much more subtle a means than ars[illegible] to silence a too suspicious or too talkative w[illegible] "Administering a drug with unlawful intent" perhaps, something of the sort, but they could hardly call [illegible] murder.

Dorothy Sayers (I think it was) had the opposite [illegible] once—of a villain who kept the cretin heroine in sub[illegible]tion by stopping her thyroxine. It is a pity that like so[illegible] others of Miss Sayers's medica[illegible] (remem[illegible] the fatal air embolism produced [illegible] it has its flaws. No cretin, least of all one [illegible] irregularly as this lady was, has apparently m[illegible] prospect of growing up to look like a really truly hero[illegible] A thought this to stay our hand [illegible] our own infant. If we make him a [illegible] no-one will ever marry him, and then we shall never [illegible] our revenge watching him try to deal with his own brat in his turn.

* * *

It is paradoxical that in the heart of London [illegible] should be difficult to sleep at night for the noise of the birds; but that is just what has happened now the hordes of alien starlings have descended on us once more for the winter. A little before sunset they darken the sky over Westminster Bridge as they dash madly round in ever-changing cohorts and swoop on to the County Hall, where they occupy every ridge and rail of the roof and chimney-stacks. Later they take up their quarters for the night in the plane-trees outside St. Thomas's Hospital. It would not be so bad if only they slept throughout the night, but every half-hour or so, disturbed by a tram, a late reveller, or the milkman collecting (and rattling) empty milk-bottles, the starlings panic, chattering and whistling (who on earth called it a murmuration?) loudly enough to waken the sleepers, or rather to keep all would-be sleepers from sleep. And what a filthy mess they make on the pavements!

* * *

I do wish that barbed wire were not so plentiful; indeed I think I should go so far as to forbid its use. The lovely fields where once I used to walk are bristling with it, and I particularly regret that a little wood where one could gather primroses in the spring is now fenced with six rows of barbed wire. No livestock is kept in the wood and the barbed wire seems to be a gesture of defiance to those who love primroses. It seems to be a matter for the Council for the Preservation of Rural England.

Apart from this minor irritation, the Sedgemoor lanes are lovelier than ever. John and I tried to find the battlefield; but we were unsuccessful, even with the directions given by the Vicar of Weston Zoyland, who

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[1] *Ugeskr. Laeg.* Sept. 29, p. 1685.

[2] *Ibid,* March 24, p. 356.

us round his church. The Vicar said that the war
al was behind a hedge and was difficult to find.
right. But for some reason or other this difficulty
ss to a famous battlefield pleases me. I am so
at it has not been commercialised with postcard
and souvenirs: I was most annoyed to be offered
of scent when I went to look at Napoleon's tomb
s.

ne of the Sedgemoor drains we found a calf stuck
deep black mud. Her mother bellowed at us and
is to do something about it. Much more important
inding the battlefield. and the calf looked very
l when we did do something.

* * *

ure has equipped me very badly for the wrong end
stethoscope; but I am surprisingly content and
irning a lot about nursing.

nurse, it seems, *likes* being on private wards: but
hey've told me how very much they hate it, they
of begin to wonder whether they couldn't get used
in the end. No-one has ever invited them to be
ul about it, and they have bottled up a fair amount
gression against us P.P's with our bells—not that I
ring myself to use mine. least of all for getting
ne to pick up my knitting for me. which is the
f thing they expect (supposing I happened to have
nitting).

e nurses' favourite—as I discovered long ago—is
ublic-ward male patient. well mechanised. docile,
admiring. Nearly every nurse on this ward is a
porary" (I suppose the only basis on which they
ome at all), and if they look at all truculent, it's
ell to remember that they may have been snatched
ght from a male ward and are therefore suffering
ies of disappointment and repressed hostility against
ority. I diagnosed this unhappy state correctly in
's staff nurse, who has been a different woman
telling me that she is "as miserable as sin" here.
ct, I seem to have got to the right end of the stetho-
somehow, and am just wondering how I am going
e it if these heart-to-heart chats go on interrupting
etter-writing all the time. Still, I must somehow
good the vast difference between myself and a
anised male.

* * *

have not recognised that "punning" in dreams
h Freud describes, but I experienced pure farce
night. I was doing a cholecystectomy on my friend
suddenly I became aware that I had only an
n over my other clothes, and my fingers were coming
gh my gloves. I demanded a sterile gown; then
sed I had on not only the gown but a raincoat
op. I cried out in great indignation at the nurse:
u stupid fool. you take advantage of the fact that
n preoccupied with something else to put a raincoat
ne," at which she burst out weeping, and all the
of the theatre staff as well.

wonder what Freud would have made of that.
ems to me like something Lewis Carroll might have
ten. It was, I should say, a jumbling together into
kind of coherency of the previous day's experiences.
d been reading up, before supper, how to do a
ecystectomy: I had also put on a raincoat, as we
no fire in the dining-room; doing a vaginal examina-
that morning the gloves the head orderly had put
for me were torn; and he had been in to see me in the
moon about his son at hospital. I was conscious
wo affective elements in the dream—one, perhaps a
-fulfilment—that the operation seemed to be going
very favourably; the other, extreme indignation
the rapid and successful completion of it was
g prevented by the incompetence of the nursing-
. Perhaps it is that sickness simplifies one's uncon-
us system of elaboration. I have picked up a cold.

* * *

o the Nurses' and Midwives' Conference is to hear
ures on radioactive isotopes, Blalock's and Pott's
ations, leucotomy, the surgical treatment of coronary
mbosis, and similar subjects. How lucky the babies
he future will be to be brought into the world by
wives with this vital knowledge.

Letters to the Editor

CONTROL OF TUBERCULOSIS

SIR,—The hurricane is now blowing up over the reorganisation of the tuberculosis services; witness the sequelæ of Mr. Francis's article (*Lancet*, Sept. 24) in the *Times* and the recent speech of Sir Andrew Davidson.

What have we gained by the transfer from local authority to regional board? Firstly, the recognition that the tuberculous patient deserves a high level of skill in diagnosis and treatment, and that this can best be achieved by offering to the responsible physicians the possibility of a status and mode of work exactly comparable to that in other specialties: the efficient chest physician will, as the result of his clinical work, directly reduce wastage of his patient's life, and indirectly wastage of the lives of the patient's contacts. Secondly, we have gained the advantages of the planning and pooling of resources at regional level and the escape from the stagnant pool of some backward local authorities.

Much is now heard about the temptation for the chest physician to neglect the preventive aspects. I wonder if this is really valid. Many of my generation who were unattracted by what wrongly seemed to us the rather sterile duties of the medical officer of health, gladly became disciples of that wider aspect of prevention which has been attractively presented by Professor Ryle. A minority may have entered the tuberculosis services because they were unfitted alike for consultant work and for the hurly-burly of general practice, but presumably the great majority of permanent tuberculosis officers and chest physicians were, and are, clinicians with a natural vocation for what is now called social medicine.

Our work does not divide itself into two separate divisions; but we organise ourselves and our clerical staff so that justice is done to all aspects. It therefore makes no sense to be told that we must set aside x hours to coöperate with the medical officer of health; if the attitude is right, the coöperation is continuous and real, and time spent on pure "administration" is negligible.

It will be a retrograde step if the authorities decide that chest physicians are to be in direct contract with both regional boards and local authorities; we understand perfectly well the need for the closest liaison. A servant justly treated will happily serve one master and perform that master's wishes; he would resent his master arbitrarily paying him on two different scales for what is essentially all the same service. If a second master paid him on another scale, he would be mindful of the Biblical injunction.

On the preventive and environmental side we gladly do all we can, but the main factors are outside our control. We remain baffled by the administrative divorcement of health and housing at local-authority level.

Cheltenham. F. KNIGHTS.

SIR,—In his article of Sept. 24 Mr. Francis concludes that "data collected in a table indicate that B.C.G. may cause a fivefold reduction in the morbidity and mortality of tuberculosis." This (and other) evidence make unnecessary. he suggests, a "statistically satisfactory trial" in this country.

Being unfamiliar with one set of the data included in this table, I thought it wise to study it in the original.[1] This is what I found. The trial took place amongst Indian infants in Saskatchewan and the author's description of it is as follows:

> "B.C.G. vaccination of Indian infants was begun in 1933. All Indian infants born in the Qu'Appelle Indian Health

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[1] Ferguson R. G., Simes, A. B. *Tubercle*, 1949, 30, 5.

> Unit during the period October, 1933, to December, 1945, were considered for study. Follow-up information up to August, 1947, was studied. Families of comparable status in respect of housing, sanitation and certain other economic and social factors likely to affect the health of children were paired, and one member of each such pair was allotted at random to one of two groups, designated 'Group A' and 'Group B.' All children born into the families of *Group A were vaccinated in one year, while all children* born into families of Group B in the same year were taken as controls. In the following year this situation would be reversed and so on throughout the duration of the study. This procedure resulted over a period of years in groups of 306 vaccinated and 303 unvaccinated, which were balanced in respect of both age and environmental factors considered. . . . Infants were vaccinated within ten days of birth. . . . Both vaccinated and control children lived in a reservation environment where the infection rate was 68·7 per cent. at an average age of 9 years."

Amongst the 306 vaccinated infants there were 6 cases of tuberculosis with 2 deaths; amongst the 303 control infants 29 cases and 9 deaths—i.e., Mr. Francis's fivefold reduction. This is clearly an important difference, and Mr. Francis informs us that "every precaution appears to have been taken to make the groups comparable." Yet taking the authors' table IV it seems to me that the *infants in the trial must have been observed for the* following lengths of time:

Time observed, years	*Controls*	*Vaccinated*
Less than 1	42	15
1–2	23	18
2–3	27	13
3–4	20	18
4–5	27	29
5–6	23	21
6–7	24	11
7–8	13	23
8–9	21	15
9–10	21	18
10–11	9	27
11–12	16	21
12–13	2	39
13–14	21	2
14–15	14	0
	303	306

These figures appear very odd in more respects than one. As the first infants to be included were born in October, 1933, how can 14 controls have possibly been followed for 14–15 years by August, 1947? Far more disturbing still are the *gross* differences between the vaccinated and control children. Why, with the careful method of allocation laid down, should 35 control infants and only 2 vaccinated come into the groups watched for 13–15 years? Why, reversing the situation, should there be 39 vaccinated against 2 controls watched for 12–13 years? *And large differences may also be seen at other* points on the time-scale. Can such figures give the equality of age, &c., that is claimed both by the authors and Mr. Francis? Turning secondly to the environment, Ferguson and Simes give the following figures in their table III for the infection-rate year by year based on remainders:

Year	*Number remaining negative*	*Number turning positive*
1	157	10
2	147	10
3	137	6
4	131	16
5	115	7
6	108	11
7	97	10
8	87	7
9	80	7
10	73	6
11	67	3
12–15	64	15
		108

These figures are said to reveal "the infection rate among the controls using only those controls that had adequate tuberculin information." We may waive the point (to which incidentally no attention is paid) whether these cases are a representative sample of all the controls. For the main issue is, how do the authors come at all by 157 controls observed year by year for 15 years? There *is* no such group in their control data—indeed only 37 have been followed for more than 12 years. And why, on the basis of these figures, do they conclude that the "infection rate" was 68·7% (i.e., 108/157) "at an average age of 9 years"? The table quoted above clearly sets out a population for 15 years.

These are not statistical quibblings about ine
That the two groups to be compared are alike ex
the respect of B.C.G. vaccination is fundamental.
we should have accurate figures of the environm
desirable. Perhaps these two groups were
perhaps there are simple explanations of the discrep
to which I refer. But until we have those explana
the figures can command no confidence; the cri
reader must inevitably and wholly reject the cl
made for them.

I am not concerned here, I would stress, with
general body *of evidence in favour of (or against)*
I am concerned only that a particular piece of "evide
—and others like it—should not continually be ca
the face of those who think there is still in this cou
a case for the "statistically satisfactory trial"
Mr. Francis categorically rejects. And the fact that
evidence in favour of some other inoculation proce
is weak seems to me to be no adequate reason for ad
yet another to the list without measuring its potential

London School of Hygiene and
Tropical Medicine, Keppel Street,
London, W.C.1.

A. BRADFORD HI

SIR,—In his inspired article of Sept. 24, Mr. Fra
invoked medicine for an all-out offensive on tubercu
—a preventable disease.

A subsequent leading article and correspondence
the *Times* suggested that the chest physician and med
officer of health were not sufficiently active in
preventive field. The main preventive requireme
protection of the healthy from infection, and whilst
nation's nutrition remains sufficient, adequate hou
is a number-one health priority whose absence is
stumbling-block to all other *anti-tuberculosis* measu

The value of mass radiography is limited if infecti
cases cannot be adequately isolated. B.C.G. vaccinat
is reduced in value if, at the time of vaccination, the inf
is infected with virulent bacteria from another member
the household.

The chest physician and medical officer of health
continually uniting to obtain the bare necessities
housing conditions, but even in the case of kno
dangerously infectious households relief can only occ
sionally be obtained. For every known infectious c
there are many unknown. Inadequate housing of th
majority of the population—urban and rural—is probab
the *root* cause of many other diseases, organic a
functional.

In highly susceptible herds in some countries, tube
culosis has been eradicated by isolating infected a
infectious animals and providing a high standard
living-quarters for attested herds. In this country th
standard of living-quarters for attested herds has to b
maintained at a high level.

The living accommodation for the majority of th
people is inadequate *and does* not improve. Truly w
can learn from experience with animals. Homes for a
and no deterioration in the standard of nutrition mus
be more than an election promise if tuberculosis is t
be prevented.

AUBREY KAGAN.

Newent, Glos.

HOSPITAL POSTS FOR THE MIDDLE-AGED

SIR,—May I support the plea by "Psychiatrist"
in your issue of Sept. 17? As one who was not "taken
over" on the appointed day by the relevant hospital
board, I can testify that private practice is disappearing,
with consequent financial embarrassment.

A host of authoritative articles and letters have been
published in the leading professional journals, advocating
action in favour of the downgraded or "misgraded"
specialists, but no-one has yet drawn attention to the
plight of an appreciable group of middle-aged specialists
and consultants who for some reason or other are

d from the hospital services. To say the least. efensible to keep highly skilled men from working. the same time to complain about the long waiting- r admission and delays in outpatient appoint- ; it should surely be possible to increase the r of outpatient sessions. *Quousque tandem?*

SPECIALIST.

FORTITUDE OF A FŒTUS

—In some women surprisingly little trauma is l to precipitate an abortion. Operations on the inal organs have a bad reputation in this respect. eration for appendicitis is followed by abortion or ture labour in 40–80% of cases.[1] In the following wo operations were done for acute abdominal ions during pregnancy in a woman with a bad ric history. Though at one time abortion ened, the patient was eventually delivered of baby.

X, aged 29, was first seen on Nov. 16, 1947, when she dmitted to the Liverpool Royal Infirmary with an lix abscess. The only previous illness which she ed was trinitrotoluene poisoning in 1942. Her obstetric was that in 1939 she had given birth at term to a hich was stillborn and macerated for no known reason. 1946 she had been delivered of a stillborn baby at fter having had pre-eclampsia during that pregnancy. pendix abscess was treated conservatively, and after ys in hospital the patient was discharged with the to return in three months for an appendicectomy.

n the patient did return on April 7, 1948, she was about weeks' pregnant, her last menstrual period having l on Jan. 6, 1948. There were no symptoms or signs endix trouble. In view of the unfortunate obstetric it was decided, after discussion, to postpone appendi- y until after delivery. However, six weeks later the t was readmitted, with recurrence of her appendix s, and was again treated conservatively. At that time radiography of the abdomen revealed numerous bismuth on tracks in the buttocks, and further questioning d the fact that the patient had received an incomplete of treatment for secondary syphilis in 1945.

this occasion there was no response to conservative res, and therefore on June 1 a large retrocæcal appendix s was drained, under general anæsthesia, by Mr. Maurice tone. At operation there was some soiling of the eal cavity. The postoperative course was stormy. ay after operation the patient threatened to abort, ortly afterwards she developed paralytic ileus. These cations were treated with morphine, gastric aspiration, travenous fluids. Progesterone was not given. After days peristalsis re-started and the patient's general ion steadily improved. The following week fœtal nents were felt for the first time. Sulphonamides and llin (16,400,000 units in 24 days) were given in the post- ive period. The discharge from the abscess ceased after eeks, and the patient was transferred to a convalescent

The pregnancy was then progressing normally. The Wassermann reaction was negative, but it was intended er the patient to a venereologist on her return from the lescent home.

July 18, however, she was readmitted, as an emergency with acute obstruction of small bowel. The uterus ponded in size to a 26-week pregnancy, and fœtal move- s were felt. It was thought that the cause of the obstruc- as a kink in the terminal ileum, which had been produced e enlarging uterus and adhesions in the right iliac fossa. w of the possibility that re-exploration of the appendix night light up a latent infection or precipitate abortion sturbing the uterus it was decided to do a short-circuiting tion. Accordingly on July 20 a side-to-side anastomosis en the terminal ileum and the transverse colon was done general anæsthesia, by Mr. Silverstone. Except for œa, which persisted for a week, the postoperative course neventful, and the patient was discharged from hospital ug. 1.

anwhile the pregnancy proceeded uneventfully, except ild hydramnios. On the advice of the venereologist, Dr. A. O. F. Ross, the patient was given penicillin 4,200,000 units in ten days. This was to be followed by 'Stabilarsan' 0·45 g. weekly until the end of the pregnancy, but only two injections of arsenic were in fact given.

She was admitted to the maternity ward on Oct. 1 in premature labour. She was very apprehensive—not unnaturally, in view of her previous obstetric history—and her apprehension was reflected in the incoördinate uterine action which marked her labour. The baby was eventually extracted with forceps, face to pubes, under local anæsthesia, the indications being secondary uterine inertia and small but persistent intrapartum hæmorrhage. At the end of the second stage intravenous ergometrine 0·5 mg. was given, and the placenta was delivered with the next contraction. However, a true atonic postpartum hæmorrhage followed, and a pint of matched blood was transfused. The intrapartum hæmorrhage, together with the postpartum loss, were most probably due to a lateral placenta prævia, but it was impossible to prove this.

The baby, a male, weighed 5 lb. 2 oz. and was judged to be of 38 weeks' maturity. He had asphyxia pallida at birth but responded to treatment, and when seen three months later had made satisfactory progress.

To summarise, this woman became pregnant after having had syphilis (incompletely treated), pre-eclampsia, and two stillbirths. After drainage of an appendix abscess she developed paralytic ileus and threatened to abort, and finally she underwent an operation for the relief of acute small-bowel obstruction, all within a span of 8 weeks. The child survived, during labour, an intrapartum hæmorrhage and secondary uterine inertia and, immediately after birth, asphyxia pallida.

We wish to thank Prof. C. A. Wells, Mr. M. Silverstone, and Prof. T. N. A. Jeffcoate, under whose care the patient was, for permission to publish this case.

S. BENDER
Clinical Assistant.
R. B. WELBOURN
Surgical Registrar.

Liverpool Royal Infirmary.

CONCENTRATION OF DIPHTHERIA ANTITOXIN IN CORD BLOOD

SIR,—I cannot let Dr. Wiener's latest letter, which appeared last week, pass without comment.

I am glad that he has withdrawn his suggestion that the differences in antitoxic titre recorded between cord and maternal blood are too small to be significant; but he now suggests that the results might be affected by bias in the setting up of the experiment. A little consideration of the details given in my last letter should have shown him that this was highly improbable. We also have long series of thousands of records which show that the variation from guineapig to guineapig is not significantly greater than the variation between identical tests on the same guineapig. It is abundantly clear that Dr. Wiener is basing his criticism on his own experience of the much less accurate type of serological test with which he is familiar.

As regards our titrations, in the first place the cord and maternal samples were received at the same time and were therefore tested in parallel on one day using one animal, and the tests were repeated likewise. However, since there is no significant animal variation and the test toxin is always controlled by means of two standard sera, this particular "precaution" would be quite unnecessary. Nevertheless I accept Dr. Wiener's challenge by making available to him the protocols of the last set of tests made on mother's and cord blood samples:

Date, Sept.	*Guineapig*	*Antitoxin (units per ml.)* *Mother's blood*	*Antitoxin (units per ml.)* *Cord blood*
23	Same	18–22	36
24	Another	18–22	36–45
27	Another	20–22	>40
28	Another	..	40; <45

An earlier sample of the mother's blood, taken seven days before delivery, had the same value as this sample which was taken during labour. On the same four days tests on the two standard sera tested at 10% differences gave the following results: (*a*) 95, 95, 95, 88 units per ml.; (*b*) 2·07, 1·90, 2·10, 1·93 units per ml.

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[1] r, J. L., Reis, R. A., Arens, R. A. *J. Amer. med. Ass.* 1932, 8, 1359.

Thus we found in this series of three tests that the mother's serum failed each time to pass tests for 22 units but was over 18 or 20 units, whereas the serum from the cord blood was over 36 units on each of the four occasions it was tested. The values allotted were 21 and 41 units respectively, and the high titres were due to the fact that the mother had been immunised earlier in pregnancy.

In conclusion I would suggest a better idea than Dr. Wiener's as to the relation between theory and observation: when an observation of undoubted accuracy conflicts with "an excellent theory," it is also a good thing to re-examine the theory. As yet we have no theory to account for the phenomenon, but we are continuing the investigation—giving due consideration to any points on the practical side which might throw light on the matter.

Wellcome Research Laboratories,
Beckenham, Kent.
MOLLIE BARR.

VASCULAR STASIS

SIR,—I read with great interest last week's letter on vascular stasis by Professor Kreyberg, of Oslo, and your annotation; and I should like to support the plea for further study of this phenomenon.

At this unit an investigation of experimental and clinical burns is in progress, and we have found evidence that the inflammatory reaction plays an important part in influencing the course of burns.

During a recent study[1] of experimental burns of known temperature applied for known periods in guineapigs, the permeability and qualitative blood-flow changes in the skin were investigated by the use of circulating Evans blue and/or brilliant vital-red injected before and after burning. It was shown: (1) that continuation of the dermal blood-flow in burned skin was accompanied by normal skin sensation, by the absence of marked œdema, and by the absence of subsequent whole-skin loss; (2) that the development of stasis of the local blood-flow in the dermis was preceded by marked œdema, was associated with analgesia, and was followed by whole-skin loss.

Further, evidence has been provided of the existence of a threshold dermal temperature, below which stasis does not occur. If, however, the dermis is heated to or beyond this temperature during burning, stasis of the dermal vessels develops. The time of onset of stasis decreases with increasing severity of burning. Stasis is preceded by a period during which slowing of the blood-flow progresses to extreme retardation or stagnation (prestasis of Kreyberg). During this period the vessels are freely permeable and œdema develops.

In our experience, stasis throughout the depth of the dermis in guineapig burns is invariably followed by whole-skin loss, and this would suggest that the change is normally irreversible. However, in a number of burns in which stagnation of the blood-flow was detected, partial, and not whole-skin, loss took place. This suggests that stagnation was not followed by stasis, or that if stasis did develop it was localised to the superficial part of the dermis.

Investigations are in progress with the aim of discovering how to influence these vascular changes. Various anti-histamine drugs have failed to influence the capillary-permeability and blood-flow changes in experimental guineapig burns of all degrees.[2]

In my opinion—and no doubt Dr. Kreyberg will [illegible] and stasis, when they occur, are part [illegible] y reaction, and any investigation into their nature and cause must take the whole into account.

Finally, I should like to comment on Kreyberg's choice of the word "prestasis" for retardation of the blood-flow. This word imp the condition invariably ends in stasis, Professor Kreyberg agrees that this is not true. In my opinion the word "stagnation" is from this criticism and is therefore to be preferred.

M.R.C. Burns Research Unit,
Birmingham Accident Hospital.
S. S

AN EPIDEMIC OF ACUTE NEPHRITIS

SIR,—I read with great interest Dr. Fleming's in your issue of May 7.

As physician in charge of the outpatient clinic of Transjordanian Red Crescent Society in Amman, I the same problem of an epidemic of acute nephritis infants of the Palestine Arab refugees.

In my private clinic in Amman, I have during the thirty months seen only three cases of acute neph But in the seven months between October, 1948, April, 1949, I saw more than one hundred cases of nephritis among the refugee children. This preval was due perhaps to the bad conditions under which refugees were living (most of them were in tents or ca and to the extremely cold and damp weather.

I did not have the advantage of a well-equip laboratory, nor enough beds in the hospital, to investig these cases fully, but the following features were not (1) most of the cases were in females; (2) their age usually under 3 years; and (3) commonly they had a course of sulphadiazine in the preceding two weeks inflammation of nasopharynx, otitis media, pneumo or diarrhœa. The diagnosis of acute nephritis based on the presence of œdema and albuminuria with without fever.

In the early cases of this series treatment consisted the start in routine dietetic and diuretic measures, wh had very little effect. When, after fifteen days, the con tion was not greatly improved, I injected 200,000 uni of penicillin once daily for three successive days. T improvement was so striking that I treated subseque cases with penicillin as soon as the diagnosis was made in the majority cure was complete within one week.

This experience contrasts with that of Dr. Fleming But I believe that had he used greater amounts of peni cillin, or subdivided the dose into smaller amounts give at shorter intervals, his results would have been different

M. RAZZAZ.

Amman, Transjordan.

PURIFIED TOXINS FROM COBRA AND BEE

SIR,—I have developed a technique for preparing in potent amorphous and crystalline form the venom from the cobra (*Naja tripudians*).

The cobra is allowed to bite a rubber membrane covering a small beaker. The venom thus collected, which consists of about 1 ml. of viscid, clear, transparent liquid, is diluted 100 times with physiological saline solution. It is clarified by adding a little aluminium sulphate and lime water; and toxin is then precipitated by the addition of pure acetone. The precipitate is centrifuged, washed with acetone and then with ether, and finally dried in vacuo, leaving the toxin as a white amorphous substance. Alternatively the precipitate may be concentrated by evaporation under reduced pressure at 30°C and the toxin crystallised by drying in vacuo over phosphorus pentoxide. One bite produces 104 mg. of the final crystalline toxin.

This crystalline material is strongly active when injected subcutaneously into rats; 0·03 mg. is sufficient to kill an albino rat of 100 g. body-weight.

A second method of preparation is as follows:

The venom, which is collected as in the first method, is diluted 100 times with $N/10$ hydrochloric acid and is then neutralised with normal caustic soda; a saturated aqueous

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1. Sevitt, S. *J. Path. Bact.* (in the press).
2. Sevitt, S. *Brit. J. exp. Path.* (in the press).

ı of picric acid is added and the liquid allowed to stand hours. The supernatant fluid is poured off and the ng precipitate containing the toxin is repeatedly ed with 80% acetone in water until no further picrate ered. The toxin is then precipitated as hydrochloride ing a few drops of concentrated hydrochloric acid and ess of acetone to the 80% acetone extracts. The recipitate is centrifuged off, washed successively with e and ether, and kept in vacuo over phosphorus pent- The potency of this toxin, in terms of the minimal dose for the rat, was about 0·03 mg. per 100 g. eight.

resulting purified "toxin" dissolves readily in d water to give a clear solution. With an aqueous n containing 1 mg. per ml., the Millon, xantho- c, and biuret reactions were positive. There was recipitation on boiling or half-saturation with nium sulphate. (Half-saturation with ammonium ate produced a small flocculent precipitate which on-toxic in a solution containing 4 mg. per ml.). oxin was completely precipitated by full saturation ammonium sulphate, by absolute alcohol, and by he. Picric acid gave a precipitate which dissolved ating and reappeared on cooling. The substance's al behaviour was that of a proteose. Burning of ried toxin left no residue.

e Toxin.—I have also prepared toxin from the hive- *Apis mellifica*) in amorphous form, as follows:

sh telsons are mixed with a small quantity of quartz moistened with 1–2 ml. of *N*/10 hydrochloric acid, ground thoroughly in a mortar for about half an hour. finely ground mass is extracted with *N*/10 hydrochloric using 30 ml. at a time. Five extractions are sufficient move all the toxin. The insoluble residue is decanted; the combined decanted extracts are neutralised by ng with normal caustic soda. The toxin is precipitated crate by adding saturated picric-acid solution and allow- the mixture to stand for 24 hours. The clear liquid is nted and the residue extracted with 80% acetone; al extractions are necessary to remove all the soluble ate. The toxin is further converted into a hydrochloride recipitation of the combined extracts through the addition n excess of pure acetone and a few drops of concentrated rochloric acid. The precipitate is centrifuged and red, washed first with more acetone and then with ether, finally dried in vacuo.

AHMED HASSAN MOHAMMED.

hysiology Department, Abbassia Medical
Faculty, Fuad I University, Cairo.

B$_{12}$ DIURESIS

IR,—A rather profuse diuresis frequently attends the ninistration of liver extract to patients with addisonian emia in relapse. Diuresis has likewise been noticed ere the therapeutic agent is crystalline vitamin B$_{12}$. e explanation usually offered for the diuresis of nitting addisonian anæmia—that the hæmatocrit es at the expense of the circulating plasma-volume d that the latter must recede by water elimination— es not accord with the fact that the hæmatocrit (by a reversion of macrocytosis) during l of therapy when diuresis takes place. mission of non-addisonian anæmia is by water retention.

Cobalt, a constituent of vitamin B$_{12}$, is said to have a uretic effect,[1] as does a liver diet instituted for the eatment of nephrosis.[2] One [3] of us had reported profuse iuresis in a uræmic patient given an experimental liver reparation of high reticulocytogenic activity.

Our decision to determine possible diuretic effects of itamin B$_{12}$ in non-anæmic subjects arose from an bservation on an amyotrophic patient who on adrenal- ortex therapy developed water retention. The injection of 15 µg. of vitamin B$_{12}$ in solution was followed by ubsidence of œdema within a few hours in face of the continued administration of adrenal-cortex extract. Subsequent observations on this patient indicated that a possible diuretic effect of vitamin B$_{12}$ should be explored.

Of 16 patients with essentially normal blood pictures who were given 45–75 µg. of the vitamin in a single injection, 12 responded during the ensuing twenty-four hours with what was felt to be an unequivocal increase in urinary output, comparison being made to control periods immediately before and remotely after administration. Of these 12 patients, 1 had amyotrophic lateral sclerosis, 3 chronic glomerulonephritis, 4 addisonian anæmia in remission, and 1 cardiac decompensation; 3 were normal volunteers. Another 2 volunteers and 2 further patients with cardiac decompensation did not show a definite response.

While we have no evidence of the nature of the diuresis induced by vitamin B$_{12}$, a clue to the mechanism may be found in the fact that diuresis has been found to accompany the peripheral vasodilation ("cobalt flush") seen in occasional patients receiving more than the ordinary parenteral dose of B$_{12}$. Le Goff attributed cobalt flush to the sympathomimesis of cobalt salts, and if his explanation is correct one might expect a similar dilation of the glomerulo-afferent arterioles. Purely from speculative considerations, we are tempted to accept Le Goff's explanation because of the entrancing possibility that cobalt or a cobaltoporphyrin is either the prosthetic nucleus of, or a cofactor of, the enzyme cholinesterase. Potentiation or enforcement of the enzyme might be a mode of sympathomimesis.

Whatever the explanation of cobalt or B$_{12}$ diuresis, the latter does not seem to be contingent upon changes in hæmatomorphology. Possible clinical utility of B$_{12}$-induced diuresis might be worthy of investigation.

ROBERT D. BARNARD
New York. HERBERT A. WEITZNER.

RADIOTHERAPY IN LEUKÆMIA

SIR,—Your annotation of Oct. 1 suggests, at least by implication, that the most valuable method of treatment of chronic leukæmia is irradiation, although admittedly, as an afterthought, there is a suggestion that nitrogen mustard may be as efficacious.

In my opinion it is of the utmost importance to realise that arsenic administered by mouth is one of the most valuable—perhaps the most valuable—method of treatment of early cases. It is of course well known that every method of treating leukæmia loses its efficacy sooner or later. It is therefore important to employ the mildest method which will produce a good result, even if its effect is slowly manifested. Admittedly the radiotherapist can produce remarkable changes in the physical signs and in the blood picture in cases of chronic leukæmia, while often greatly improving the patient's health; but when his method of treatment fails, there are no other "shots in the locker." If, however, treatment is started with arsenic, health may often be preserved for months or even years before radiotherapy becomes essential.

It is peculiar that the fashion for using arsenic varies so much from time to time. Naegeli advocated its use as the main standby in the treatment of chronic leukæmia, but then the rise of radiotherapy caused it to be relegated to a very secondary position. In 1931, Forkner and Scott[1] again made arsenic a popular therapeutic agent, but today the impressive complexity of radiotherapeutic technique and the quick (although usually transient) results undoubtedly have caused many people to take the retrograde step of commencing treatment with irradiation.

I would be prepared to state categorically that for chronic myeloid leukæmia, where the patient's general condition is reasonably good, the correct treatment is *graduated doses of Fowler's solution by mouth; and in* such a case it is wrong to start treatment by irradiation earlier than is absolutely necessary.

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[1] Le Goff, J. M. *J. Pharmacol.* 1930, 38, 1.
[2] Grossmann, M. *Wien. klin. Wschr.* 1928, 41, 450.
[3] Barnard, R. D. *Eye, Ear, Nose, and Throat Monthly*, 1940, 19, 176.

[1] Forkner, C. E., Scott, T. F. M. *J. Amer. med. Ass.* 1931, 97, 3.

London, W.1. A. PINEY.

EFFECT OF COOLING ON "SPREADING" ACTION OF HYALURONIDASE

SIR,—In the course of our studies on the anti-hyaluronidase action of gentisic acid, various observations caused us to consider the possibility that the in-vivo action of the enzyme could be influenced by local modification of the body-temperature.

Using the Duran Reynals method of intradermal diffusion of a dye, we observed in adult white rabbits which had been previously depilated that local cooling of the skin with an ice-bag increased the "spreading" effect of hyaluronidase to the extent of 50–70%. The application of a bag filled with water at room-temperature or heated to 45°C had no detectable effect. In all cases control observations were made on the opposite side.

This effect could be due to the vasoconstrictor action of cold and to the consequent local diminution of the serum anti-hyaluronidase substance.[1] In our belief the phenomenon might explain why, in the origin of the common cold, cooling favours penetration by the virus.

Cátedra de Farmacología, Facultad de Medicina, Barcelona.

P. PUIG MUSET
J. A. SALVA
F. G.-VALDECASAS

THE REGISTRAR'S SALARY

SIR,—You must surely be wrong in your admonition to Dr. Gee (Sept. 24). He has done no more than protest at the injustice of being yet unable to earn a living after a decade devoted to the study of medicine. The bland statement that things have ever been so is the most maddening complacency a young man can meet. It is sad to have it come from the Editor of THE LANCET.

I admit that in the past the young specialist has always had a lean time until he became established. In the past children were driven to work in factories but we do not regard that precedent as hallowed today. Moreover a change has occurred in the essential nature of the process of specialisation. In former times the trainee specialist looked forward to a very splendid reward for his asceticism. A Rolls-Royce, consulting-rooms in Harley Street, and a fine country home were his in the fullness of time by the exercise of reasonable diligence and intelligence. We regret the departure of these pleasant prospects from the order of things; but not excessively. We should settle very gladly for a modest security now.

Surely the most pertinent reason today for specialising is individual interest and ability. I just do not happen to have the type of mind that can pass with interest and satisfaction from an intestinal carcinoma to a cut finger, from a howling baby to a malingering workman. I envy those whose natures are thus constituted but fail to see why I should be penalised for my single-mindedness.

Very nearly every week one or another of your correspondents points out, "what is wrong with British medicine." I have very seldom seen the same thing blamed twice. By now the range of the fons et origo mali must be staggering. I should bet Mr. Bevan leads by a short head, but I should like to add one to the list —old men. In all humility I submit that British medicine today is carrying an intolerable burden of old men—men whose imaginations have atrophied with the passage of years. Men who, inter alia, say blandly; "I had a hard time before I became established. Good healthy discipline for these young pups to work their way up, through the lean years." They have quite forgotten the bitterness of those lean years. If they ever knew, they *gotten the humiliation of the tawdry devices* one lives when one's social and intellectual higher than the financial. Besides, the world they cope with and the one we live in are really di The majority of them had private means; the m of us are engaged in the disreputable pursuit of h ourselves up by the boot-straps. We have lost the of the war and are older. Very many of us have and children; and many more should, for we are a valuable class. If the old men have their way, children of those of us who do propagate will be exh products.

I have a deep respect for the clinical acumen wisdom of my teachers, many of whom helped fram scales that govern our living today. But it needs to said quite bluntly that they have been lacking in hu understanding. Was there, on any one of the innumer *committees that sat to determine our fate*, one houseman or registrar? Or even one man under Almost certainly not.

It is sad to have THE LANCET wag an atrop grandfatherly finger at us. Perhaps you might recon relent, and turn to plead our cause?

British Hospital for Mothers and Babies, London, S.E.18.

ARNOLD KLOPP

SIR,—Dr. Lipscomb has written a good ar (Sept. 17). The correspondence arising out of it is more interesting. But the registrar is not the impor man in the team; he is the nonentity. Proof of this will find in the way he is paid, for his gross is ab one-third of the figure that Spens said the gen practitioner should expect net at 1939 values.

In deciding to abandon hospital, Dr. Gee (Sept. must have realised this, but he may find himself *more happily placed in general practice* in the new or Lip service used to be paid to the family doctor; transferring it to the registrar there must be some ou but I cannot read it. Will the registrar develop imp tance, with reward in proportion, or will he be another cog in a wheel with an enormous number cogs—a well-trained member of the chorus in the seco row?

A. ROTHWELL.

Salford.

PENICILLIN IN THE CEREBROSPINAL FLUID

SIR,—In their article last week Dr. Redfearn and colleagues showed that when penicillin is injected intr muscularly in sufficiently high dosage it is able to pen trate the uninflamed blood/cerebrospinal-fluid barri They mention that previous demonstrations of th ability of penicillin to enter the cerebrospinal fluid hav been criticised on the grounds that the permeability the barrier might have been increased by abnormalit —e.g., syphilis—in the patients studied.

This calls to mind certain observations made by m colleagues and myself in Liverpool some years ago. We also found, in the rabbit and in man, that penicill is able to breach the normal blood/cerebrospinal-flui barrier if it is administered intramuscularly in sufficie dosage. For the observations in man (though admittedly in only 3 subjects) we purposely chose cases of uncom plicated gonorrhœal urethritis, and not of syphilis, that a normal barrier might safely be assumed.

In regard to the treatment of syphilis, Eagle and Musselman[2] claimed that penicillin blood-concentrations above a very moderate *threshold-level* are no more spirochæticidal in vitro than at that level. This work is often quoted as establishing the futility of high doses of penicillin for the treatment of syphilis. Nevertheless we have advocated massive dosage, and our observations

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[1] Wattenberg, L. W., Glick, F. *J. biol. Chem.* 1949, 179, 1213.

[1] Lourie, E. M., Collier, H. O. J., Ross, A. O. F., Nelson, R. B., Robinson, D. T. *Lancet*, 1945, ii, 696.

[2] Eagle, H., Musselman, A. D. *J. exp. Med.* 1944, 80, 493

penetration of penicillin into the normal cerebro-
luid formed part of the experimental evidence on
ur arguments were based. Merely for reasons of
ence and accessibility, the intrathecal space was
as a representative of those tissue-spaces in
which might ordinarily not be reached by peni-
dministered in moderate doses. The fact that it
ly after massive dosage that penicillin could
ate into the cerebrospinal fluid was therefore
t forward to support the case for such dosage
tages of syphilis, "since the organisms are to be
ed not merely in the circulating blood but also
nanner of extravascular sites to which they may
ained access."

tment of Pharmacology, Oxford. E. M. LOURIE.

REATMENT OF ACCIDENTAL ARSENICAL POISONING WITH DIMERCAPROL

—Dimercaprol (BAL) now has an established place
treatment of toxicity from parenterally adminis-
arsenical compounds. The following account of
e of the drug to treat acute arsenical poisoning due
swallowing of arsenical cattle-dip may be of interest.

arty of 13 African women was working by the side of a
making bricks to be used in building a tank for
g cattle. To make the brick clay into the proper
tence for placing in the brick moulds, water was being
d up from the stream in a number of receptacles—
used cattle-dip drums of about 4-gallon capacity.
about 10 A.M. it was getting hot, and one of the women
ent to the stream to fetch water for drinking. For this
ook a dip drum which was empty but had not been
d and scrubbed. She washed the drum in the stream
perfunctory way and brought the water to the brick-
ng site. where all the women slaked their thirst.
hin a few minutes the whole party was vomiting. and
n half an hour 2 of the women were collapsed. They
ed that they had been poisoned and sent for help.
were many miles from the nearest telephone and about
les from the hospital, which they did not reach until 5 P.M.
admission 11 of the women. though still vomiting and
laining of abdominal pain. were able to walk and to
a clear history, and were obviously recovering. In hospital
vomiting soon grew less. and they continued to improve.
remaining 2. however. were completely collapsed. It was
n that they were the last to drink from the drum, and
umably they drank the dregs. Each complained of
ea and vomiting. violent abdominal cramps. pains in the
and precordial pain. They cried out with each spasm of
; so. in view of the usual African stoicism. the pain must
been very severe indeed. Their skin was cold and grey:
r conjunctivæ were suffused and their tongues dry; and
r pulses were feeble.
was decided that in view of the delay since the arsenic
been consumed there was little point in washing out the
nach; detoxication was the urgent need. The patients
e kept warm and nikethamide was given subcutaneously.
ercaprol was given in 2 ml. doses intramuscularly three
es at four-hourly intervals—i.e., at 5.30 and 9.30 P.M. and
1.30 A.M.
Next morning the general condition of both patients was
ch improved; they were no longer collapsed. vomiting
d ceased, and the abdominal pains were only occasional
d fleeting. Twenty-four hours afterwards they were fully
overed and were out of bed: and the next day they
ounced that they were well and insisted on leaving hospital.

The drum from which the women had drunk was
ught in for inspection. It was clearly marked "cattle-
p." The liquid in the bottom was dark brown and
d the characteristic odour of cattle-dip.

Cattle-dip consists of a solution or emulsion of arsenite
soda to which has been added some substance such as
loes to prevent the cattle drinking it. In concentrated
olution in the drum the sodium-arsenite content is
bout 80%—or 64% expressed as arsenic trioxide. For
ipping cattle to kill ticks, the concentrated solution is
iluted 1 in 400 so that the final solution contains the
quivalent of 0·16% arsenic trioxide. There seems little doubt that the two women who were seriously ill must have ingested a very large dose of arsenic.

Where there is any delay between the accidental swallowing of arsenic and the institution of first-aid measures, such as washing out the stomach, dimercaprol would seem to be a very useful drug for countering the effect of the absorbed arsenic, giving results no less dramatic than in poisoning arising after parenteral administration of the organic arsenicals.

Concession, Southern Rhodesia. D. A. W. RITTEY.

LEAD NIPPLE-SHIELDS

SIR,—I have read with interest and great care your leading article last week and the article by Dr. Gordon and Mr. Whitehead. The embargo by the Ministry of Health on the sale of lead nipple-shields must be a source of satisfaction to you, since you recommend their abolition. Has it occurred to you that a valuable aid to breast-feeding has thus been abolished, and is this also a source of satisfaction?

In certain cases lead nipple-shields are a unique aid to breast-feeding: they have enabled me to feed each of three babies for a normal period of nine months, when all other remedies had failed to relieve severely cracked nipples. For a fourth child, the Ministry's embargo will compel me to wean at a few days old.

I see no justification for such action in Dr. Gordon's article. In the case cited he expressly states that the mother used lead shields continuously without washing her nipples before each feed. This only justifies a warning that scrupulous cleanliness is necessary when using lead shields. The possibility of lead deposits being absorbed and then excreted with the milk is a mere suggestion which, Dr. Gordon states, he has never investigated.

The letter in your columns from Dr. Mackay and Dr. Hunter yields even less precise evidence. They assert that the use of lead shields necessitates a meal of lead for the suckling child. Have they never heard of the simple precaution of washing? The suggestion that plastic shields can replace lead ones is frivolous; no-one who has observed the effect of lead shields with intelligence can doubt that the deposits from the lead are a valuable part of their healing power.

"The facts" of this controversy are more teasing and elusive than you or your correspondents indicate. May one hope that the humility which should inform all research may lead you to investigate the matter further?

Pilton, Barnstaple, Devon. JOAN S. BLACKSELL.

Public Health

Setback in Scottish Campaign Against Diphtheria

IN Scotland the campaign for protection against diphtheria has suffered a serious setback. The October number of the *Health Bulletin* issued by the Department of Health contains an analysis showing that at the end of 1948 51·4% of preschool children and 73·4% of school-children were protected. (About 12–13% of babies in the preschool group are too young for inoculation.) Both these percentages are higher than a year before: but in the second half of 1948: (1) the number of preschool children inoculated fell somewhat: (2) the number of school-children inoculated fell dramatically to a much lower level than in any six months since the campaign started; and (3) the number of reinforcing doses given fell to just over half the number in the previous six months.

Nothing, says the bulletin, has happened to discredit immunisation, and the disease is not yet so rare as to delude the public into believing that protection is unnecessary; moreover, there has been no great change in central propaganda.

During 1948 there was increasing shortage of local-authority personnel—"a shortage which, in the case of medical staff, was intensified by a number of health officers obtaining appointments under regional hospital boards." That this shortage largely explains the decline in the number of inoculations has been corroborated by comparing local figures for inoculations with those for staff.

> "The highly significant association between dwindling numbers of inoculations and increasing shortages of assistant medical officers of health implies either that the two items are causally related or that both are due to some common cause; but the causes of the shortage of public-health doctors are well enough known—depletion of existing complements by retirals and by doctors quitting the field of public health, and difficulty in obtaining doctors with qualifications to fill these vacancies. Hence it must be concluded that an important cause of the decline in the number of inoculations is shortage of public-health doctors."

During 1948 diphtheria cases in Scotland numbered 723—the lowest total ever recorded. The number of deaths was 31—just under 6% of the number in 1941.

Higher Mortality from Rheumatic Fever

Earlier this year we heard of an impression among pathologists that the number of necropsies on cases of *acute rheumatic fever was increasing.* We consulted the General Register Office, which has kindly supplied the following figures for deaths from rheumatic fever in England and Wales during the years 1946–48:

Age, years	*Males* *1946*	*1947*	*1948*	*Females* *1946*	*1947*	*1948*
0–	1	nil	nil	1	1	3
1–	7	5	15	10	11	11
5–	28	30	31	31	38	41
10–	45	41	42	36	47	53
15–	26	21	25	17	18	25
20–	15	10	9	13	14	22
25–	6	12	7	13	11	8
30–	2	13	5	7	11	13
35–	7	12	12	15	14	7
40–	10	8	8	9	8	10
45–	10	9	9	10	5	11
50–	4	5	6	6	4	6
55–	5	5	9	8	8	7
60–	4	5	8	7	1	3
65–	nil	4	7	1	10	6
70–	1	4	2	nil	1	5
75–	1	3	5	1	2	6
80–	nil	nil	2	nil	1	nil
85–	nil	1	1	nil	1	nil
All ages	174	188	206	188	206	210

The death-rates from this cause per million population for certain groups were as follows:

Year	*Under 15 years,* *Male*	*Female*	*Male and female*	*15–25 years, Female*
1946	18·1	18·1	18·1	9·9
1947	16·3	21·7	19·0	10·8
1948	19·1	24·3	21·7	16·0

For the forty years ending 1892 the mean death-rate from rheumatic fever was about 87 per 1,000,000—seven times that of 1942. In 1901 the crude death-rate per 1,000,000 was 67, and by 1913 it had fallen to 48.[1] Since 1925 the rate has fallen more or less steadily. The following tables give the figures for deaths in each year from 1928 to 1938,[2] and from 1938 to 1948[3]:

	Year *1928*	*1929*	*1930*	*1931*	*1932*	*1933*
Males	638	638	693	557	491	589
Females	862	779	812	703	627	718
Total	1500	1417	1505	1260	1118	1307

	Year *1934*	*1935*	*1936*	*1937*	*1938*
Males	594	526	535	395	511
Females	793	649	607	522	644
Total	1387	1175	1142	917	1155

	Year *1938*	*1939*	*1940*	*1941*	*1942*	*1943*
Males	490	427	349	298	218	254
Females	614	527	491	333	275	399
Total	1104	954	840	631	493	653

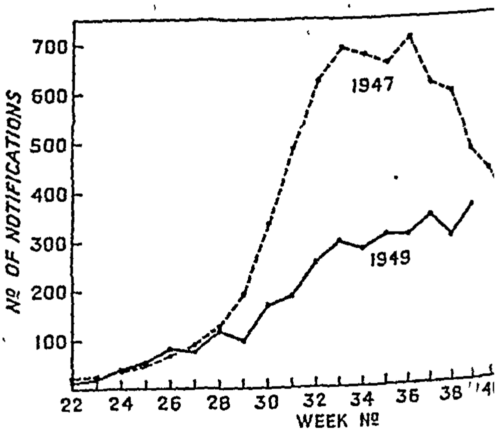
	Year *1944*	*1945*	*1946*	*1947*	*1948*
Males	290	256	174	188	206
Females	328	281	188	206	210
Total	*618*	*510*	*362*	*394*	*416*

It will be seen from these figures (which non-civilian males from Sept. 3, 1939, and non females from June 1, 1941) that though the annı of deaths has risen during the past two y remains below that for 1945.

During the late war, Glover,[1] who drew atte the parallelism between the death-rates from fever and rheumatic fever, suggested that the co decline in deaths from rheumatic fever might be to improved environmental conditions than to a relation between man and *Streptococcus pyoge* will be recalled that by regulations[4] made two y acute rheumatism is notifiable in Lindsey (Linc and in Bristol, Grimsby, Lincoln, and Sheffiel perhaps the epidemiological study which these re have made possible will help to explain the setback. Though more sustained, this is not as that suffered between 1942 and 1943; and possible that, as in *1944, the interrupted dec* be resumed.

Poliomyelitis

During the week ended Oct. 1 notifications in and Wales were: poliomyelitis 331 (268) encephalitis 26 (27). The numbers for the week are shown in parentheses. As the accon figure shows, these are the highest weekly t



Notifications of poliomyelitis and polioencephali

year. In 1947 the totals for the correspond were poliomyelitis 441, polioencephalitis 32.

Multiple cases (poliomyelitis and polioen together) were reported from the following London 44 (48), Bedford 5 (1), Berkshire 5 (3), ham 2 (1), Chester 4 (7), Cornwall 8 (8), Dor Durham 3 (1), Essex 26 (17), Gloucester 17 (0), 12 (7), Kent 19 (18), Lancaster 41 (24), Leices Norfolk 4 (2), Northampton 4 (4), Northumberla Nottingham 9 (9), Somerset 6 (7), Southampt Suffolk, East 2 (5), Surrey 9 (11), Sussex, Ea Warwick 13 (8), Wiltshire 8 (9), Yorks, Eas 3 (1), Yorks, North Riding 2 (1), Yorks, Wes 38 (19), Glamorgan 6 (3), Monmouth 2 (0).

Insurance Against Tuberculosis

Whether tuberculosis in nurses and othe workers should be a "prescribed disease" u National Insurance (Industrial Injuries) Act considered by the industrial diseases subcom the Industrial Injuries Advisory Council. Per bodies interested in this question are invited t written evidence, not later than Dec. 1, to the secretary, Mr. F. K. Forrester, Ministry of Insurance, 6, Curzon Street, London, W.1, fro an explanatory memorandum may be obtained.

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1. Glover, J. A. *Lancet*, 1943, ii, 51.
2. Registrar-General's Statistical Review of England and Wales for the Year 1938. Tables. Part I. Medical. H.M. Stationery Office, 1940.
3. The figures for the years 1938–47 are taken from the Registrar-General's Statistical Review for 1947. The criteria differ slightly from those used in compiling the figures for 1928–38; and this accounts for the difference between the two tables in the number of deaths in 1938.
4. See *Lancet*, 1947, ii, 394, 409.

Obituary

MAJOR GREENWOOD

D.SC. LOND., F.R.C.P., F.R.S.

Major Greenwood, professor emeritus of epidemio- nd vital statistics in the University of London. n Oct. 5 at the age of 69.

father and his grandfather both practised medicine East End of London, and he shared, rather ntly, their unusual Christian name, which he red to abbreviate to its initial letter. An only he grew up in an intellectual home, for his father ot only a doctor and deputy coroner but also a f learning and a writer, while his mother was a ian and a linguist. From Merchant Taylors' l he went with a Buxton scholarship in 1898 to sity College, and later he completed his medical s at the London Hospital, whence he took the int qualification in 1904. For some months he as assistant to his father, but became demonstrator in physio- t the London under Sir Leonard with whom he collaborated n investigation into caisson se. Later he declared that these years made him the kind of r he became. "As a boy," he . "I lived in the atmosphere n East End general practice: very young man I spent four y years as the assistant of a great physiologist." But he already attracted to statistics. in 1910, the year in which he appointed statistician to the er Institute, his publications on Physiology of the Special Senses on Factors which Influence the uency of Infection showed the d of his development. He used y that though he had always d sums he was no mathematician. that as it may, Karl Pearson his *Grammar of Science* turned enwood into a statistician, and application of statistical methods edical research was to remain the f interest of his life.

[Vernon

During the first world war he served in the R.A.M.C., h the rank of captain, till in 1917 he was put in charge the medical research subsection of the Ministry of mitions. In 1918, with Udney Yule, he wrote the dical Research Committee report on causes of wastage munition factories, and his investigations with E. L. llis and May Smith into fatigue and other industrial blems were continued through his work for the dustrial Health Research Board. *Health of the dustrial Worker*, which he wrote jointly with Collis, peared in 1921, and in 1935 in his Heath Clark lectures discussed the temperamental factor in industry.

In 1919 he was put in charge of the division of medical atistics of the new Ministry of Health, a post he held til 1928 when he was appointed to the chair at the ndon School of Hygiene, where he remained till his tirement in 1945. Here he brought statistics to the aid bacteriology, and with the late W. W. C. Topley and devoted team of investigators, through the study of perimental mouse epidemics, he attempted to create "grammar of the language of epidemiology." This ork he described in his Herter lecture in 1931, in *pidemics and Crowd Diseases* (1935), in *Experimental pidemiology* (a report made to the Medical Research ouncil in 1936), and in a *Statistical Study of Infectious Diseases* (1946). Alike by investigation, by teaching, y advice, and by criticism, he exercised over con- mporary medicine a strong and astringent influence which is far from being exhausted.

In his presidential address to the epidemiology section of the Royal Society of Medicine he described the early years of the General Register Office, and his veneration for the early workers in his own field, especially Farr, led him to study other medical worthies. The *Medical Dictator* (1936) also contains essays on Galen, Freind, "Heart" Latham, Pierre Louis, and Osler. His style was lucid and pungent and if he sometimes found human nature to be frail his estimate escaped him in the guise of quotation and quip. Last year he published some *British Pioneers of Social Medicine*—another set of Heath Clark lectures—celebrating the centenary of Simon's appointment as medical officer of health for London.

His work during the 1914–18 war on the Liquor Control Board was less well known than his other activities. As one of the original members of the Academic Assistance Council (which later became the Society for the Protection of Learning) he also had continuous experience of the plight of displaced scientists, and during the late war he wrote wisely and generously on behalf of the medical refugees who sought work here in their own profession.

The list of his academic honours is formidable. In 1922 he delivered the Milroy lectures to the Royal College of Physicians and in 1924 he was elected F.R.C.P. In 1927 he was awarded the Buchanan medal of the Royal Society and the following year he was admitted to their fellowship. From 1934 to 1936 he presided over the Royal Statistical Society, which he had served for the previous 15 years as secretary. In 1945 he received their Guy medal in gold. He was also an honorary member of the American Statistical Association and the Indian National Academy of Science and a member of the International Statistical Institute. From its inception he was chairman of the statistical committee of the Medical Research Council.

Greenwood will always be gratefully remembered by early research-workers who often found themselves struggling with problems little understood even by members of the committee theoretically responsible. And if he won recognition for his specialty he held a balanced view of its scope. As early as 1924 he wrote:

> "When I first took an interest in these matters, more than twenty years ago, there was some tendency to treat the statistician or biometrician as a pariah, and he acquired the virtues and vices of a minority, a certain courage and a certain trick of overemphasis. Now statistics and statisticians are perfectly respectable; there may even be a risk of putting the claims of the statistical expert too high . . . the statistician must be the equal not the predominant partner."

Nor did he expect to accomplish overmuch among the unstatistical. For instance in 1930, when opening a discussion on vaccination, he admitted that he did not hope "to alter the settled convictions of any one of his audience by statistical reasoning." But in his last paper in our columns, on Simple Statistics of Cancer, he suggested that "even a busy surgeon allergic to algebra" need not find the principles of random sampling too difficult to master.

M. S. adds: "Professor Greenwood enjoyed a verbal fight and was never deterred by the possible unpopularity of his point of view. His defence of the psycho-analysts at a time when within and without the medical profession they were somewhat unscrupulously attacked was a masterpiece of pungent writing. As a teacher he spared no pains in the preparation of his lectures. Matter, form, and delivery were an inspiration to the brighter students, and even those who failed to grasp his point of view recognised him as a great personality. He had an amazing memory and could quote almost verbatim from any book he had read. He loved the classical writers particularly Virgil, but he was familiar with medieval and modern writers and within a few minutes he might casually quote from an obscure Latin work, from Thomas Aquinas, Marx, or some detective story read years before.

The earlier statisticians were never mere mathematicians to him but always human beings.

"As a critic he was just, but at times he failed to realise that a great gulf often separated his knowledge and ability from those of lesser people. As the head of a department he was kindness itself; for any one in trouble he would do all he could and he usually did it unobtrusively but efficiently. Among those who knew him best he inspired affection, but those who rarely came in contact with him were more than a little in awe of him. He suffered from occasional fits of depression and it was during these periods that he was difficult to understand. Once he said of himself that he spent much time in encouraging self-distrustful people who envied him his confidence and readiness, whereas he toiled very hard to do the things that looked easy. His own alternating moods gave him a deep insight into some of the writers he studied—perhaps in particular Galen. He died as he would have wished, at work."

Dr. Greenwood married in 1908 Rosa Baur, who died in 1945. They leave two sons.

Diary of the Week

OCT. 16 TO 22

Monday, 17th

UNIVERSITY OF LONDON
5.15 P.M. (*University College, W.C.1.*) Prof. J. Z. Young, F.R.S.: Structure of Peripheral Nerve. (Last of two lectures.)
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, Gray's Inn Road, W.C.1
2.30 P.M. Mr. F. C. W. Capps: Tumours of the Post-nasal space.
HUNTERIAN SOCIETY
8.30 P.M. (Talbot Restaurant, London Wall, E.C.2.) Dr. William Thomson Brown: Balance. (Presidential address.)

Tuesday, 18th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
3 P.M. Dr. Geoffrey Marshall: Individuality in Medicine.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. R. M. B. MacKenna: Allergy.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY
2.30 P.M. Mr. W. A. Mill: Malignant Diseases and Radiotherapy.
SOCIETY FOR THE STUDY OF ADDICTION
4 P.M. (11, Chandos Street, W.1.) Prof. F. L. Golla: Problems for Research in the Study of Addiction. (Presidential address.)

Wednesday, 19th

UNIVERSITY OF LONDON
5.30 P.M. (University College.) Sir Paul Fildes, F.R.S.: Growth and Reproduction of Bacteria. (First of three lectures.)
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. C. W. McKenny: X-ray Technique.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. W. Wallace King-Brown: Present Position of Diphtheria Immunisation.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. R. Leishman: Tobacco Amblyopia.
NORTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY
2.30 P.M. (Ware Park Sanatorium, Herts.) Mr. O. S. Tubbs: Resection of the Lung for Pulmonary Tuberculosis.

Thursday, 20th

INSTITUTE OF UROLOGY
5 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) Prof. Victor Dix: Conservative Treatment of Hydronephrosis.
ST. GEORGE'S HOSPITA
4.30 P.M. Dr. Denis
ROYAL SOCIETY OF TRC
Place, W.1.
7.30 P.M. Prof. H. E. Shortt: Tropical Medicine as a Career.
SOCIETY OF MEDICAL OFFICERS OF HEALTH, Tavistock House, W.C.1
5.30 P.M. Dr. H. C. Maurice Williams: Bridging the Gap.

Friday, 21st

UNIVERSI
5.15 P.M . Bernhard Katz: Transmission
Muscle. (First of six lectures.)
FACULTY
2.15 P. al College of Surgeons). Dr.
Value of Tannic Acid Varium Enema in Colonic Investigation. Dr. C. N. Pulvertaft: Causes of Failure after Gastrectomy for Peptic Ulcer. Dr. G. Simon: X-ray Appearances of Acquired Collapse (*Atelectasis*) of the Upper Lobes.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY
8.30 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Mr. V. B. Green-Armytage: The Dramatic in Gynæcology and Obstetrics. (Presidential address.)
MIDDLESEX COUNTY MEDICAL SOCIETY
3 P.M. (Hillingdon Hospital, Uxbridge.) Dr. H. V. Morton: Respiratory Patterns *During Surgery and Anæsthesia.* Dr. A. R. Harris of Jaundice.
MAIDA VALE HOSPITAL FO MEDICAL SCHOOL
5 P.M. Dr. A. Feiling:

Saturday, 22nd

BIOCHEMICAL SOCIETY
2 P.M. (King's College, Strand, W.C.2.) Short papers.

Notes and News

MEMORIALS OF THE HUNTERIAN SOCIETY

STARTING from a caricature of Sir William Blizard
president, in which he looks appropriately chilled to the
the Hunterian Society has collected many pleasant
of its history, and showed them at a party on Oct. 6.
ments included a copy of Hunter's will, and the
of the society. Hunter's own snuff-box was there, of
and so, to confuse the issue, was the snuff-box of Dr.
Hunter, of the Minories, who knew but was not the
The *massive gold watch (no mere half-hunter)*
their famous surgeon by St. George's Hospital was
still; and a silhouette, from among Hunter's own posse
showed the profile of his friend and pupil, Jenner. His
fine blunt face is known to all London from the bust
St. George's Gate, conveniently viewed from the top of
In this exhibition it appeared in the engraving at the begin
of his *Treatise on the Blood, Inflammation and Gunshot Wo*
and in the death-mask where, the softening tufts of ha
the temples being lost, and the deep grooves between
and lip, the long lids, and the jut of the nose can be
appreciated. The *Treatise* was his last book: his first
Natural History of Human Teeth—was also on view. A port
of his assistant, William Clift, shows a face which
acquired, in the course of long years of devoted collabora
with him, something of Hunter's own look.

MALARIA IN BRIEF

THE Ministry of Transport's *Suggestions for the Preven*
Diagnosis, and Treatment of Malaria,[1] intended for s
surgeons, supersedes a Ministry of Shipping memoran
issued in February 1941. The chief differences bet
the two are due to the introduction of 'Paludrine';
there are other useful changes. Thus "prophylaxis"
become "suppressive treatment," and in the part on cli
manifestations a section on atypical attacks has been ins
between those on typical and pernicious attacks; and
are added sections on relapses, malaria in children,
malaria in pregnancy—all very useful.

It must always be difficult to draw up such a brief acc
of the most protean of all diseases, and on the clinical
it is doubtful whether this can be bettered. Two impo
principles are printed in italics. The first is: "It (ma
may simulate or be simulated by any other disease kno
medical science." Those who have had no experience of m
in the wilds, afloat or ashore, away from any recognised ma
service, find it hard to appreciate this but it is broadly
The second is: "Malaria may complicate or be complicat
any disease (medical or surgical) known to medical scie
This may be obvious but is often forgotten. Under "G
Precautions" a list of administrative arrangements is
which if carried out to the last letter would prevent a
on board ship ever catching malaria. The first two, how
on which the rest hang, are not suggestions to ships' surg
They could only be carried out by arrangement at the h
level between Ministry, owners, and merchants at eithe
of the voyage.

This excellent pamphlet should not be kept only f
ship's surgeon. It should be issued, free of charge, to the
of every medical school for him to pass on to the teach
tropical medicine, for it will give the student as much pra
information in shorter space than any textbook, gene
special. The dean should also have copies to hand to the
qualified man going to any place where malaria m
encountered. The various "tips" included in these
do not all find their way into a textbook but are pr
what the newcomer to the tropics wants when treati
first cases.

A NEW SCANDINAVIAN JOURNAL

STILL one more medical periodical has made its appe
—the *Scandinavian Journal of Clinical and Labo*
be-published quarterly by the Med
Forlag, of Oslo, for the Scandin
Chemistry and *Clinical* Physi
The editors, in their preface, see the need for a Scandin
journal "devoted to experimental clinical research comm
all specialties"—work which "must be based on labor

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1. Ministry of Transport Notice no. M. 333.

ations." Despite alarm at the growing number of , most will agree with the editors that this particular is required to complete the range of subjects covered Scandinavian literature; and we welcome the appear- what promises to be another well-edited and pleasing al from this quarter of Europe. The first number s nine articles in English, mostly on biochemical and a technical section which is to be devoted to ory organisation and construction and the training ratory personnel. The articles in the first issue include ble one on the Complete Porphyrin Analysis of Patho- Urines by S. L. Sveinsson, C. Rimington, and H. D. . The foreign subscription rate is Kr. 35 per annum.

PAVLOV FILM

centenary of Pavlov's birth is being celebrated this nd through the good work of the Society for Cultural ons with the U.S.S.R. and of the British Film Institute, n *The Mechanism of the Brain* has been copied on to . gauge to make it widely available. Made in 1925, a silent film in six reels, lasting nearly 1½ hours, and is able from National Film Library, 4, Great Russell , W.C.1. After noting that more complex behaviour ds on a more complex brain (reel 1), the transmission of ses by nervous tissue is shown (reel 2), then various les of absolute reflexes and conditioned reflexes (reel 3). ion of cerebral cortex suppresses function on the opposite f the body (reel 4). Reel 5 shows the production and tion of conditioned reflexes in children, the differentiation ilar stimuli, and the effects of agenesis and disease of rain. In reel 6 are shown reflexes of the child at birth as he grows older. The end of the film refers to the t" reflex, which urges man to achievement. The film, ich further particulars may be had from the Scientific Association, is still of great interest and is likely to e useful to teachers of physiology.

"FOR THOSE ABOUT TO MARRY"

a small leaflet with this title the Family Planning ation have set out simply and acceptably some facts t sex relations which young married couples should know. es (6*d.* each, postage 2½*d.*) are obtainable from the ation, 69, Eccleston Square, London, S.W.1.

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versity of London

r. Erwin Stengel has been appointed to the university dership in psychiatry at the Institute of Psychiatry.

r. Stengel took his M.D. in 1926 at the University of Vienna re he later held a readership in psychiatry and neurology. In he obtained the Scottish Conjoint qualification. Since leaving na he has held a research fellowship in psychiatry at the ersity of Edinburgh and the directorship of clinical research at nwell Hospital, Chichester. At present he is physician to Bethlem Royal and Maudsley Hospitals. He has published ers on the Ætiology of Fugue States, Air-raid Phobia, and ssional Neurosis and Psychotic Reaction Types.

yal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty on Oct. 3, with Dr. W. R. oigrass, the president, in the chair, Mr. L. S. Scott was mitted to the fellowship qua surgeon.

ciety of Apothecaries of London

Ten postgraduate lectures on modern therapeutics will given in the hall of the society, Black Friars Lane, E.C.4, ing December. Further particulars will be found in our vertisement columns.

ociety of Anæsthetists of South Wales

At a meeting of this society to be held at the Park Hotel, ardiff, at 7 P.M. on Nov. 4, Dr. John Gillies will give an dress.

ondon County Medical Society

A clinical meeting of this society will be held at the Mary ington wing of the Whittington Hospital, Highgate Hill, N.19, on Nov. 2, at 3 P.M.

West London Medico-Chirurgical Society

Mr. V. B. Green-Armytage will deliver his presidential ddress to this society on Friday, Oct. 21, at 8.30 P.M., at the South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7. He has chosen as his subject the Dramatic in Gynæcology and Obstetrics.

Royal Dental Hospital, London

The annual clinical At Home will be held at the hospital on Saturday, Oct. 29, at 3 P.M. The departments will be open for inspection from 9.30 A.M. onwards, and at 12.30 P.M. Dr. Lilian Lindsay will open the Stoke memorial library.

Royal Appointments

Dr. J. N. Loring has been appointed apothecary to the King and to Queen Mary, Princess Elizabeth, and the Duke of Edinburgh. Sir Frederick Hewett has been appointed extra surgeon apothecary to the King and to Queen Mary. Sir James Walton has been appointed an extra surgeon to Queen Mary, and Dr. G. C. Birt, L.D.S., an extra surgeon dentist.

Physiotherapists Association

On Monday, Oct. 17, Dr. Louis Moss will give a lecture on a New Treatment for Chronic Rheumatism by the Use of Adrenaline Cream, and on Wednesday, Nov. 23, Dr. Philip Ellman will speak on the Place of Physical Medicine in General Practice. Both lectures will be given at Charing Cross Hotel, Strand, London, W.C.2, at 8 P.M.

Scottish Committee on the Welfare of the Disabled

This committee of the Scottish Council of Social Service is holding a conference, on the Disabilities of Organic Nervous Disease, in the Lesser City Hall, Perth, on Friday and Saturday, Nov. 4 and 5. Speakers will include Dr. G. W. Ireland, Dr. J. B. Gaylor, Dr. J. Romanes Davidson, and Mr. Joseph Schorstein, F.R.C.S.

Agricultural Research Council

Mr. K. Mather, F.R.S., professor of genetics in the University of Birmingham, Dr. S. Zuckerman, F.R.S., professor of anatomy in the University of Birmingham, and Mr. G. F. Marrian, F.R.S., professor of chemistry in relation to medicine in the University of Edinburgh, have been appointed members of the council in succession to Prof. T. G. B. Osborn, Sir John Simonsen, and Mr. W. J. Wright, whose terms of office have expired.

W.H.O. in South-East Asia

The W.H.O. Regional Committee for South-East Asia has made a series of decisions which are expected to lead to greater coöperation among countries in this area. Delegates from India, Afghanistan, Burma, Ceylon, Thailand, and French and Portuguese India have agreed on plans to pool national resources for training health workers; to manufacture essential medical supplies, such as D.D.T. and penicillin, within the region; to approach the United Nations Economic Commission for Asia and the Far East for assistance in obtaining materials for housing projects; and to exchange information on public-health work. The committee also approved a recommendation that top priority should be given to extending the B.C.G. vaccination programme and to creating a national tuberculosis training centre in a country of the region.

Executive Councils' Association

At the fifth meeting of the management committee of this association on Sept. 9 the subjects discussed included the following:

Branch surgeries in rural areas.—In reply to a suggestion that executive councils should be authorised to provide these surgeries, recovering the cost from the practitioner over an extended period, the Minister of Health had replied that he considered the provision of adequate surgery accommodation to be the responsibility of the practitioner providing general medical services and not of the executive council. A fund similar to the special subsidy portion of the insurance mileage fund was not available. He suggested, however, that the doctor might apply for an inducement payment to help meet exceptional cost. It was not intended that capital expenditure should be provided in this way, but a regular annual payment might be made in consideration of the extra expense involved in providing and maintaining a village surgery.

[illegible] *practitioners on medical advisory com- [illegible]nent committees.*—A resolution was sub- [illegible]ing that as specialist representation was provided on these advisory committees there should also be direct representation of general practitioners and that all proposals for the organisation of hospital services should be submitted to the local medical committee for observation. "Suspicion, misunderstanding and ill-will" were in danger of being engendered by the existing situation.

Supplementary ophthalmic services.—It was stated that the Minister was considering the suggestion that, in view of the heavy demands on these services, opticians might be allowed to repair or replace glasses without requiring the applicant to undergo a further sight test.

The second annual meeting of the association will be held at Bournemouth on Oct. 20 and 21.

McGill University, Montreal

Dr. A. S. V. Burgen, demonstrator in pharmacology at Middlesex Hospital medical school, has been appointed to the chair of physiology in the university.

Physiology of Vision

Prof. Hamilton Hartridge, F.R.S., in his series of lectures on this subject, will give the fourth part, dealing with the retina, on Oct. 24, 25, 26, and 27. The lectures, which are free, will be held at Gresham College, E.C.2, at 5.30 P.M.

University of London World Government Movement

Prof. R. J. V. Pulvertaft will take the chair at the meeting of this body which is to be held at 6.30 P.M. on Monday, Oct. 17, at the Union Assembly Hall. Further information and tickets may be had from J. H. Clark, King's College Hall, Champion Hill, S.E.5.

Social Psychotherapy Centre

Last week the first of ten lectures entitled Introduction to Social Psychiatry was given at the centre, 7, Fellows Road, London, N.W.3. They will be held weekly on Wednesdays at 5 P.M., till Dec. 14. The speakers include Dr. Joshua Bierer, Dr. E. N. Snowden, Dr. A. R. Redfern, and Dr. A. Joyce Martin.

Hormone Assay

Prof. J. H. Gaddum, F.R.S., will take the chair at a symposium on this subject to be held by the biological methods group of the Society of Public Analysts and other Analytical Chemists and the Society for Endocrinology at 11, Chandos Street, London, W.1, on Thursday, Oct. 20, at 2.15 P.M. The speakers will include, Dr. H. O. Schild, Dr. G. F. Somers, Mr. K. L. Smith, Dr. J. A. Loraine, Mr. G. A. Stewart, and Dr. P. M. F. Bishop.

Free Medicine Scheme in Australia

The Melbourne correspondent of the *Times* (Oct. 8) reports that the High Court, by a majority of 4 to 2, has declared invalid section 7A of the Pharmaceutical Benefits Act, requiring doctors to use a prescription form supplied by the Commonwealth government when prescribing free medicine. The ground for the judgment was that it was a form of civil conscription, which is forbidden by the constitution. Senator McKenna, the minister for health and social services, has announced that doctors willing to prescribe on the official form will continue to do so. He is to ask the Cabinet to consider alternative courses to ensure the supply of free medicine.

Increased Cost of New Zealand Medical Benefits

Anxiety over the growing cost of medical benefits under the social-security scheme has been expressed by the New Zealand ministry of health in its annual report to Parliament. The cost of the services, including upkeep of hospitals, doctors' and dentists' fees, and medicines, is reported by B.U.P. to have risen from £2,435,000 in 1941–42 to £7,843,000 in 1948–49. Between 1942–43 and 1948–49 the cost of doctors' fees has risen from £1,016,000 to £2,306,000, and the cost of free medicines from £563,000 to £1,793,000. The ministry admits that some expenditure is wasteful and unnecessary; and the report announces that a disciplinary committee of practising doctors is to be set up to stop doctors abusing the scheme.

The President's Plan for Medicine

Mr. Oscar Ewing, federal security administrator, has suggested that in the long run President Truman's national health insurance programme would actually prevent the socialisation of medicine. Mr. Ewing, who was speaking in New York, is reported by B.U.P. to have said that almost half the population could not fit ordinary medical care into the family budget. The President's plan was opposed by medical groups, who proposed voluntary health insurance as the alternative, with the government taking steps to look after those who could not pay. This alternative would mean, however, that more and more people would be classed as "medically indigent"—eventually including those with incomes of $50 a week or more—because they could not afford the high fixed premiums of voluntary insurance schemes. "The result, I am convinced, would be to put the government so deep in the business of providing free medical care that we should never get out of it. Once the pattern was set, we should indeed be on the road to socialised medicine with a vengeance."

Medical Practices Committee

The London Local Medical Committee on Sept. 28 to inform the London Executive Council that it is opinion that the whole of London should be regarded open area.

Mr. A. J. Wright will deliver the Semon 1, Wimpole Street, W.1, on Thursday, Nov. 3, at 5 is to speak on Tonsillar Function.

Dr. Brock Chisholm, director-general of the World Organisation, has been paying a visit to Brazil. From he went on to Peru, and he is returning to Lake Success.

Copies of the catalogue of the Jenner bicentenary (*Lancet*, Oct. 1, p. 616) are obtainable from the University Press, who are publishing it on behalf Wellcome Historical Medical Museum.

The proceedings of the Family Planning Asso conference on infertility held in Exeter in Septemb year (*Lancet*, 1948, ii, 542) have been published. price 10s. 6*d*. each, are obtainable from the association Eccleston Square, London, S.W.1.

CORRIGENDUM: *Clues to the Ætiology of Graves's Di* In this lecture by Professor Means, printed in our is Sept. 24, the last sentence of the third paragraph und heading "adrenal cortex" (p. 547) should read: "If the administration of either adrenaline or adrenocortico hormone there is no fall in the eosinophil-count, the conc is that the cortex is incapable of being stimulated."

Appointments

BARRAN, G. F., B.A., M.D. Camb.: consultant chest physi King's Lynn and West Norfolk area.

JACKSON, M. I., M.R.C.S.: consultant chest physician, Newport East Monmouthshire area.

McILROY, W. E., M.B. Belf., D.P.M.: psychiatrist, Barming Hospital, Kent.

NELSON, I. D. M., M.B. Belf., D.P.H.: deputy M.O.H., Dewsbury.

RAFTERY, LILIAN, M.R.C.S., M.M.S.A., M.R.C.O.G.: asst. vi gynæcologist and obstetrician, King Edward VIII Ho Durban, Natal.

STEWART, R. H. M., M.D. Lpool: senior M.O., Manchester Regi Hospital Board.

WILLIAMS, A. H., M.D. Lpool, D.P.M.: psychiatrist, Barming He Hospital, Kent.

Colonial Service:

HARGREAVES, ANTHONY, M.A., M.B. Camb.: dermatolo Kenya.

NUNN, J. F., M.B. Birm.: M.O., Malaya.

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On Oct. 6, in London, the wife of Dr. T. B. Ande —a daughter.

BURNE.—On Oct. 6, at Sheffield, the wife of Dr. J. C. Burn daughter.

FAIRLIE-CLARKE.—On Oct. 3, at Greenham Common, Newb the wife of Mr. G. A. Fairlie-Clarke, F.R.C.S.—a daughter.

FURNIVAL.—The wife of Dr. J.T. Furnival—a son.

GOULD.—On Oct. 1, at Buxton, the wife of Dr. L. N. Gould—a

GRIFFITHS.—On Sept. 30, the wife of Dr. F. E. D. Griffiths—a

MACDONALD.—On Oct. 7, at Chesterfield, the wife of Dr. J

1 London, the wife of Dr. A. G. Pea

SHAPIRO.—On Oct. 2, at Didsbury, the wife of Dr. H. J. Shap a daughter.

MARRIAGES

BURNS-PRICE—THORP.—On Oct. Harry B

1, at Worthing, John Es ry York Moore.

, John Francis Nunn, M.

1, at Newport, Isle of W tty Bristow.

at Fetcham, Surrey, David Elspeth Mary Frith, M.B.

DEATHS.

FORD.—On Oct. 3, at Eastbourne, Frank Chubb Ford, M.B. D aged 82.

GREENWOOD.—On Oct. 5, in London, Major Greenwood, Lond., F.R.C.P., F.R.S., aged 69.

LANYON.—On Oct. 4, at Penzance, Edgar Temple Lanyon, M

RABAN.—On Oct. 2, John Prideaux Raban, T.D., M.R.C.S., D.M.

THE CARDIOLOGY OF OLD AGE*

C. J. GAVEY

M.D. Lond., F.R.C.P.

NT PHYSICIAN AND PHYSICIAN-IN-CHARGE OF CARDIO-
C DEPARTMENT, WESTMINSTER HOSPITAL; ASSISTANT
IAN, MOORFIELDS, WESTMINSTER, AND CENTRAL EYE
AL: LATE PATERSON SCHOLAR, CARDIAC DEPARTMENT,
LONDON HOSPITAL

With illustrations on plate

nervous and cardiovascular systems are together urce of most of the troubles of old age. The old has a heart which deserves special attention, for survived the hazards so dangerous in the preceding ecades. Even so, most of the aged die from heart ons. I know of only one book in English which deals with the cardiology of old age—namely, Balfour's *Senile Heart* (1896)—but modern cardiological ms in the aged have been reviewed by Freedberg ewis (1944). Allbutt (1915) and Mackenzie (1923) written much of interest, and Sheldon (1948), in ey of more than 400 old people, has given details incidence of cardiac and other symptoms.

nitions.—It is first necessary to define some "Senility" is pathological old age, and "senes-" should be applied to the process of growing old. ontology" is the science of old age, and "geriatrics" treatment of diseases of old age. "Old age" is ficult to define as childhood, maturity, and middle The State has decided that it begins at 60 in women 5 in men, but we do not accept that as physiologists. ieve that 70 is correct for both sexes, if we take the gical limit of human life to be 100 years. True that many are older than their years. In fact, as ames Paget (1902) said, "we do not measure a man's by the earth's revolutions around the sun but by revolutions of his morbid processes." "There are s in the chronometry of life," he observed, "and small beginnings in early life they become con-tly more serious." Old age is a natural process should not have the stigma of morbidity attached to Yet certain pathological processes are so common they have been regarded by some as inseparable old age—e.g., arteriosclerosis.

NORMAL AGEING

arthin (1928) reminds us that ageing is an involu-ary process which is inherent in the organism, and s irrevocable and incapable of retardation to its mate end in biological death. Whatever power we have in inhibiting the ravages of disease we cannot, shall we be able to in future, prolong human life ond its biological limit, which, with few exceptions, s not extend beyond 100 years. This emphasises the tence of a normal old age, and Warthin goes on to the tissue changes during the involutionary period and pares them with those found in the human placenta, ich grows, matures, involutes, and is finally dis-ded as useless. Involution is characterised by atrophy tissues; the cells lose their power of division eneration is less, and supporting tissues atrophy. s process is found in every tissue of the body, of special interest to us are the changes in the rdiovascular system.

When a biological death takes place at an old age, the e energy of the organism is spent, and nothing can olong life. The candle of life, as it were, snuffs out. he heart is the prime mover in life, and a biological ath is a primary cardiac death. It is not easy to ecide in what cases a biological death has taken place and Warthin states that in his thirty-eight years' experience of morbid anatomy he could recall but 25 necropsies in which biological death could be presumed. His protracted study of the problem, however, is worth noting, for he regards arteriosclerosis as an essential feature of ageing, accepting that the degree of this varies much, and that very old people may have no arteriosclerosis demonstrable clinically. Korenchevsky (1949) concludes that the primary cause of physiological senescence in old age is still unknown.

A study of centenarians was carried out by Humphry (1889), and from them it was thought that the normal ageing processes could be deduced. The hearts examined showed atrophy in some and hypertrophy in others but rarely gross hypertrophy. Fatty accumulation about the heart was a constant finding. The great muscular arteries were often cartilaginous or ossified, but in one patient, aged 107, there was minimal atheroma in the aorta. Harvey (1635) examined the heart of old Parr, aged 152, and reported as follows:

> "The heart was large and thick and fibrous, and contained a considerable quantity of adhering fat, both in the circumference and over its septum. The blood in the heart, of a black colour, was dilute and scarcely coagulated; in the right ventricle alone some small clots were discovered."

Harvey, according to Thoms (1873), did not vouch for the age of old Parr but simply recorded what he found, and there are few centenarians whose age could be guaranteed after adequate search for errors in recording the age.

It is of some interest to note that investigations of previous generations show that the biological life span has not increased. More live to an old age than formerly but since man gave us records the age of the oldest people has been the same whatever the race or generation (Thoms 1873). There is thus some hope that the world will not become as overpopulated as some fear.

THE NORMAL HEART IN OLD AGE

Everyone is familiar with the appearance of the normal aged person and with the infinite variations described in published reports. The pulse-rate scarcely varies in the different age-groups. There is a reduction of exercise tolerance, but dyspnœa is not a feature of healthy old age if the physiological amount of exertion appropriate to the age is taken. The configuration of the chest tends to kyphosis from atrophy of vertebral discs, but here again it is not an invariable accompaniment of old age. A reduction in vital capacity is likewise not essential, but it has been shown that a substantial reduction usually occurs, due to kyphosis, to a high diaphragm, and to reduced elasticity of the lungs.

The heart may appear as normal at the age of 90 or even 100 as at that of 50. The apex-beat is usually more difficult to localise because of emphysema but it can be distinct. The heart sounds should be clear and unaccompanied by murmurs, though systolic murmurs are frequent and need have but little significance. Anatomically the aged heart is like the younger except for an excess of fat in the normal grooves and for opacity of the pericardium (fig. 1). Brown atrophy is often seen with reduction in striation. The heart weight is not materially altered but in relation to the total body-weight, which is usually lowered, it may be relatively heavy. Boyd (1861, cited by Humphry 1889) contrasted the heart weights of men and women aged 30–40 with those aged 80 or more, but they differed little, allowing for total body-weight, whereas the spleens and kidneys of the aged were half the weight of those of the young.

The heart chambers are not remarkable in the healthy old patient. The valves are sometimes sclerosed or even calcified. A slight degree of this can be regarded

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The Goulstonian lectures of the Royal College of Physicians delivered on Jan. 11 and 13, 1949.

as normal; but, if the valves become incompetent or stenosed, we must certainly accept a pathological degree of change to have taken place. Yet so many works on "normals" include such cases. Though gross changes in the valves may be found in symptomless old age they are nevertheless to be regarded as pathological. The degree of change that can be allowed as normal is determined by the least amount found in the oldest of patients.

The aorta dilates, lengthens, unfolds, and becomes less elastic with age—so much so that on cardioscopy one has come to be able to tell the patient's biological age from the appearances of the aorta. The actual age in years is impossible thus to foretell. Patients may live despite gross changes, but that detracts not an iota from the fact that the changes are pathological. The great muscular arteries share the same fate. They become dilated, thickened, and tortuous, but only a slight degree is permissible in normal old age. The small muscular arteries, including the coronary vessels, show mostly intimal thickening, whereby the lumen is narrowed. This causes a reduction of blood-supply to the various organs, but since these are undergoing involution they need less oxygen, and a physiological state for old age persists. But, if atheromatous degeneration supervenes, we are dealing with a pathological process, however common it may be without the deleterious effects of ischæmia.

It is for the clinician, and later the morbid anatomist, to decide how far the pathological changes secondary to involution have altered function. Function does not run parallel with the pathology, as we all know, and there lies the need for clinical judgment based on all available evidence. "A man is as old as his arteries," says Cazali. Yes, but one of these may be diseased out of all proportion to the others, and we are all familiar with the small plaque of atheroma in a coronary vessel that has caused death, when all other vessels show but a trace of abnormality. Nevertheless it is our practice, and rightly so, to make use of group medicine in the management of the individual, realising as we do the narrow limits within which we can apply the general to the particular.

MATERIAL

I have specially studied 360 patients over the age of 70 (mostly during five non-consecutive years broken by Army service) at the Westminster Hospital, at the Moorfields, Westminster, and Central Eye Hospital, and in private practice. But I have naturally drawn much on the experience of earlier cases, of which I have records, at the London Hospital, both in the general wards and in the cardiac department.

The eye patients, 100 of them, were seen mostly as outpatients for assessment of their general condition, but apart from these the cases here analysed are representative of what a physician interested in cardiology may meet from day to day in medical and surgical wards and in practice. In this feature lies the interest of my personal series, for larger groups are to be found in special departments. The proportion of old patients among my records of all cases varied at different times from 2 to 10%.

TABLE I—AGE AND SEX OF PATIENTS

No. of cases	Whole group		Eye patients	
	Average age (years)	No. of patients over 80	Average age (years)	No. of patients over 80
Males 179 ..	74	15	74	5
Females 181 ..	73·5	19	72 8	7
Totals: 360	73·8	34 (*9·4%*)	73·3	12 (*12%*)

The age of my patients averaged 73·8, and it similar in males and females, both in the eye and in the total group. There were 34 patients over 80 (table I).

ÆTIOLOGICAL TYPES OF CARDIOVASCULAR DI IN THE AGED

Congenital.—Only 1 patient in my series had a genital anomaly—bicuspid aortic valve with imposed atheroma. Abbott (1936), in her analys 1000 necropsies on patients with congenital ca disease, records the following abnormalities in pat aged 70 or more:

	Age
Pericardial defects	78
Anomalous chordæ in left auricle	84
" " " aorta	76
Patent foramen ovale	70
Defect in interventricular septum	79
Supernumerary cusps of pulmonary valve	90
Coarctation of aorta (adult type)	93
Double aortic arch	87
Anomalies of pulmonary veins	86

Rheumatic.—Very few cases of unquestiona rheumatic valvular disease presenting as such sur to the age of 70, but overlying atherosclerosis is comm particularly in the ætiology of aortic stenosis. rheumatic lesions here predispose to degenera changes with atheroma, which are dealt with bel White and Bland (1941) described a patient, aged with rheumatic mitral stenosis.

Bacterial Endocarditis.—The subacute form is unkno after the age of 70, but the acute form may occur septicæmia. I have met no such case.

Syphilis.—There was no evidence of syphilitic hea disease in any of my patients. Few syphilitics survive the age of 70, but Jones and Bedford (1943) found seve patients aged over 70 with aortic incompetence a angina pectoris. None started angina after the age of but 28 of 103 started it between the ages of 60 and Syphilis should therefore not be discounted because mere old age. On the other hand, care should be ta not to diagnose syphilitic angina just because abnor pupils seem to indicate syphilis, for these pupill changes simulating Argyll Robertson pupils are of due to arteriosclerosis and rigidity of iridal vessels.

Thyrotoxicosis.—It is not rare to find aged patie with frank thyrotoxicosis, and very many more h auricular fibrillation with otherwise masked th toxicosis. Subtotal thyroidectomy was formerly successful in the treatment of these patients, but now have thiouracil for less suitable candidates operation. Auricular fibrillation occasionally per because arteriosclerosis coexists, but thyrotoxic does not favour atheroma, because of diminished bl cholesterol. Of my patients 7 had goitre. The only had exophthalmic ophthalmoplegia and paroxys tachycardia, possibly fibrillation. A woman, aged had auricular fibrillation with a ventricular rate of but she refused treatment and discharged her Another women, aged 75, had slight congestive he failure with normal rhythm but lived eight years lo on digitalis leaf gr. 1 b.d., which controlled the ta cardia to some extent. Another had thyroidectomy at age of 68, and at 74 she was still toxic but with failure and sinus arrhythmia. A woman, aged 78, survi thyroidectomy for an enormous goitre which showe evidence of toxic changes histologically and she was on discharge three weeks later. She was the only pat without hypertension, her blood-pressure being 12 Two others had toxic goitre, hypertension, and nor rhythm.

Myxœdema must be suspected, but it is rare, an have only 1 patient whose myxœdema began after age of 70. She responded at once to thyroid and remai well, with a blood-pressure of 150/95.

ic myocarditis with acute failure was common in lphonamide days in lobar pneumonia and in hopneumonia, and in patients treated late this lication is still seen. It is usually fatal; but, if it venes late in the illness, there is some hope of ery, particularly with the help of mercurial diuretics. not easy to recognise in the feeble aged especially, se peripheral failure so often coexists, and the veins may therefore not distend. Œdema in the l area need not be cardiac but it usually is. One patient recovered with the aid of digitalis, but was old-standing hypertension, which probably ibuted to failure precipitated by the pneumonia. must suspect too that a pulmonary embolus may be ause of bronchopneumonia, and cor pulmonale may t. Toxic myocarditis is in fact rare, and in cases agnosed death results more often from peripheral latory failure and cerebral ischæmia.

ronic cor pulmonale is rare in the aged, and I have ded only 1 case, in a man aged 70, who had had chitis for twenty-five years. The outflow tract of heart was enlarged. The rarity of this condition e aged is interesting, but it would be diagnosed often if hypertension were not so commonly istent.

ronchitis has an important aggravating action when heart is already diseased by hypertension or by nary sclerosis. The bronchitis may be perpetuated gravated by congestion from a failing left ventricle a auricular fibrillation. Bronchitis was a feature in rd of my patients.

enal Heart-disease.—Most, if not all. patients with ht's disease have died before reaching the age of and this fact has not been emphasised enough to date. ve no example of Bright's disease in the aged. The eys often showed ischæmic changes, macroscopically histologically, but only 1 of 8 cases revealed this great degree. A man, aged 70, was in failure with othorax following a coronary thrombosis. His od-urea level was 242 mg. per 100 ml., and he was ught to have chronic nephritis. At necropsy the neys were healthy, each weighing 8 oz. The heart ghed 19 oz. The prostate was healthy. It is important note that the urine had been concentrated, and al heart-disease need not have been suspected. The ed blood-urea level was of extrarenal origin. Albumin- i is not so common as might be expected from arterio- otic renal changes. It was present, though most n as a trace, in 34% of my patients, so many of om were hypertensive. The specific gravity of the he averaged 1·016, and in a third of the patients it s 1·018 or higher. These simple tests remain of great ue in the aged. In hypertensive old men the prostate o be blamed rather than chronic nephritis, if uræmic ptoms appear.

ARTERIOSCLEROSIS

I had thought that in old age it might be possible find some relationship between the blood-pressure d arteriosclerosis in the various clinically accessible eries, in the limbs, retinæ. and heart; for at the age 70 the processes might be considered established. at no such relationship could be found on careful utiny of the figures.

The limb vessels appeared normal in half the cases. oth upper and lower limb vessels were abnormal in quarter, and the lower limb vessels in a third. There as no significant difference between the hypertensive nd non-hypertensive groups. Nor did a high diastolic tion show a preponderance of vessel changes in the mbs. Gross rough thickening of the brachial arteries n non-hypertensives was usually associated with a poor eneral condition. In these old people the condition of the limb vessels bore no relationship to the retinopathy, which was almost always hypertensive, or to coronary disease as evinced by coronary pain.

Intermittent claudication as usually described was found in 4 of 360 cases, and nutritional damage in extremities in 2 others. But, as Mackenzie (1923) pointed out, the classical symptoms are not always present when the same process, defective blood-supply, is at work; pain in the thighs or back or, rarely, in the upper limbs may have the same significance. Moreover, limitation of activity by shortness of breath may protect the patient from intermittent claudication proper.

Kinked carotid was found in 4 women over the age of 70 with blood-pressures varying from 130/90 to 260/170. Parkinson et al. (1939) described the kinked carotid that simulates aneurysm, and their paper shows a radiogram of a woman, aged 79, with the characteristic shadow at the apex of the right lung.

BLOOD-PRESSURE

The idea that the blood-pressure should rise with ageing, and that at the age of 70 it should be 170 mm. Hg, has created two sets of unhappy old people: those who are said to have too low a blood-pressure, and those said to have too high a one. Now, it is common medical experience that two men aged 70 may have a blood-pressure as low as 110/70 and as high as 230/120 with the same expectation of life as a third man with a blood-pressure of 170/90. Among the most robust aged persons are the hypertensives, and the dreaded cerebral hæmorrhage is extremely rare after the age of 70.

There is no normal for old age, but I think it is best to regard the blood-pressure as abnormal, whatever the age, if it exceeds 160/100. This does not mean that treatment need be instituted if a higher figure is obtained. The organs may go on living without producing symptoms, despite pathological phenomena, and this applies specially to the old.

The average blood-pressure in patients first seen at the age of 70 or more was 188/102. Raised tension (over 160/100) was found in 67·4%, normal tension in 29·9%, and "low" tension (115/80) in 2·7%. These figures closely simulate those found by Howell (1944) in Chelsea pensioners. Of the eye patients 88·8% were in the hypertensive group, and none in the lowest tension group. The average for the eye patients was 211/100.

An analysis of patients over the age of 80 (22 cases) showed an average of 193/105, which does not differ much from that of the whole group. The averages for the separate sexes in patients aged over 80 was 200/103 for males and 189/105 for females, a similarity which is important in view of the lesser tolerance of hypertension by middle-aged men. One old man of 80 had a blood-pressure of 270/160.

The eye patients with hypertension were specially interesting in that, apart from defective vision, they were generally in good health. Though the heart was often enlarged, congestive failure was rare. A very few had paroxysmal dyspnœa, but the vast majority had no dyspnœa at all. Dizziness was common but seldom disabling. Angina pectoris was present in a few, and 1 developed coronary thrombosis while under observation. A silent gap was noted on sphygmomanometry in 3 cases, an incidence expected in hypertensives at other ages. Gallop rhythm, canter rhythm, and pulsus alternans were noted occasionally. Systolic murmurs were common at the apex, base, or both. The arterial tree in these eye patients was often remarkably normal, and the predominant abnormal finding was thickened tortuous but resilient vessels. Pulsation in the vessels of the feet was normal in the great majority, and absence of pulsation was more often due to difficulty in palpation through thickened tissues about the ankle and tarsus *than to obliterated arteries. This group contrasts with* non-hypertensive patients, in whom arteriosclerosis is more threatening to the extremities.

As regards the prognosis of hypertension in the aged, a few examples may be mentioned of patients who have survived gross hypertension for several years.

A woman, aged 73, when first seen had a blood-pressure of 270/140 and gallop rhythm; she was still fairly well five years later.

Another woman, whose blood-pressure was 270/190, with thick tortuous arteries in 1938 at the age of 73, recovered from an attack of congestive failure ten years later when, aged 83. Her blood-pressure was then 175/95, and her heart was only a little enlarged as a whole.

Another woman, aged 75 in 1939, had a large pulse pressure, 200/70, and a dilated aorta (non-luetic) but no aortic diastolic murmur, and she was still alive eight years later at the age of 83.

I cannot agree with Thewlis (1946) that a blood-pressure of 110/70 is ideal in old age.

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There are four fundamental groups which at least facilitate discussion, even if in practice it is difficult to place many borderland patients within them.

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With these groups in mind, a full history and clinical, radiological, and electrocardiographic investigation and a long follow-up will enable us to put most of our elderly patients into one of them, but some will still defy classification until necropsy.

CORONARY DISEASE

There were 42 (10·7%) patients with clinical coronary disease, 23 males and 19 females, of equal average age 74; 2 males were aged 80 and a female 84. Two-thirds were hypertensive, mostly females, as in younger age-groups.

Coronary infarction occurred in 20 patients, 12 male and 8 females. It proved fatal in 3 only. Since anastomoses are virtually absent in the old, this high rate of recovery is notable. The incidence of anterior and posterior infarction was equal. The myocardial infarction was without pain in 2 cases, and 1 patient presented with a faint. Cookson (1942) comments on this feature; 5 of his patients aged 70 or more had syncope at the onset. Palmer (1937) found that survival to death or last observation after coronary thrombosis in 4 patients aged 70 or more was 2·93 years.

Abdominal angina was a striking feature in a aged 80, who had survived a coronary thromb years previously. Another man, aged 72, with clinical coronary disease, had several attacks of vi abdominal pain due presumably to slight dissection extended clotting in his arteriosclerotic abdom aneurysm (fig. 2), which could be felt and seen w radiography.

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Mackenzie (1923) recorded many examples of an pectoris in patients over the age of 70. His case 36 a man whose first pain occurred at *the age of 74.* survived through years of frequent pain up to fourt attacks a day, and finally the angina virtually left at the age of 82. Case 40, a man aged 76 when his attack occurred, died eight years later at the age of These are examples of longevity despite angina. Ca (1946) found in his patients that 19% of females a 12·1% of males were over the age of 70.

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Pulmonary embolism occurred in 6 patients, 2 fem and 4 males. Three bedridden patients died from mas pulmonary infarction from emboli detached fr *spontaneous pelvic-vein thrombosis.* Of the non-fa cases, 1 had auricular fibrillation, and the remain 2 were postoperative, after eye operations.

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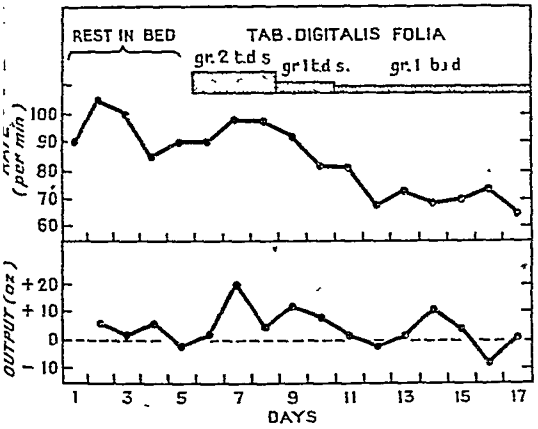
This was found in 6 cases, 2 females and 4 ma All but one had a raised systolic pressure average 1 and the average diastolic pressure was 83. There remain a clear diastolic point in each case. The Wasserma reaction was negative in all cases. Stenosis was prominent in any of these, but in other patients p senting with a systolic murmur at the apex and ao area some stenosis was probably present though n had the classical signs. As previously mentioned, und lying rheumatic disease is a *determining* factor in localisation of atheroma on the aortic valve.

HEART ENLARGEMENT AND AUSCULTATORY SIGNS

Apart from aortic valvular disease (dealt with in foregoing section) the heart was enlarged in 38·1% patients. Most were confirmed radiologically. A fe not included, were thought to have enlargement clinicall but no enlargement was found radiologically, wherea a few of those included had radiological enlargemen not detected clinically. This contrasts with the finding of Fox et al. (1948), who report 52·6% of 300 amb lant males over the age of 60 as having radiologic enlargement of the heart.

Well-defined murmurs at the apex or base, or both were found in 22·6%, and murmurs were found muc less often in the normal-sized hearts (15·4%) than in th large hearts (34·3%)—i.e., half as often. But large heart are therefore often unaccompanied by murmurs, though one adds triple rhythm, which so often takes the place o murmurs, the percentage of abnormal auscultatory sign in enlarged hearts rises to 48·6%. Yet it should b remembered that auscultatory signs are difficult t appreciate in the old, and this percentage still appear *too low.*



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Auricular fibrillation was present in 12 other patients without congestion. If the ventricular rate tended to be rapid, over 80 at rest, digitalis was given in small doses —e.g., gr. 1 of the leaf b.i.d. or daily—in the belief that release of the heart-rate occasioned by ordinary stresses and strains of daily routine would not so easily occur and so failure would be postponed. Quinidine is not precluded by age. Its chief indication is in fibrillation caused by a transient agent, such as anæsthesia, but spontaneous return to normal rhythm is common.

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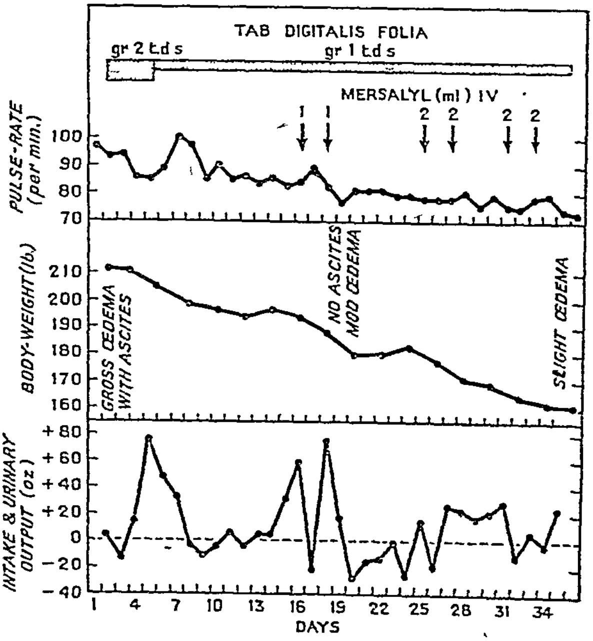

Fig. 4—Effect of digitalis and mercurial diuretics in hypertensive heart-failure with normal rhythm in man aged 77 with blood-pressure 210/145.

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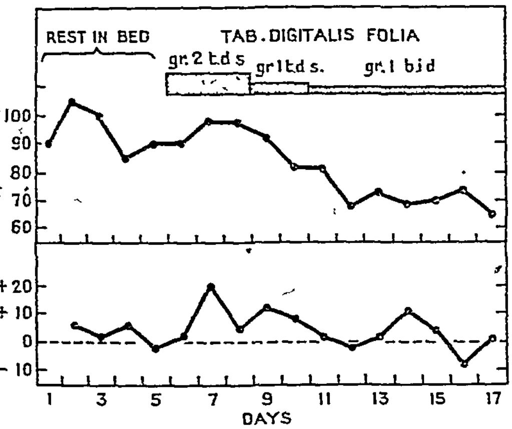

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Auricular fibrillation was present in 12 other patients without congestion. If the ventricular rate tended to be rapid, over 80 at rest, digitalis was given in small doses—e.g., gr. 1 of the leaf b.i.d. or daily—in the belief that release of the heart-rate occasioned by ordinary stresses and strains of daily routine would not so easily occur and so failure would be postponed. Quinidine is not precluded by age. Its chief indication is in fibrillation caused by a transient agent, such as anæsthesia, but spontaneous return to normal rhythm is common.

The mercurial diuretics are as powerful in the aged as in the young, and the partnership with digitalis is indicated (fig. 4). Care is required in old men with

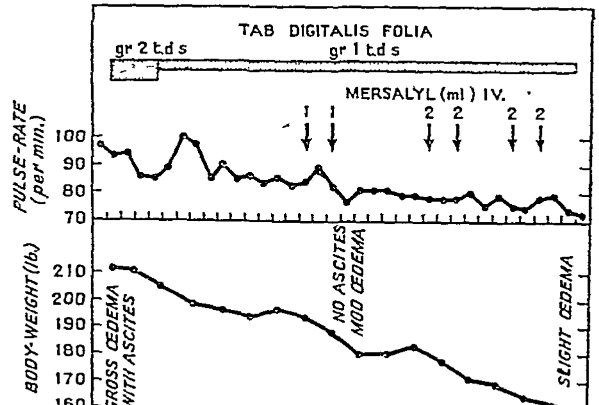


Fig. 4—Effect of digitalis and mercurial diuretics in hypertensive heart-failure with normal rhythm in man aged 77 with blood-pressure 210/145.

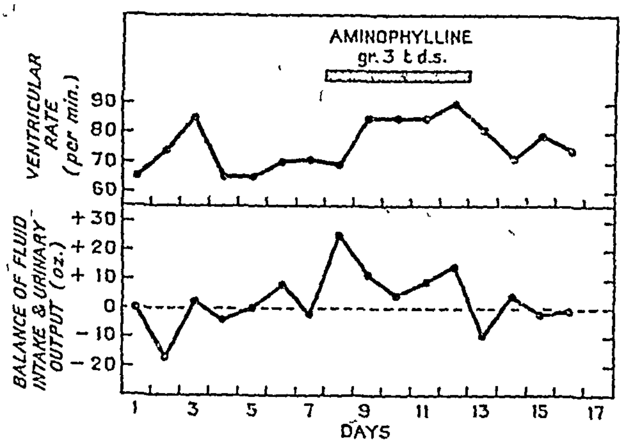


Fig. 5—Effect of aminophylline in hypertensive heart-failure with auricular fibrillation in woman aged 70 with blood-pressure 190/100.

enlarged prostates, for retention of urine may be precipitated by overdistension of the bladder.

Aminophylline by mouth has a place in treatment and may give a rest from injections of mercurials in slight cases (fig. 5) but it is not suitable for continued use, owing to gastro-intestinal disturbances. Aminophylline intravenously is specially indicated in the treatment of Cheyne-Stokes breathing, which is so common in the old, with failure, for abolition of the rhythm may greatly relieve the heart.

Sometimes failure becomes "irreducible." The patient remains in a state of chronic failure with œdema, despite digitalis and mercurials. The picture of the old man confined day and night to his grandfather's chair is familiar though much less common than formerly. In these patients Southey's tubes or multiple incisions may give great relief, and a waterproof plastic pillowcase is a convenient receiver for œdema fluid.

The general treatment of heart-failure with diet, restriction of fluids and of salt, is the same as in younger people, but rest can be overdone, and careful ambulation after at most six weeks may relieve œdema by reducing stasis. Hypnotics of choice are chloral gr. 20 and bromides gr. 20 together, morphine, or Dover's powder. Barbiturates are not well borne and tend to cause mental confusion if used often, but isolated doses of phenobarbitone or 'Sodium Amytal' may be useful. When congestion has cleared, odd days in bed may help a great deal in forestalling a relapse, and an occasional mercurial diuretic in addition to continuous digitalis therapy may prevent cardiac asthma. Optimistic handling is important. Vitamin deficiency must be excluded, for many old people find difficulty in obtaining sufficient food.

THE ELECTROCARDIOGRAM IN OLD AGE

Does the electrocardiogram of normal old age differ from that in younger persons? It is not surprising that we should have difficulty in replying to this we are continually discounting more and more abnormalities in the young. The range of the electrocardiograms of healthy young men to the likelihood of the aged electrocardiogram difficult to interpret as regards pathological I believe that the same criteria of normality applied to the old, but that some features, such axis-deviation, should be recognised as having prognostic significance. The same applies to the T A T I inversion in a man aged 70 is not so *prognostically as in a man aged 50, for the* the former are naturally less than on the latter, at both ages ischæmia of part of the myocardium be responsible. It is often found in healthy old but a normal electrocardiogram in every way rarer in an aged person than is the incidence of old age. A normal electrocardiogram by the young is never pathological for the old, just children a normal right pectoral lead is not pathol because so many children have an inverted T in lead. This reference to children, however, make hesitate to carry too far the idea that an electroc gram in an aged person should not deviate fro accepted normal for young adults. Just as growth alter the average pattern of the electrocardiogra may old age do so in devolution. Yet, as co disease is in the differential diagnosis from n

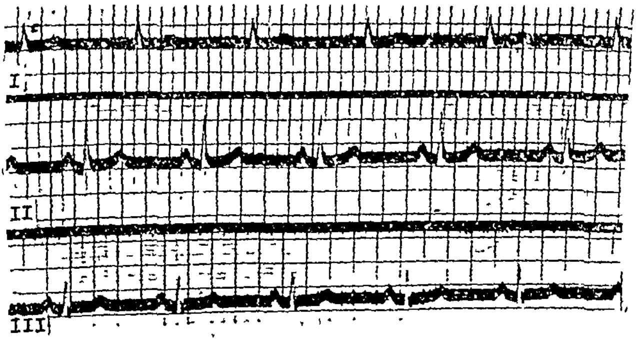


Fig. 6—Normal electrocardiogram in man aged 80.

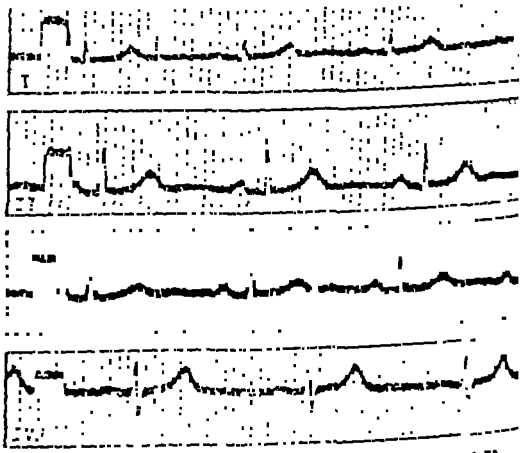
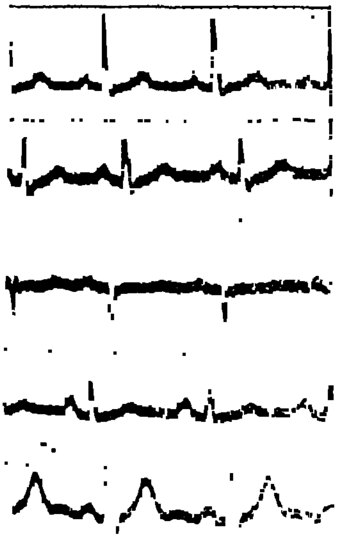


Fig. 7—Normal electrocardiogram in man aged 70.

I feel it is correct not to accept readily as physiol for old age any deviation from the so-called "nor Fortunately we now have the help of chest lea regards left axis-deviation and coronary changes; so far as the standard leads go, we should rega pathological deviations from *the criteria* appli electrocardiograms of young persons, even thoug may take no action based thereon.

Analyses of the electrocardiographic finding healthy old folk show wide discrepancies, be patients studied on the ground that they were n revealed in a substantial proportion such ob abnormalities as auricular fibrillation, bundle-b block, hypertension, and cardiac enlargement. centages of "normal" electrocardiograms vari follows: 15% in ambulant males and females ove age of 70 (Eliaser and Kondo 1941); 33% in amb males and females aged 60 or more (Fox et al. 1 51% in ambulant males aged 60 or more (Fox 1948); and 74% in 100 males and females over th of 70 (Levitt 1939). This is clearly unsatisfac and, until a better correlation between clinical, ele cardiographic, and pathological material is avail *it is practical to use the same criteria* as in youth



—Normal electrocardiogram in man
74, showing effect of inspiration on
III.

ard the electrocardiogram as of less diagnostic rognostic importance in the aged than in the . The tendency is to rely too much on minor changes in the electrocardiogram, thus causing unnecessary invalidism. If we recall that gross disease of the heart, such as angina, may sometimes reveal no electrocardiographic changes, even after exercise, we shall return more humbly to the fundamental anamnesis in all cases.

If we cannot define absolutely a normal electrocardiogram for old age we can at least profit by studying the tracings in our atients who come to us for advice, and so reach ctical if not precise scientific conclusion. To this end se 200 consecutive patients, including 75 of my own, 70 or more, for analysis of their first electrocardio- s (table II). All these patients were submitted to ocardiography because it seemed indicated clinically. diagnoses therefore include all kinds of heart-disease in the aged. It will be seen that several rmalities are no commoner than in the so-called rmal" series cited above. The patients were aged , average 74; 21 were over 80.

ythm.—Normal rhythm (figs. 6–8) was present in %, with an average rate of 77 per minute, and all rhythms made up 82% of the total. *Sinus arrhyth-* was specially prominent in 1 patient, with a rate ing from 35 to 75 per minute: she complained only casional faintness. *Sinus bradycardia* was especially ounced in 2 patients, with rates of 38 and 32 per te (fig. 9). Both of these had attacks of loss of ciousness which simulated Adams-Stokes seizures were less abrupt in onset and offset and lasted longer. *illation* of the auricles accounted for 14·5%, with average ventricular rate of 95, higher than is com- ly thought to occur in old age. Only half showed te under 100. *Flutter* (fig. 10) was rare (0·5%); insonian tremor, so common in the old, may occa- ally simulate flutter, but lead III, not lead II, shows added waves (fig. 11); and *paroxysmal tachycardia*, uricular and 1 ventricular, was found in 2 cases h severe cardiac infarction.

rolongation of P–R Interval.—This was prolonged ond 0 2 sec. in only 11·5%. Apart from the non- us rhythms the percentage rises to 14%, still fewer n expected. In 3 cases the P–R interval was very ch prolonged (to almost 0·4 sec.), yet there were no pped beats.

Heart-block.—Complete heart-block was found in 2%. e incidence of *bundle-branch block* was 5%, less an that found by Eliaser and Kondo (1941)—12% healthy aged persons. Right bundle-branch block, wever, was not found in his series, and this abnormality undoubtedly has the more serious significance. The incidence of right and left bundle-branch block was equal in my series. All conduction defects, excluding minor abnormalities of the Q R S, amounted to 18·5%. Q I was prominent in 25·5% of cases, which is much higher than in "normal" series.

T-wave Changes.—In 39% there was an abnormal T I, and T III was alone abnormal in 21%. It is notable that in this series T was upright without R–T deviation in the three limb leads in 23·5%, indicating once more that heart-disease may often not be manifest electrocardiographically. The T waves and R–T segments are not further analysed, for they include changes due to coronary infarction and digitalis. The chest leads CR 1, 4, and 7 were tested in 40 patients, and the T wave in one of these groups was abnormal in 30%. T CR I was negative in 2 cases when the limb leads were normal, except for T III negative in 1 case; otherwise the chest leads did not reveal anything not suspected from the limb leads.

TABLE II—ELECTROCARDIOGRAPHIC FINDINGS IN 200 PATIENTS AGED 70 OR MORE

Findings	No. of cases	Av. heart-rate	Limits
Normal rhythm.. ..	123 *(61·5%)*	77	51–99
Sinus tachycardia ..	25 *(12·5%)*	103	100–120
Sinus bradycardia ..	5 *(2·5%)*	43	32–50
Sinus arrhythmia ..	11 *(5·5%)*	78	35–100
All sinus rhythms ..	164 *(82%)*	79	..
Auricular fibrillation ..	29 *(14·5%)*	95	43–150
Auricular flutter ..	1 *(0·5%)*	130	..
Paroxysmal tachycardia:	2 *(1%)*	..	..
Auricular	1 *(0·5%)*	160	..
Ventricular	1 *(0·5%)*	120	..
A-V conduction time (P-R interval):			
Normal	110 *(55%)*	..	..
Short	1 *(0·5%)*	..	..
0·2 sec.	29 *(14·5%)*	..	..
Longer than 0·2 sec.. .	23 *(11·5%)*	..	..
Complete heart-block ..	4 *(2%)*	Aur. rate 79 Vent. rate 32	..
Bundle-branch block: ..	10 *(5%)*	..	..
Left	5 *(2·5%)*	..	..
Right	5 *(2·5%)*	..	..
P waves abnormal ..	71 *(35·5%)*	..	..
Q R S:			
Wide	11 *(5·5%)*	..	..
Slurred and notched..	6 *(3%)*	..	..
Q:			
None in standard leads	122 *(61%)*	..	..
Q I only	51 *(25·5%)*	..	..
Q III only	12 *(6%)*	..	..
Q in more than 1 lead	15 *(7·5%)*	..	..
T changes in standard leads:			
T up in I, II, III, and no R-T deviation ..	47 *(23·5%)*	..	..
T I negative	30 } 78 *(39%)*		
T I flat or diphasic ..	48	..	..
T III: Negative, flat, or diphasic (no other abnormality in R-T or T)	42 *(21%)*	..	..
T changes in chest leads (40 cases only):			
T up in CR 1, 4, 7 ..	28 *(70%)*	..	..
T abnormal	12 *(30%)*	..	..
U wave present ..	30 *(15%)*	..	..
Voltage:			
Low	11 *(5·5%)*	..	..
High	10 *(5%)*	..	..
Axis deviation:			
Right	7 *(3·5%)*		
Left	142 *(71%)*	..	..
Extrasystoles:	51 *(25·5%)*		
Auricular	13 *(6·5%)*		
Ventricular	31 *(15·5%)*		
Auricular and ventricular	5 *(2·5%)*	..	..
Nodal and multifocal	2 *(1%)*		
More than 3 per half minute	19 *(9·5%)*	..	..

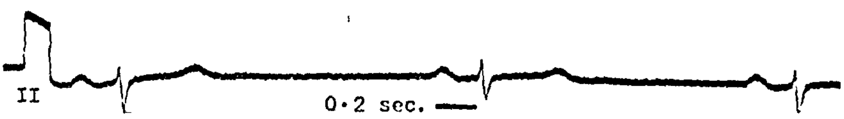


Fig. 9—Sinus bradycardia (32) in man aged 78, showing P–R greater than 0·2 sec.

U Wave.—This was present in 15% of cases in the standard limb leads, mostly in lead III. U IV or CRA was present in 36 cases in which the limb leads did not reveal it, and of these 7 were negative. All the latter patients with U negative showed gross disease; recent coronary infarction, heart-block, and great left ventricular hypertrophy. But a negative U was never the sole abnormality in the electrocardiogram.

Voltage.—Much has been written of a diminished voltage (fig. 12) being characteristic of old age, but it was found in only 5·5% of my series, and the voltage was considered low more liberally than the standard of 5 mm. set by the American Heart Association. The voltage in lead I was sometimes relatively low, as expected from the presence of emphysema. The high-voltage cases were usually hypertensive with enlarged left ventricles, but high voltage was not a common feature, even in the hypertensive group.

Axis-deviation.—As many as 71% showed left axis-deviation (figs. 13–16). A raised diaphragm accounted for some, since deep inspiration removed the axis-deviation in 14 of 35 of these patients in whom it was tried. This is not an infallible test, for occasionally a grossly hypertensive electrocardiogram with T I change may show loss of left axis-deviation in the limb leads on deep inspiration. Fig. 16 shows slowly progressive hypertensive changes in an old man. Only 3·5% of patients had right axis-deviation, and of those 7 patients 3 had auricular fibrillation, 1 auricular flutter, and 3 bundle-branch block. A quarter of the patients had no axis-deviation, and perhaps more would show a left one were it not for the influence of the common auricular fibrillation and emphysema. Yet one should not regard left axis-deviation as normal unless it is easily removed by inspiration and the chest leads reveal no corresponding abnormality.

Extrasystoles.—Many have regarded the occurrence of extrasystoles as of no greater significance at the age of 80 than at that of 20. Some have said that they produce fewer symptoms in old age (Eliaser and Kondo 1941). But caution is required, for despite reassurance of the patient they may still cause faintness and discomfort; and, if they appear in an elderly person who was known not to have them before, a careful history and examination may reveal the cause—e.g., a recent silent coronary thrombosis. If they are numerous, something is probably wrong, but other evidence will be found if sought. In doubtful circumstances a few weeks' observation may be better than dismissal with only. *Nevertheless most* be reassured when the sole finding. In 25·5% series extrasystoles were in a third of these they 3 per half-minute. extrasystoles were twice as common as

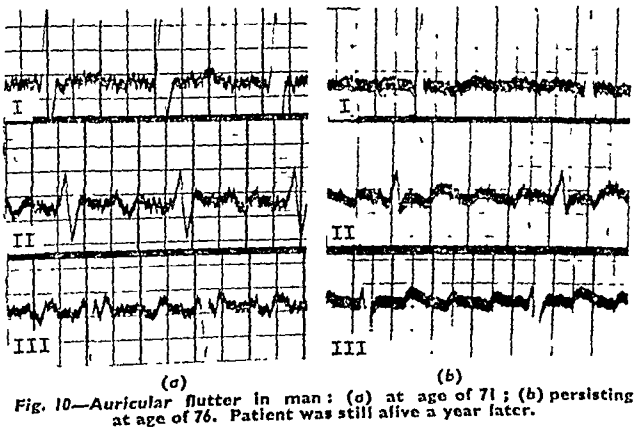


Fig. 10—Auricular flutter in man: (a) at age of 71; (b) persisting at age of 76. Patient was still alive a year later.

Conclusion.—I think all will agree that the feature is that so many aged folk have an cardiogram which deviates but little from the normal for young adults, when heart-disease is suspected. On the other hand, abnormalities electrocardiogram which do not depart gross normal—e.g., a prolonged P–R interval, and flattening—do not have the same prognostic as in the younger groups, even though they indicate the same nature of process at ischæmic fibrosis in the myocardium. Such cardiographic changes are compatible with a " *old age.*

RADIOLOGY OF THE SENILE HEART

Analysis of the radiological appearances of th in old people reveals variety of configuration. scoliosis is very common and is found in about cases. It i times gross diaphragm raised, sor with asymm a fifth c cases. Thi the heart an it a transve The diaphr low in the propor Considera cursion diaphrag remain in and its imp in the est of heart size shown in and 18. Calci of the costa lages is not its absence, except occasionally in the first rib radiological finding is borne out by necropsy, costal cartilages are cut with ease, as noted by (1635) in the case of old Parr and by H (1889).

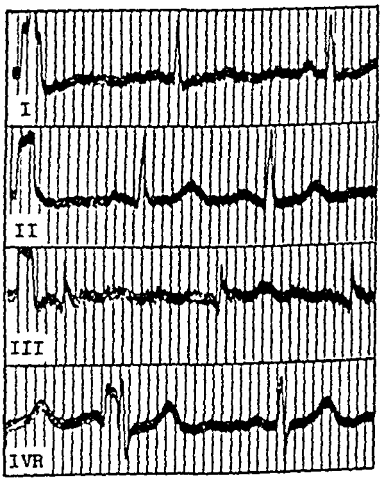
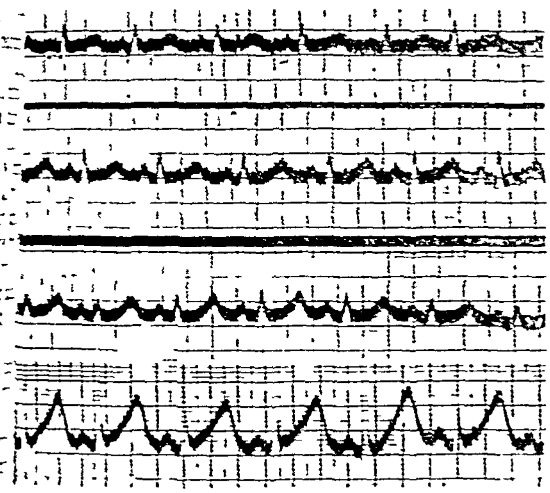


Fig. 11—Parkinsonian tremor simulating flutter in woman aged 70.

The heart and aorta may appear the same young persons, but this is the exception (fig. is by such standards that we should judge bi age. The pulsatile excursion of the heart d decrease with age. The aorta is usually unfol dilated to a variable degree (fig. 19), which se be independent of the height of the blood-p It is common to find a large heart in hyper with a minimal degree of unfolding and, on th hand, gross unfolding in non-hypertensives. tensives without cardiac enlargement may show much unfolding or none (fig. 20). A doubl knob, one within the other, is occasionally seen Kyphosis allows a good view of the unfolded a the left oblique position, in which we may also apex of the heart tilted upwards by a rigid u aorta (fig. 22). Ruffin et al. (1941) described condition termed by them senile ectasia of the There was local dilatation in the ascending aor arteriosclerotic. They described 3 cases, 1 with r *The average age was 71.* This is perhaps the only

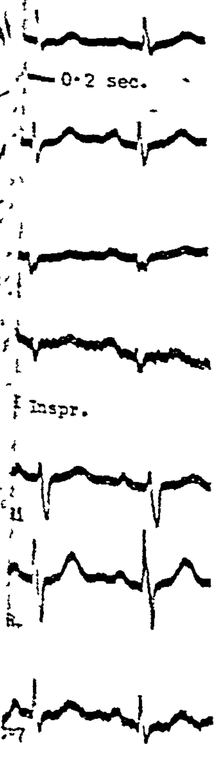


2—Low-voltage curve in electrocardiogram of man aged 71.

vascular condition confined to old age. I have ample of this or of arteriosclerotic aneurysm of oracic aorta, but 4 of my patients had abdominal osclerotic aneurysms (fig. 2). I have not seen hilitic aneurysm in a patient over the age of 70, xamples may occur.

ar congestion is valuable evidence of heart-failure 3). In emphysema the hilar root shadows are well and the right pulmonary artery stands out in the oblique position, though the main stem may not be ment in this position or in the postero-anterior. sionally the conus of the right ventricle humps the order of an otherwise normal heart, as in fig. 24. tal enlargement is characteristic of the fibrillators of long standing (fig. 25).

Unfortunately we cannot judge the thickness of the ventricles except by their outward shape, and angiocardiography has disappointed us in this; hence we still conveniently speak of enlargement. The aged heart does not often attain to great size (fig. 26 shows the largest in the series), and radiological help in deciding whether or not asthma is cardiac is not so often forthcoming as in younger persons. Yet at necropsy the cardiac muscle may be thicker than expected radiologically.



13—Left axis-deviation persisting with inspiration (T up all leads) in man aged 75 with blood-pressure 15: 90.

RISK OF OPERATION IN CARDIAC CASES

I have studied, immediately before or after operation, 51 aged patients, many of them in consultation because their cases were not straightforward. These included every grade of operation. 9 died, all of them after major operations, such as prostatectomy, excision of breast, and laparotomy for various carcinomas. Two emergencies, one a gangrenous appendix and the other a perforated gastric ulcer, were included.

It is difficult to apportion the part played by a failing heart in these fatal cases. In emergencies the risk of a faulty heart must be taken. A male, aged 76, with a gangrenous appendix, developed flutter at operation which was otherwise well borne, and paralytic ileus determined death on the eighth day. Digitalis and quinidine did not help, but congestive failure appeared only during the last two days. The other emergency case was a woman, aged 70, in whom auricular fibrillation supervened some days after operation which was well tolerated, but she died of heart-failure with a high ventricular rate uncontrolled by digitalis. Possibly an embolus was the reason, but permission for a necropsy was not obtained.

Both these patients illustrate how the heart may contribute to a fatal postoperative outcome though the operation itself was well borne. Arrhythmias are particularly common when there is toxæmia from peritonitis, as in the first case.

Of 7 fatal cases operated on deliberately, in only 1 could it be said that a better appreciation of the heart condition might perhaps have saved life by avoiding operation, however desirable it was as proper treatment for the local lesion. This condition arose in a woman, aged 77, with a blood-pressure of 160/110, who had a radical mastectomy and died on the eighth day, having developed auricular fibrillation at operation. Her enlarged heart weighed 18 oz., and the mode of death was characteristic of progressive cerebral anæmia, a state emphasised by Howell (1944).

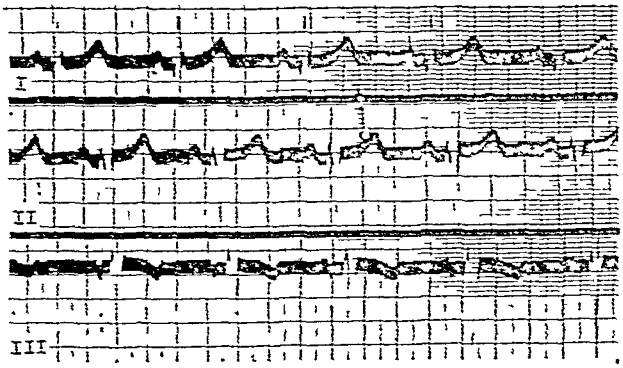


Fig. 14—Normal rhythm in woman aged 73 with left axis-deviation: T I and II well developed; T III negative. This type of record demands further investigation with deep inspiration and chest leads.

In 4 of the 9 fatal cases the patients died within twenty-four hours of operation, 3 from shock and 1 from massive collapse of both lungs.

The highest blood-pressure in the fatal cases was 160/110 mm. Hg. It is my impression that, provided the heart is not much enlarged and arteriosclerosis not pronounced, old people with hypertension stand operations as well as, probably better than, non-hypertensive patients. Early treatment of operative shock is vital in both classes. Modern anæsthesia is so good that much more can be undertaken than formerly; and, if postoperative bronchopneumonia develops despite breathing-exercises, penicillin and sulphonamides control it and so save the heart both a mechanical and a toxic burden.

It must be remembered that the physician sees a higher percentage of pathological hearts when called to surgical cases than is found in the general surgical series, for the simpler cases are dealt with by junior staff. The physician must have a very good reason for precluding operation in the aged on cardiac grounds, but that operation must be indicated in the true medical sense. White (1946) says:

> "Radical measures of treatment, such as cholecystectomy, are not to be undertaken lightly, hoping to get out

thereby of some such condition as angina pectoris. Emergency operations may be justified, but a cardiac patient may be made worse, with the precipitation even of myocardial infarction or death, by an operation of choice or convenience."

The total assessment of nutrition, build, lungs, and mental outlook is as important as that of the heart in the average elderly patient.

Pulmonary Embolism.—Only 2 patients in my surgical series had pulmonary embolism, both after cataract extraction, and neither was fatal. Pulmonary emboli undoubtedly contribute more often to postoperative death than is clinically suspected. A pulmonary infarct may be relatively "silent," the aged person simply deteriorating in a general way rather like that seen in progressive cerebral anæmia. An unexpected tachycardia may be the only sign, or a "faint" may be precipitated by an embolus. Radiography helps in doubtful cases when a characteristic shadow appears, but its absence does not exclude an infarct.

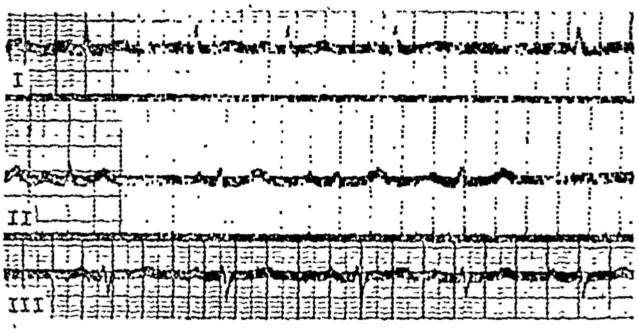


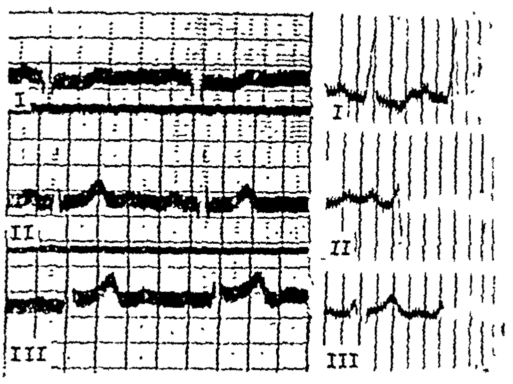
Fig. 15—Sinus arrhythmia in man aged 89 with left axis-deviation.

Non-fatal Cardiac Arrest.—A man, aged 70, with carcinoma of the bladder, had cardiac arrest during operation. The heart was immediately massaged, the man recovered, and the abdomen was closed. A few minutes later an electrocardiogram revealed bundle-branch block of the common type but showed no prolongation of the P–R interval to suggest that heart-block had occurred. The patient recovered from the anæsthetic in the usual way and was alert and remarkably well with no new signs. The electrocardiogram did not alter then or three months later, when the operation of prostatectomy and radium insertion was performed uneventfully. The risk was taken because relief from distressing local symptoms was imperative. This case emphasises the fact that the cerebral circulation and brain in the aged can sometimes recover from anoxæmia in a remarkable way. It is the more striking because there was widespread arteriosclerosis; the anterior and posterior tibial arteries had no palpable pulsation. This is a further example of the patchy distribution of arteriosclerosis in the aged.

Prostatectomy is in a class apart, and in modern surgery no man need be deprived of such great relief because of mere old age. No man is too old for prostatectomy. Decision rests on surgical and general medical grounds. A sample of 50 consecutive prostatectomies, excluding 2 deaths, shows that 17 of the patients were aged 70 or more (Millin 1947).

Saline Infusions.—A word of warning may be given here about postoperative infusions of saline when there is a possibility of incipient or masked central cardiac failure in the aged. Slight œdema of tissues caused thereby may turn the scale against the patient, who succumbs to pulmonary œdema of cardiac origin.

Injuries.—Contusion of the chest very easily induces auricular fibrillation in the old, and many examples were seen in air-raid casualties during the war.



(a) (b)

Fig. 16—Electrocardiograms of man: (a) at age of 71; showing increased hypertensive changes.

GENERAL MANAGEMENT OF AGED CA PATIENT

I have referred to this in dealing with heart-failure, but I now wish to emphasise a ciples. Above all we must treat the patient and diagnosis. Important as this is at any age, it in the old. For this reason we should not help from lay observers who have been long in with our patient; their appraisal of the patient less often of his disease) is so often right. Yet attitude is too often pessimistic, simply because old is wrongly regarded as a disease, and the should bring an atmosphere of optimism possible.

The autonomic and vascular systems are unstable in the old and not considered often. True visceral neuroses are common, and old provide the best examples of them. With management they are not very disabling; environment is unsatisfactory and an incorrect at is adopted by those round the patient, his is assured, when more serious illness sets in, by ting peripheral circulatory failure. The patient angina pectoris, for example, has enough to bear; if a visceral (heart) neurosis complicates, as often does, we can at least discuss it with the and save him unnecessary anxiety. There is no that there is room for more optimism and

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LEGENDS TO ILLUSTRATIONS ON PLATE

DR. GAVEY

Fig. 1—Normal heart and aorta in man, aged 75, with paroxy auricular fibrillation, slight scoliosis, and triangle of fat at ap

Fig. 2—Abdominal aneurysm in same patient as fig. 25.

Figs. 17 and 18—Hypertensive heart showing striking effect of diaphragm in expiration and inspiration on apparent heart man, aged 77, with aortic incompetence from atheroma and blood-pressure 170/70.

Fig. 19—Heart of average healthy man aged 75 with blood-pres 160/90, showing aorta unfolded.

Fig. 20—Normal heart and aorta in woman aged 76 with blood-pres 240/80. (Calcified pleural plaque at left hilum.)

Fig. 21—Heart of hypertensive woman aged 84 with blood-pres 180/110, showing aorta unfolded. Abdominal aneurysm was present.

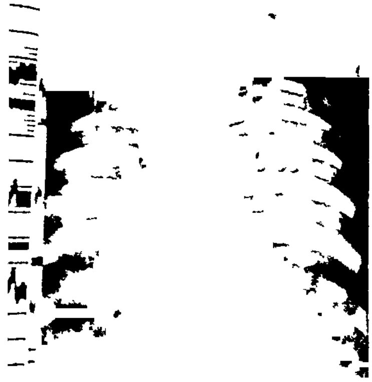
Fig. 22—Enlarged heart with apex tilted up by rigid unfolded aort hypertensive woman aged 71 with blood-pressure 170/120.

Fig. 23—Enlarged heart with hilar congestion due to failure precipita by gall-stone colic in man aged 78 with blood-pressure 190/100.

Fig. 24—Chronic cor pulmonale with enlargement of outflow trac right heart, due to emphysema, and normal aorta in man aged

Fig. 25—General enlargement of heart in man aged 72 with auricu fibrillation. Note small aortic knob.

Fig. 26—Hypertensive heart-failure with hydrothorax in man aged with blood-pressure 190/130. Heart weighed 22 oz. and was the larg of the series.



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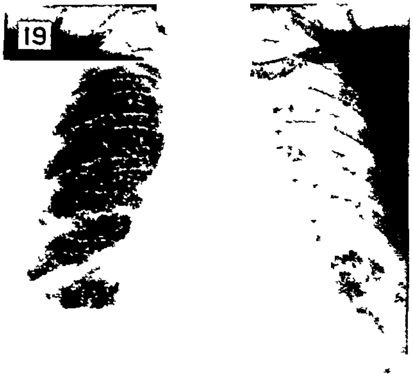

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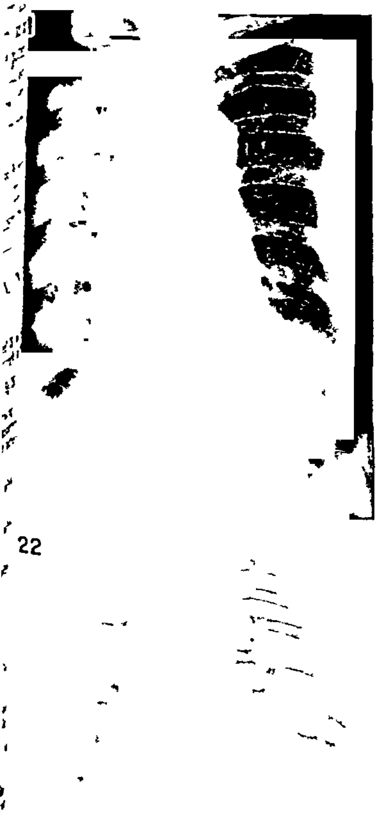

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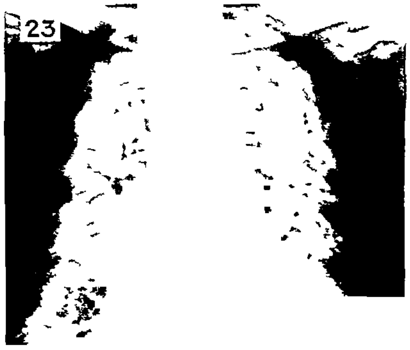

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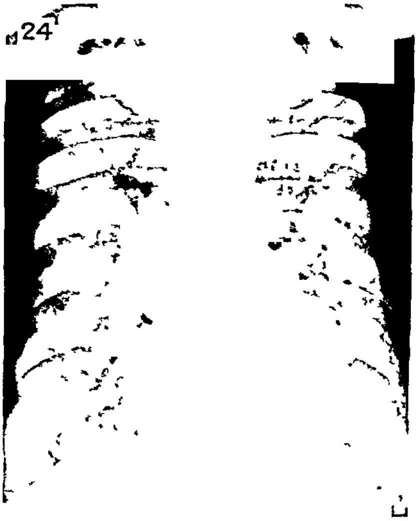

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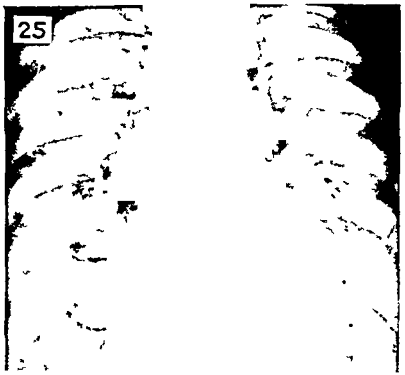

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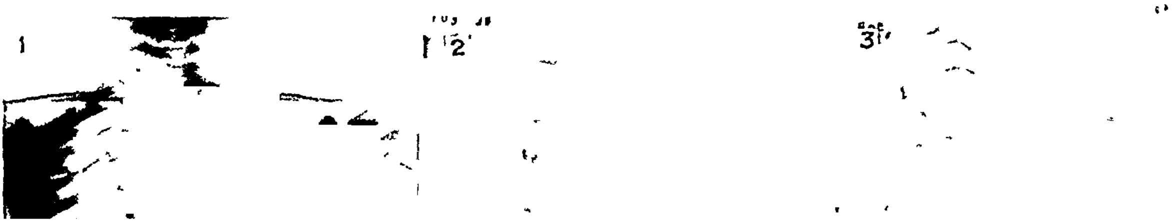
DRS. STANTON AND WILKINSON:
CALCIFIED PETROSPHENOIDAL LIGAMENT

DRS. WOOD AND ANDREWS.
SUBACUTE MYELOSCLEROSIS

DR. EVANS: TRIPLE HEART RHYTHM


DR. ROSENTHAL: STREPTOMYCIN IN FRIEDLÄNDER PNEUMONIA

.e treatment and management of the old than to be thought. Uncertainty is the enemy of ld. All aged persons realise that they have passed verage span of life: and. if the prospect of further is reasonable, we need not emphasise the imme- risks, for Cicero (*De Senectute*) says: "There is no young man who can promise himself that he live until sunset."

ough I have spoken as if the old are fearful of -disease. yet there are not a few who readily accept inevitable and as a complete explanation of troubles remote from the heart. It is imperative to ascertain d man's attitude to life if we are to help him. Much can be done by radical alteration of a patient's ronment; and, if conditions permit, it is best for to remain among his family and belongings. ession, which is so powerful an agent in the old, is by obviated.

insbury (1906) says an old person should lead a life mplative. not executive; but this does not mean ivity. Exercise, mental and physical, is salutary. nterest in the modern world should be encouraged. I recall the ancient councillor, aged 92, who remarked dubious project: "That is reactionary, not progress." discrimination is to be respected in the old.

make a plea for more study of the cardiology of age, for on the circulation all tissues ultimately nd.

e treat disease by rest, but what is the optimal unt of rest? It is very questionable whether the heart that has survived the shock of a coronary mbosis should be rested as long as the younger. ure of the heart after coronary thrombosis is in the old, probably because the demand made on so small, shortness of breath and faintness occurring readily before the heart is strained. Old age, as were, modifies the impact of exercise on the heart. complete rest is overdone, there is risk of further mbosis due to stasis of the circulation. and mural and emboli therefrom or from pelvic veins occur. Younger patients, in contrast, are more mobile. and muscular action in particular is so much more active even at rest, and stasis does not easily occur. If there is heart-failure after coronary thrombosis, there is no choice. The patient must stay in bed; but, if progress is satisfactory, three weeks in bed after coronary thrombosis in an aged person is the optimum required, and the use of a commode may be started after a week in some cases. Naturally the type of person will determine whether he shall be treated more like the younger or more like the oldest groups. A limited period of complete rest seems the more justified because coronary thrombosis in the aged is not so often associated with a large heart as in the young, and so the risk of congestive failure is considerably smaller.

The cause of death after initial survival from coronary thrombosis is probably different in the various age-groups, as I have indicated, and this needs further investigation. The reason why old persons who have survived the shock of a fractured femur do not develop coronary thrombosis more often after protracted rest in bed is that, being old, their vessels are patent enough even if sclerosed, and there is no factor determining thrombosis within the heart such as there is in a patient who has just survived coronary thrombosis.

Another problem is that of auricular fibrillation and the use of quinidine. Should one try to restore normal rhythm, and so remove that strain on the heart, but in so doing allow the appearance of angina of effort? We know that many patients with angina lose it when fibrillation comes on. As I have shown above I think that the indication for quinidine in auricular fibrillation of the aged is confined to postoperative auricular fibrillation, and I here add thyrotoxic fibrillation not removed by operation or by thiouracil.

Those are the kind of problems in old age which deserve much more extensive study. Finally, there is need for investigation of the aged heart that is not diseased, and a better knowledge of the stresses and strains to which it can be put without distress will help in the treatment of pathological hearts. It is remarkable, for example, how well old patients have tolerated electro-convulsive therapy for mental disorders (Moore 1947).

Let us study too the life histories of those of whom it may be said, as of Samuel Paget by his son Sir James (Paget 1901):

> "I had his good counsel and example till he died, at 82, of that most rare of all the causes of death—mere old age. He had never once been ill, and in the time of his gradual decay, nothing erred from its just proportion in the work of life; only there gradually became less of everything belonging to this life, and in due time everything slowly and coincidentally ceased."

SUMMARY

The results of a personal study of 360 patients aged 70 or more (34 over 80) are analysed and discussed. These include 100 eye-cases referred for general medical examination.

Among the ætiological types of heart-disease hypertension and coronary disease were dominant. The average blood-pressure was 188/102, and two-thirds of the patients were hypertensive.

Arteriosclerosis, common enough, was less often advanced than generally thought, and about a tenth had clinically normal vessels and no hypertension.

No useful clinical correlation was found between the various degrees of arteriosclerosis in different parts of the body—e.g., between retinal and radial arteries.

Congestive heart-failure, present in 12·7%, remained amenable to the usual forms of treatment, and the partnership between digitalis and mercurial diuretics remained firm.

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. STANTON, DR. WILKINSON

1—Lateral radiogram showing calcified petrosphenoidal ligament.

2—Radiogram taken in Towne's position and showing calcified etrosphenoidal ligament.

DR. EVANS

1—Slight enlargement of the heart and much pulmonary congestion om cardiac infarction.

2—Moderate enlargement of the heart and pulmonary congestion om cardiac infarction.

DR. WOOD, DR. ANDREWS

1—Marrow showing supersession of marrow by fine fibrosis (case 1). Hæmatoxylin and eosin, × 150.)

2—Lower end of femur (case 2) showing great increase of bony rabeculæ and foci of metastatic bone-formation (indicated by arrows). he place of the marrow is largely taken by degenerate eosinophilic aterial. (Hæmatoxylin and eosin, × 22.)

3—Sections of bones at same level at lower end of femur: (*a*) arrow rim of cortex and great increase in density of spongiosa, ving homogeneous appearance (case 2); (*b*) almost complete lling of medullary cavity with coarse bony trabeculæ (case 1);) from a case of acute myeloid leukæmia in which there was some of the corticalis but no increase of bony trabeculæ in medullary cavity, which was filled with hyperplastic marrow.

DR. ROSENTHAL

ig. 1—Four days after admission. The left lung field is unequally dense, but the base is translucent posteriorly, and there is a dense patch in middle zone of right lung.

2—Taken three days before start of streptomycin therapy. The right lung has cleared considerably. Two large cavities in left lung contain fluid.

3—Film taken on May 7, 1949, after four weeks' streptomycin therapy and three weeks' postural drainage. The cavities in the left lung are closing and do not contain fluid. There is mediastinal shift to the left.

Electrocardiographic and radiological studies not uncommonly revealed normal appearances by standards accepted for young adults, suggesting that these standards remain correct for old age, though minor departures can have less prognostic significance.

The problems of operative risk are illustrated, and the general management of old patients reviewed.

The field for further investigation of the cardiology of old age is explored.

I wish to acknowledge collectively my indebtedness to all my chiefs and colleagues, medical and surgical, at the three hospitals mentioned, for the privilege of examining some of their patients; and to Sir John Parkinson in particular, to whom I owe my basic experience of cardiology.

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FAMILIAL CALCIFICATION OF THE PETROSPHENOIDAL LIGAMENT

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With illustrations on plate

WE report here a family of twelve adults, all of whom showed radiological evidence of calcification of the petrosphenoidal ligament.

Calcification in the dura mater has been described by many writers, including Ström (1920), O'Sullivan (1925), Camp (1930), and Dyke (1930). In nearly all cases the calcification described has been in the falx, and calcification in the tentorium has received little attention. Ström (1920), in his extensive review of intracranial calcifications, does not mention calcification in the tentorium, and Halstead and Christopher (1923) state that this is the rarest form of dural calcification. On the other hand, Camp (1930) writes that in his experience calcification is common in the tentorium, particularly in the portion between the dorsum sellæ and the petrous part of the temporal bone. This site for calcification is also mentioned by O'Sullivan (1925 Löw-Beer (1932). Quain (1915) describes this the tentorium as a fibrous band extending from forepart of the superior border of the petrous part the temporal bone to the lateral margin of the do sellæ of the sphenoid bone. He calls this the pet sphenoid ligament and states that in rare cases becomes ossified, thus completing a foramen which pass the inferior petrosal sinus and the cent nerve. This ligament is sometimes called petroclinoid ligament.

Since no figures are given by the workers cited for frequency of calcification in the petrosphenoidal ligame we have examined 783 normal skulls radiographic for this feature. The calcification is best seen in lateral radiogram (fig. 1), but may also be seen Towne's position (fig. 2).

We have divided the calcifications into three grades

Grade 1, in which there is only slight evidence of calcifi tion, usually taking the form of a hook directed backward and downwards from the posterior clinoid process.

Grade 2, in which there is a greater degree of calcification but it is incomplete.

Grade 3, in which there is an unbroken line of calcificatio running from the posterior clinoid process to the apex of th petrous part of the temporal bone.

The results of this investigation are as follows:

Total no. of normal skulls	783
No. showing calcification of petrosphenoidal ligament:	
Grade 1	63 (
Grade 2	26 (
Grade 3	8 (
Total	97 (

To determine if the degree of calcification in t petrosphenoidal ligament is proportional to that in oth intracranial sites, we examined radiograms of 227 sku with evidence of calcification in the falx, other pa of the dura, or the choroid-plexuses, and obtained t following figures:

Total no. of skulls showing other intracranial calcification	227
No. showing calcification of petrosphenoidal ligament:	
Grade 1	30 (
Grade 2	9 (
Grade 3	5 (
Total	44 (

Skulls showing calcification in the pineal body with calcification elsewhere have not been included in t group, because of the high incidence of calcification the pineal body—51% (Dyke 1930). Our results sh a positive correlation between frequency of calcificat in the petrosphenoidal ligament and of that elsewh in the cranial cavity.

The family which we describe shows a remarka high incidence of calcification in the ligament.

A family of Russian Jewish descent and domiciled England for the last 45 years came to our notice when t members attended the outpatient department of Maida V Hospital for treatment. One had epilepsy and the ot migraine, and in the radiograms of their skulls each sho grade-3 calcification of the petrosphenoidal ligament. other members of the family are in good health except father, who for several years has had bronchitis and he failure. Radiography of their skulls gave the follow results: in the first generation, the father showed grad and the mother grade-1 calcification; in the second gen tion of nine siblings, five showed grade-3, three sho grade-2, and one showed grade-1 calcification; in the th generation four members were examined, one of whom girl aged 18—showed grade-1 calcification, and the ot —all children under the age of 12 years—showed calcification of the ligament.

We have described this family because we have b unable to find any published reference to a fami tendency to calcification of the petrosphenoidal ligam ır as we can determine, the calcification has no al significance.

wish to thank Dr. W. Russell Brain and Dr. J. W. D. for their advice on the presentation of this report, and D. Webb for preparing the radiograms.

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PLE HEART RHYTHM AS A SIGN OF CARDIAC PAIN

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With illustrations on plate

salient cardiac infarction the chest pain is both ng and lasting, and the widespread injury to the rt produces physical signs which are easy to discover. ıs, the patient is pale, cold, and usually sweating er the stress of almost unbearable pain; the temature at the time is below normal, the pulse is small, the blood pressure has fallen; the heart sounds are ant with triple heart rhythm, and occasionally a icardial friction sound is heard; the electrodiogram in such a patient is abnormal, giving proof he diagnosis.

Vith the other kind of chest pain, from *restricted* diac infarction, there are no such obvious physical ns. The pain itself is less severe, neither lasting as g nor causing symptoms of shock; often the pain is y induced by effort and quickly yields to rest; patients remain ambulant and they may make only ual reference to their disability. Up to now the ntification of coronary artery disease in patients hin this group has not been helped by clinical amination, and it has been left to electrocardiography decide the diagnosis.

It was this paucity of clinical signs which led to a re critical examination of the symptoms and signs in tients with chest pain and without either valvular disease or hypertension. Of 285 such patients examined in 1948, in whom the character and the situation of the pain, along with its relation to effort and to rest, made it likely that it was cardiac pain arising from coronary artery disease, in 139 the electrocardiogram was physiological and no abnormal physical signs were found. In the remaining 146 a subsequent electrocardiogram showed evidence of cardiac infarction, confirming the presence of true cardiac pain in each. In this group patient after patient showed a characteristic triple heart rhythm on auscultation, and it soon became apparent that triple heart rhythm in any patient with chest pain predicted unerringly the electrocardiogram identified with cardiac infarction. Triple heart rhythm was specially examined for its characteristics and for the conditions which determined its presence.

BLE I—CLINICAL SIGNS IN 285 PATIENTS WITH SYMPTOMS TYPIFYING CARDIAC PAIN, 146 OF THEM WITH CARDIAC INFARCTION. OPEN FIGURES DENOTE NUMBER OF CASES AND BRACKETED FIGURES DENOTE APPROXIMATE PERCENTAGE

Clinical state	Cardiac infarction 146		Chest pain, with normal electrocardiogram but never with triple heart rhythm 139
	Dual heart rhythm 105 (72%)	Triple heart rhythm 41 (28%)	
ood pressure:			
High normal	20 (19%)	2 (5%)	Variable
Normal	83 (79%)	36 (88%)	
Low	2 (2%)	3 (7%)	
ature of pain:			
Brief and only on effort	22 (22%)	5 (12%)	64 (46%)
Long and at rest ..	83 (78%)	36 (88%)	75 (54%)
lace of infarct:			
Anterior	32 (30%)	16 (39%)	Normal tracing
Posterior	43 (41%)	16 (39%)	
Lateral	22 (22%)	7 (12%)	
Various	8 (7%)	2 (10%)	
ardiac enlargement ..	37 (35%)	27 (65%)	None
eart failure	7 (6%)	20 (49%)	None

NATURE OF THE TRIPLE HEART RHYTHM

That a triple heart rhythm occurs early in cardiac infarction is known (White 1928, Parsonnet and Hyman 1931, Thompson and Levine 1936, Master et al. 1937), and it is only necessary to emphasise its common incidence in patients where cardiac infarction sets in abruptly and is accompanied with severe shock. But this paper is concerned with the ambulant patient who is susceptible to chest pain during effort, especially walking (cardiac ischæmia or angina pectoris of effort), which is quickly relieved by resting, or which occasionally comes while at rest, lasting a little time but not causing distress.

TABLE II—INCIDENCE OF CARDIAC ENLARGEMENT AND HEART FAILURE IN 146 PATIENTS WITH CARDIAC INFARCTION. FIGURES DENOTE NUMBER OF CASES

Incidence of cardiac enlargement and heart failure	Cardiac infarction 146	
	Dual heart rhythm 105	Triple heart rhythm 41
Cardiac enlargement alone ..	31	10
Pulmonary congestion alone ..	1	3
Cardiac enlargement and pulmonary congestion	6	17
No cardiac enlargement and no pulmonary congestion ..	67	11

Audibility

The triple heart rhythm was sometimes moderately loud, but generally it was less well heard, and it is for this reason that the sign, if not elicited easily, should be sought deliberately. *Induced tachycardia* caused the triple rhythm to become more distinct, but seldom did this test bring the added sound into being when it had been absent with a normal heart rate; yet, since this did at times happen, auscultation should be carried out after exercise if at the first examination only two heart sounds are heard. The triple rhythm was always better heard in the *reclining posture* in those cases where it was present in the upright posture as well. In the majority of patients, however, the sign was only found in the reclining posture. It was best heard at the *lower end of the sternum*, and where the triple rhythm was elicited only by careful auscultation it was confined to this area. When the auscultatory sign was more distinct it was audible towards the mitral area as well.

Incidence

Among the ambulant patients with chest pain which historically presented all the characteristics of cardiac pain there were 146 in whom a subsequent electrocardiogram showed clear evidence of cardiac infarction. A triple heart rhythm was present in 41 (28%) of these; in the remaining 105 cases only two heart sounds (dual heart rhythm) were heard.

Ætiology

Neither the *sex* nor the *age* of the patient influenced the incidence of triple heart rhythm. The *frequency* with which the sign was met with in cases with *extensive* or salient cardiac infarction made it likely that in the present series of ambulant patients the sign would be commoner in those in whom the *onset of pain* had been recent; no such association, however, could be made out.

The state of the *blood pressure* was next considered, it being understood that no patient with hypertension was admitted into the series; hence none had hypertensive cardiovascular hypertrophy, cardiographic evidence of left ventricular preponderance, or a previous record of raised blood pressure. The cases were divided into three groups according to whether the blood pressure was a high normal value (e.g., 165/95), a normal value (e.g., 130/90), or a low value with a systolic pressure of 110 or under. Though the incidence of a low blood pressure was not significantly greater in patients with triple heart rhythm than in those with dual rhythm (7% against 2%), table I shows that the proportion with a high normal blood pressure was small among patients with triple rhythm (5% against 19%).

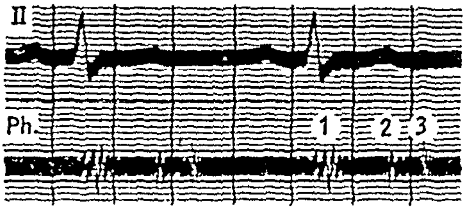

Fig. 3—Triple rhythm from addition of the third heart sound in cardiac infarction. Lead II of the electrocardiogram and the phonocardiogram are shown in this and subsequent figures.

When the *duration* of the paroxysm of pain and its onset while the *patient was at rest* were considered in relation to the added heart sound, it was found that, when the pain was induced only by effort and quickly yielded to resting, triple heart rhythm was less often present (12%) than when the attacks lasted longer and came on while the patient was at rest (88%). Since cardiac infarction was present in both groups, the longer attacks, with a higher incidence of triple rhythm, appeared to initiate triple rhythm not because of the duration of the pain but because the pain lasted longer if cardiac enlargement and heart failure were also present.

The *site of the infarct* appeared to have no influence in deciding the presence of triple rhythm, for a slightly higher incidence in anterior infarction and a slightly lower one in lateral infarction are not regarded as significant.

Cardiac enlargement, on the other hand, played a part in initiating the triple heart rhythm of cardiac infarction, for it was almost twice as common in patients with triple rhythm (65%) as in patients with dual rhythm (35%).

The incidence of *heart failure*, judged from the presence of pulmonary congestion on cardioscopy, was even more significant, because it was present in 49% of patients with triple rhythm and in only 6% of those with dual rhythm. Though this auscultatory sign w the absence of both cardiac enlargement and it was more likely to be present when either ditions presented, especially heart failure, larly if both occurred together (table II and fi

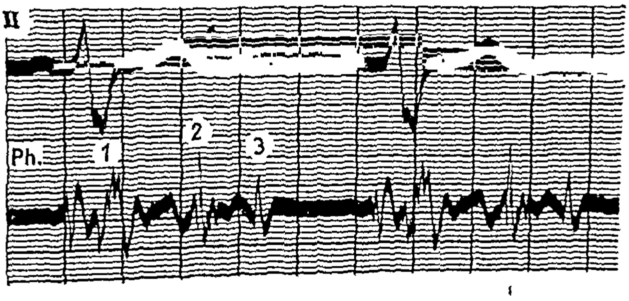

Fig. 4—Triple rhythm from addition of the third heart sound in cardiac infarction.

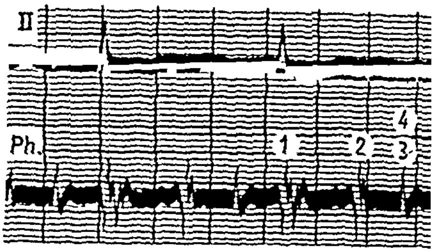

Fig. 5—Summation triple rhythm where the fourth h auricular sound coincides with the third heart sou delayed A-V conduction, which has lengthened the the electrocardiogram.

DIFFERENTIAL DIAGNOSIS

The triple heart rhythm in cardiac infarc from the addition of the third heart sound (fi and as a rule no ancillary test beyond clinical is required to discover it. Indeed a triple rh adult with chest pain which is brought on by ph usually points to cardiac infarction. Triple he can, however, be simulated by two other con

In the first there is a delay in auriculo conduction of the cardiac impulse, which is prolongation of the P–R period in the electro and in this event the auricular or fourth heart earlier in diastole and near to the second h giving the impression that it is the third (fig. 5). For the diagnosis of this form of tri an electrocardiogram is necessary, though general distribution of this sign over the hea presence in the upright as well as in the reclini should give a clue.

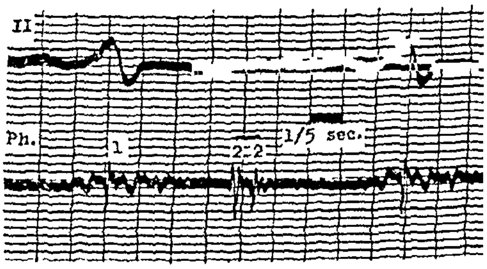

Fig. 6—Splitting of the second heart sound in bundle b

The second condition which may giv difficulty in diagnosis is bundle branch bl causes splitting of the second heart sound (fig additional sound in this instance, however, is the second heart sound, and, though a phono may be required to confirm the auscultatory whenever tachycardia frustrates its clinical r the finding of bundle branch block in th cardiogram is sufficient to infer this mechanis extraneous sound. Naturally the presence branch block in a patient with chest pain ma suggest that cardiac infarction has given ri auscultatory sign.

SUMMARY AND CONCLUSIONS

Owing to the paucity of physical signs, the of cardiac pain in a patient subject to recurren fort in the chest has hitherto been considered i without electrocar ɔain, and its relation to effort and to rest, cannot to distinguish cardiac pain from that which has a obscure origin and a less ominous meaning.

dia [illegible] of triple heart rhythm on [illegible] ested in 285 consecutive its with chest pain, in 146 of whom a subsequent ocardiogram showed cardiac infarction.

ole heart rhythm from addition of the third heart is of inestimable value in diagnosis. Its presence lower end of the sternum with the patient in the ng posture, provided by itself a diagnosis of c infarction in 41 out of 146 cases where the ocardiogram gave proof of infarction.

ong the factors which might determine the presence le heart rhythm in a patient with cardiac infarction, only—cardiac enlargement and especially heart , showing as pulmonary congestion on cardioscopy tributed to the appearance of this auscultatory Though triple rhythm was sometimes present ut either, it was more likely to be found in cardiac tion when heart enlargement and failure existed y side.

help obtained from triple heart rhythm in the osis of cardiac infarction as the cause of chest pain d encourage the clinician to seek it diligently. with the bell of the stethoscope at the lower end of ernum he must ask himself: “ Do I hear the third sound?” From such deliberate self-catechism in case a clinical recognition of cardiac infarction is le in over a quarter of the patients with chest pain iom a subsequent electrocardiogram confirms the osis.

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SUBACUTE MYELOSCLEROSIS

REPORT OF THREE CASES

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WEST CORNWALL GROUP OF HOSPITALS

With illustrations on plate

LEROSIS of the bone-marrow is associated with us clinical conditions. It is a not uncommon npaniment of refractory anæmia associated with co-erythroblastic blood picture. It is found in cases nting clinically as leukæmia or aleukæmic leukæmia still more commonly in those cases described by ling (1937) and others as non-leukæmic myelosis. is also been described in exhaustion states of the -marrow, particularly those associated with tuber-is (Crail et al. 1948), and has been attributed to ication by fluorine, lead, arsenic, phosphorus, and ne dyes (Jacobson 1933).

yelosclerosis must not be confused with osteopetrosis arble-bone disease, described by Albers-Schonberg 4), in which there is excessive calcification of the ex with defective ossification as shown by absence one lamellæ and osteoblasts. Pathologically the ntial finding in myelosclerosis is an obliteration of marrow cavity by connective tissue either fibrous ony. Fibrous tissue takes the place of the cellular row, and this may or may not be followed by the ng down of bone in the fibrous reticulum and by the elopment of osteosclerosis.

RELATION TO LEUKÆMIA

n cases presenting as leukæmia it appears that fibrous ue follows intense cellular proliferation. Except in the rare form of monocytic leukæmia osteosclerosis does not often occur. In non-leukæmic myelosis a true osteosclerosis of the marrow is more common, and the medullary cavity may be found almost obliterated by a close network of bony trabeculæ so dense that little or no marrow is left in the meshes. Unlike the condition in marble-bone disease there is little cortical involvement. In fact there may be areas of osteoporosis and the radiographic appearance may suggest that the proliferating spongiosa is invading the cortex.

This type was first described by Heuck (1879). Much controversy has centred on its relation to the leukæmias, with which it is often confused clinically. Thus Heller et al. (1947) conclude that the criteria alleged to differentiate the two disorders do not withstand critical analysis. Vaughan and Harrison (1939), however, take the view, with which we agree, that myelosclerosis arises at a more primitive level of hæmopoiesis than does leukæmia. They postulate a stimulus to the reticulum cell of Maximow, which is the precursor of osteoblasts, fibroblasts, hæmopoietic cells both myeloid and erythroid, and giant megakaryocytes. This theory finds support from the wide variety of tissue response seen, from the presence in the peripheral blood of primitive cells such as hæmocytoblasts, and from the occasional presence of a polycythæmic and leukæmoid blood picture in the same case (Windholz and Foster 1947). Though the distinction between the two groups of cases appears at present to be academic, in future it may be of some importance, for one of them may be more responsive than the other to new forms of therapy, with a resulting difference in prognosis.

INCIDENCE

The incidence of myelosclerosis is difficult to assess. In cases of obscure anæmia, even today, the long bones are seldom radiographed and necropsy is not always complete. The recent literature suggests that myelofibrosis is much commoner than osteosclerosis. Churg and Wachstein (1944) reviewed 97 cases of leukæmia retrospectively and found that 6 showed myelofibrosis and 1 osteosclerosis. Hickling (1937) states that it is not at present possible to know how frequently osteosclerosis occurs in cases of myelosis (leukæmic and non-leukæmic). In both groups there are acute and chronic cases. He says there seems to be no clinical or hæmatological factor by which osteosclerosis can be demonstrated.

CLINICAL PICTURE AND HÆMATOLOGY

Clinical and hæmatological features have varied widely in the cases described. The great majority have run a long course and most of the patients have been elderly. Thus Sussman (1947) described 9 cases in late adult life; all ran a protracted course. A case reported by Windholz and Foster (1947) lasted thirty years. Hickling (1937) described 7 cases, all in late adult life: all ran a protracted course.

In the few acute or subacute cases described the age-incidence has tended to be lower and the course shorter. Thus Goodall (1912) described the case of a child, aged 2 months, with a leukæmoid blood picture in which multiple hæmorrhages, purpura, stomal ulcers, and moderate splenic enlargement were present. Death took place a few weeks from the onset, and necropsy revealed a remarkable degree of osteosclerosis affecting the humerus, femur, sternum, and ribs. Windholz and Foster (1947) describe a case of acute lymphatic leukæmia with osteosclerosis, which they claim to be the third of this type.

The patient was a boy aged 16, and the diagnosis was based on a white-cell count of 15,000 per c.mm., 82% being lymphoblasts. The illness, characterised by progressive weakness, hæmorrhages, jaundice, and enlargement of cervical glands and spleen, was fatal in nine weeks from the onset. Well-marked radiological evidence of osteosclerosis was found in *vertebræ, long bones, ribs, and pelvis.*

Cases have also been described by Jacobson (1933), Hässler and Krauspe (1933), and Rosenthal and Erf (1943). Follis et al. (1942) reports osteosclerotic changes in 5 cases of erythroblastosis fœtalis.

Our purpose in recording 3 cases of this type is to draw attention to the possibility of myelosclerosis as a complicating factor in cases of refractory anæmia and to the early development of bony changes. The clinical and hæmatological picture in these 3 cases differed considerably. All 3 patients died after comparatively short illnesses. In 2 of them radiological evidence of osteosclerosis was obtained during life. Our first case presented as a pyrexia for which no obvious cause could be found; there was a refractory anæmia, a few primitive leucocytes were found in the blood, and there were some bony changes. During the course of her illness this girl developed well-marked osteosclerosis with a hypoplastic bone-marrow. Splenomegaly was never a prominent feature and only occurred towards the end.

FIRST CASE

A girl aged 16, a grocer's assistant, was quite well up to Christmas, 1946, when she began to run a slight temperature in the evening and had pain in the right knee and thigh. At this time also she started to lose weight and looked pale. Menstruation, which had been scanty for three months, now ceased. She developed a papular rash, thought to be scabies, but this disappeared in a week and did not return. Pain at this time was severe, keeping her awake at night, and acute rheumatism was provisionally diagnosed by her doctor. Subsequently persistent localisation of pain in the right thigh region led to consideration of the possibility of osteomyelitis and radiography was undertaken to exclude this. The patient became progressively weaker towards the end of March and was admitted to hospital with a swelling of the right knee. Her temperature at this time showed an evening rise to 100°F and in subsequent weeks reached 102°F on several occasions. There was nothing relevant in her past or family history.

On examination the patient was thin and wasted, complexion and mucosæ. Pulse regular at 100; blood 120/65; heart normal in size clinically, with no bruits spleen, and kidneys not felt. No abdominal t right knee was swollen, without discoloration, and free fluid; it was painful on flexion. No glandular en was detected.

Blood.—A blood-count before admission gave the f figures:

Hæmoglobin	..	11%	Myelocytes	.. ..
Red cells	..	2,660,000 per c.mm.	Metamyelocytes	.. ..
White cells	..	5100 per c.mm.	Polymorphs	.. ..
			Monocytes	.. ..
			Lymphocytes	.. ..
			Eosinophils	.. ..
			Basophils	.. ..

Subsequent blood-counts are shown in the accompan table. The erythrocyte-sedimentation rate was 125 mm. in the first hour and 150 mm. in the second (Westergren).

Sternal puncture was attempted, the needle being introd into two tender areas in the sternum. There was d resistance to the entry of the needle, and the material drawn consisted of much blood with only scattered m cells, in which the predominant cell showed a large nu in which the nuclear chromatin was condensed into a sieve-like arrangement and there were exceptionally nucleoli. The cytoplasm was reduced in amount and Red-cell precursors were scanty. The possibility of mye or myelosclerosis was considered, and the long bones radiographed.

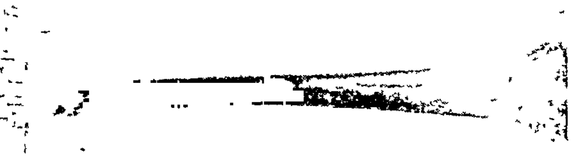
Radiologically there was some increase in density o femoral condyles and of the upper ends of the tibiæ. appeared to be some laying down of bone on the inner s of the cortex in the upper thirds of the tibiæ. There was irregular increase in density in the bodies of both tali a the juxta-articular bone of the tibia; punctate decalcific was observed in all the tarsal bones. The bone changes most marked round the ankle-joint, and the radio reported that he would have passed all the bones o these as within normal limits. An X-ray film of the femur taken after death showed irregular increase in de with the inner margins of the cortex ill defined (fig. 4).

Sternal puncture was again attempted in June, manubrium felt slightly less abnormal than the body

HÆMATOLOGICAL FINDINGS

Date	Red cells (million per c.mm.)	Hb % (14·8 g. per 100 ml. = 100%)	Colour-index	White cells per c.mm.	Reticulocytes %	Hæmocytoblasts %	Varieties of leucocytes (%) * Reticular cells	Myeloblasts	Promyelocytes	Myelocytes	Metamyelocytes	Polymorphs	Lymphocytes	Eosinophils	Normoblasts % †	Late normoblasts % †	Nucleated red cells per c.mm.	Other investigations
Case 1																		*Case 1*
March 8, 1947	2·6	41	0·9	5400	No response	..	..	..	..	8	..	60	32	..	..	..	..	Serum-protein = 4·25% min 3 %, globulin 1·25 %). No Bence-Jones protein Inorg. phosphorus 4 mg./1 Alk. phosphatase 25 (King Armstrong). Serum-calcium 9 2 100 ml. Wassermann reaction neg Fractional test-meal: low curve. Glucose tolerance normal. [illegible] 0 Blood-culture negat Blood-group O, Rh-nega
May 3, 1947	3·8	52	0·65	7400	..	..	..	..	..	..	..	..	..	..	..	..	..	
May 5, 1947	4·8	56	..	6200	2·2	..	..	5	..	3	..	49	40	3	..	..	..	
May 22, 1947	1·7	54	0·59	5600	..	..	..	7	..	2	..	62	29	..	..	3	..	
May 27, 1947	..	56	..	..	..	..	..	2	..	3	3	53	38	1	..	2	..	
July 24, 1947	..	65	..	7000	..	..	..	3	..	13	..	35	48	..	8	4	..	
Aug. 18, 1947	1·75	34	1·0	10,200	..	..	..	7	1	27	6	27	32	..	13	42	4000	
Case 2																		*Case 2*
Oct. 22, 1947	2·25	42	0·95	37,400	..	..	..	24	29	3	..	24	20	..	5	2	..	Wassermann reaction neg Blood-group O. 70 % of the leucocytes peroxidase-positive.
Bone-marrow Oct. 25, 1947	..	..	..	..	..	2	..	12	25	2	..	8	30	..	15 %	6 %	..	
Oct. 27, 1947	..	54	..	..	..	2	..	16	22	6	..	37	17	..	..	..	..	
Nov. 6, 1947	2·30	44	0·95	34,300	..	1	..	23	35	..	..	18	25	..	3	4	..	
Case 3																		*Case 3* Rh-posi
Nov. 5, 1948	1·34	12	0·43	13,600	<1	..	16	2	..	7	10	30	33	2*	2	..	..	
Nov. 8, 1948	1·78	32	0·98	5800	..	..	..	..	..	..	..	..	..	..	..	..	..	
Nov. 12, 1948	1·86	29	..	..	..	..	22	2	..	8	1	13	17	7	..	..	..	
Nov. 19, 1948	2·88	31	..	5300	..	..	15	2	..	2	5	16	49	11	..	..	..	
Nov. 29, 1948	2·25	47	1·02	15,400	..	..	28	..	..	..	..	11	54	4	..	..	..	
Dec. 6, 1948	1·87	23	0·6	10,200	..	..	10	1	..	15	..	38	29	7	..	..	..	
Dec. 31, 1948	2·13	47	1·01	9000	..	..	..	..	..	..	..	..	..	..	..	..	..	
Jan. 7, 1949	2·57	49	..	..	..	..	11	1	..	1	..	27	50	10	..	..	..	
Jan. 27, 1949	1·16	18	..	..	..	..												

* Basophils nil in all counts. † Per 100 white cells.



—Right femur, radiographed after death, showing generalised ease in density, with almost complete obliteration of the lullary cavity in upper half.

ow cells were rather more numerous than before. There very few recognisable erythroid cells. The characteristic vas thought to be a hæmocytoblast; several of these were found in division, one showing four nuclei. There a hiatus between these cells and a few myelocytes and myelocytes. There were, however, some small round resembling lymphocytes, which may have been myelo-s.

atment with blood-transfusions was started on May 10. one two-pint transfusion there was some improvement. May 22 hæmoglobin had gone up to 54% and the red-cell t was 4,800,000 per c.mm. Further blood-transfusions two pints on June 2 led to a hæmoglobin reading of 71%, this had dropped to 50% on June 10, and further blood-fusions of two pints each on June 16, July 7, and July 18, three pints on July 31 led to no material improvement. last blood-count, on Sept. 1, showed Hb 21% and cells 1,120,000 per c.mm.

ogress.—Throughout the illness limb pains and inter-ent swelling of joints were prominent, and pain was etimes so severe as to require morphine. There was ressive emaciation, and the patient lost several stones in ht. Her temperature towards the end showed irregular to 103° but there were periods of upwards of a week when as normal. She died on Oct. 3, 1947.

NECROPSY FINDINGS

he body was that of an emaciated girl whose skin showed ead white pallor. There were no bruises or petechiæ. lost all the superficial fat had disappeared. The joints wed no abnormalities. Axillary and inguinal lymph-glands e palpable. Mediastinal glands were slightly enlarged, h superficial hæmorrhages. Mesenteric glands were rged, flat, and whitish. Para-aortic glands showed small erficial hæmorrhages. Sections from several glands all wed loss of normal architecture, and some showed coarse nds of fibrous tissue, only small fragments of lymph icles remaining. Silver impregnation showed a rather rse reticulum with few cells in the interstices. Megakaryo-es appeared in a few of the glands in small clusters. Red-precursors were scanty, and the predominant cell was of cular type with a large irregular vesicular nucleus.

he *lungs* were pale, with numerous small bright-red norrhages on the surface. There was no evidence of erculous infection. The *cardiovascular system* showed no croscopic abnormality, except that the diameter of the ta was significantly reduced.

The *liver* was not enlarged and was pale pinkish-brown with merous opaque miliary nodules giving a fine cream mottling oughout its substances. Microscopically there was a fine rosis in the portal areas with deposition of pigment in the er cells, most marked in the periphery of the lobules. the periportal areas there were infiltrations of cells, some n being of considerable size; myeloid cells were also ttered through the liver sinusoids. Erythroid precursors re numerous, and a few megakaryocytes were seen. One ction showed a tiny metastatic bone-marrow nodule, mewhat necrotic but with numerous megakaryocytes; it as reminiscent of the large tumour found in the spleen the case of megakaryocytic myelosis described by Hewer 937).

The *spleen* weighed 16 oz.; its capsule was smooth and thin, ith a fine white mottling over the surface. On section it as deep red studded with brighter red glistening pinpoint odules. There were no infarcts. Histologically the spleen howed a loss of normal architecture with little obvious ibrosis, though silver impregnation showed an increase of somewhat coarse reticulum. There were many primitive narrow cells lying in the sinuses and in the pulp. Erythroid precursors were scattered, throughout the spleen, though very few islands of young red cells were found; there were a few megakaryocytes but they did not form a prominent part of the picture. Many eosinophils, both polymorphs and myelocytes, were seen, though there had never been an eosinophilia in the peripheral blood.

The *kidneys* were pale but showed no gross changes. Sections showed most extensive infiltration with hæmopoietic cells; these cells formed foci which were destroying the tubules by crowding them out of existence. The histological picture was that of a diffuse extramedullary hæmopoiesis.

Bones.—The sternum showed thinning of the corticalis, with obliteration of the marrow cavity by spongy bone; a few fragments of red marrow were seen in the manubrium only. Two ribs examined showed an increase of bony trabeculæ, but there was rather more marrow in the interstices than in the sternum. Lumbar vertebræ showed increased spongiosa, but a considerable amount of marrow remained. In one vertebra there was a dense wedge-shaped infarct. The femur was a light bone and showed no external abnormalities. Longitudinal section showed thinning of the cortex in the upper and lower third of the bone, with some irregular increase of its density in the middle third. In the upper third the spongiosa showed increased trabeculation, with very little marrow. Irregular spicules of bone projected into the cavity of the shaft, which was much reduced and contained some yellow marrow, with a few flecks of red marrow at intervals. In the lower third of the bone the spongiosa became increasingly dense (fig. 3*b*). There was an infarct in one condyle. The marrow (fig. 1) in sections showed few cells; young fibrous tissue was growing out from the trabeculæ, and silver staining demonstrated a fine reticulum. There was no osteoblastic reaction.

The peripheral blood picture in this case was not truly leukæmic, the first count showing only 8% myelocytes. Two months later 7% myeloblasts were found and a few normoblasts were recorded for the first time. The picture was that of a leuco-erythroblastic anæmia; the characteristic cell in the bone-marrow was a hæmocytoblast, and there were few intermediate forms between these cells and the polymorphs. Towards the end the number of nucleated red cells increased and finally reached 64,000 per c.mm.

SECOND CASE

The second case was accepted clinically as a case of acute leukæmia, but in view of Churg and Wachstein's (1944) contention that osteosclerosis is associated with non-leukæmic myelosis and rarely, if ever, with a true leukæmia we decided to look for bony involvement in all available cases showing a leukæmic or leukæmoid blood picture.

Sternal puncture proved difficult owing to the density of the sternum, and only a small clot was found in the needle, but this contained marrow cells. Examination showed that 47% of these were of the granular series, 31% were small round cells, and 22% were of the erythroid series. Even if the small round cells are all assumed to be micromyeloblasts, the M/E ratio is low for a leukæmia. Unfortunately very little necropsy material was kept, since the findings were thought at the time to be those of a typical leukæmia and to have disproved the theory that osteosclerosis did not occur in these cases. Since that time 4 cases of acute myeloid leukæmia have been carefully investigated, and none of these showed myelosclerosis; 2 other cases have been presumed to have no bony involvement because there was no clinical evidence of it.

A man aged 32, an upholsterer, was admitted on Oct. 21, 1947. He had been feeling run down for three months and had lost weight. Six weeks before admission he had had four teeth removed for pyorrhœa; the sockets bled for three days, and he was notably pale but went back to work. Five days after the extractions he had had an attack of acute spasmodic epigastric pain, which again kept him from work and kept recurring. A week before admission he had had three more teeth extracted, with a recurrence of bleeding, which again lasted three days and was followed by pain in the right knee, which sent him to bed. The knee had become swollen, and the pain had radiated up and down the leg. There was no significant past or family history.

On examination he was pale and his right knee was slightly tender but not swollen. There was slight limitation of flexion. His temperature was 99·6°F, but in the following three weeks it rose to 100–102°F in the evenings. The gums were hypertrophied and oozing blood. There were petechiæ on the hard palate. The liver and spleen could not be felt, and there were no palpable glands.

Radiography of pelvis and long bones showed some generalised increase in density, with patchy opacity at the base of the great trochanter, in the right femur, and some increase in density of the pelvic bones.

Treatment with urethrane, gr. 30 thrice daily, was begun on Oct. 25 and continued until Nov. 11. A blood-transfusion of two pints was given on Oct. 24.

Progress.—On Nov. 11 he complained of pain in the splenic region, and his spleen was now found to be palpable. His condition had gradually deteriorated, and he died next day.

Radiography of right femur after death showed that the head was extremely dense. The neck, greater trochanter, and most of the upper half of the shaft showed a less homogenous increase in density, and the inner margins of the cortex, especially in the middle third of the shaft, were not really distinguishable. The cortex showed small rather linear translucent areas, and the medullary cavity appeared to be almost obliterated by coarse bony trabeculæ.

NECROPSY FINDINGS

The body was that of a well-nourished man; there were no external hæmorrhages and the glands were only slightly enlarged. There were no significant findings in the thorax. The abdomen contained half a pint of unclotted blood. There were large clots of blood round the *spleen*, which was soft and deep pink but not much enlarged. There were one or two rents in the capsule, from which there had been some bleeding. The capsule stripped off carrying with it a double layer of organising blood-clot, suggesting that hæmorrhages had been occurring for two or three weeks. The cut surface showed no infarcts or significant alteration in pattern. Microscopically the spleen was very similar to that seen in case 1, except that there were irregular eosinophilic masses of necrotic cells. There was diffuse extramedullary hæmopoiesis, with no great increase of myeloblasts.

The *liver* showed an entirely different picture. Here there was no extensive infiltration and no evidence of extramedullary hæmopoiesis. There was scanty periportal infiltration with primitive myeloid cells, but this did not appear comparable with the high count of primitive cells in the peripheral blood.

Bones.—The sternum showed thinning of the cortex, with increased density of the spongiosa and only a few flecks of marrow in the fine trabeculæ. The femur was massive and felt heavy in comparison with other femora examined. There was a little pinkish marrow in the upper third but it was difficult to scrape away from the bone. The spongiosa was greatly increased in density and seemed to be developing at the expense of the corticalis. In the middle third there was some increase of density in the corticalis, which on the inner side showed definite thickening, and the medullary cavity here contained some marrow. Below this the spongiosa increased and appeared to be invading the cortex. In the lower third the cortex was reduced almost to eggshell thickness and the spongiosa became very dense, with the result that to the naked eye the trabecular pattern had almost disappeared (fig. 3*a*), there was no demonstrable marrow (fig. 2), and the section of the bone was cream-coloured.

In this case therefore the femur differed considerably from that of the first patient, in that the trabecular pattern was much denser and in the lower third presented a dense homogeneous picture. It seems certain that the bony changes must have been initiated some time before the leukæmoid blood picture developed. Follis et al. (1942) suggest that in the marrow osteosclerosis occurs first, followed by leukæmic or erythroblastic proliferation. This in turn is followed by disappearance of the leukæmic and erythroblastic cells (depopulation of the marrow) and proliferation of fibrous tissue in their place; finally osteosclerosis develops in the area.

It is likely that the extramedullary found in these cases is a response to an excessive on the bone-marrow, which was gradually obliterated by fibrosis and overgrowth of spongy Histologically both cases showed an irregular with marrow cells rather than a diffuse leukæmic of the spleen and glands. The late enlargement spleen in both cases suggests that it occurred as a pensatory process following the obliteration of marrow cavity.

THIRD CASE

The third case presented as an aplastic *After a long period of hypoplasia of the bone-* there were diminishing response to blood-tr and compensatory splenic enlargement.

A boy aged $2^{1}/_{2}$ years, was admitted on Nov. 5, 19 He was the only child of normal parents; his mother had no miscarriages. He had weighed $8^{1}/_{2}$ lb. at birth. T months before admission he had had skin sepsis, with "b and abscesses" in both legs and groins. A month bef admission his nose had bled severely for twelve hours. Fr this time onward increasing pallor was noted; he looked and had a cough. He vomited often and developed a dis from his ears, and loose slimy motions.

On examination he was very anæmic, with moderate wasting and much halitosis. Some small shotty glands were palpable in the neck, axillæ, and groins. The spleen was palpable 2 in. below the costal margin. The mouth and throat wa clean. The left ear drum was perforated and discharg intermittently.

Progress.—During the next few weeks the child suffered considerably from skin sepsis, at first on the lower limbs a later on the face. This was associated with considerable enlargement of groin and cervical glands. His temperature swung irregularly to 102°F. About the end of January h passed four roundworms.

Treatment.—Nine blood-transfusions were given, who blood being used in the early stages, and packed cells late Clinical improvement was definite, but hæmoglobin never ro above 55%. The spleen became much larger about th middle of February; the liver also was palpable at this stage He developed a bronchopneumonia, which did not respond t penicillin, and he died on March 1, 1949.

NECROPSY FINDINGS

Macroscopic changes in the organs were not significant The *spleen* was enlarged, weighed 15 oz., and was deep re and homogeneous in appearance. The *liver* and other organs were pale. There was slight generalised enlargement o *lymph-glands.* The *thymus* was not enlarged. The *thyro gland* was enlarged and showed no obvious colloid.

Sclerotic changes were marked in the *bones.* The marrow cavity of the sternum was filled with dense spongiosa with th *result that no marrow was obtained.* The femur was norma externally and was $7^{1}/_{2}$ in. long. Longitudinal section showe much sclerosis of the head, the density approaching that o a marble bone; the trabeculation became coarser toward the shaft, and in the middle third of the shaft the cavity remained and contained reddish marrow for about 1 in. Below this the trabeculation increased again; it was coarse at first and there was a little marrow in the interstices, but it became increasingly dense in the lower third and seemed to b developing at the expense of the cortex.

Histologically there were no significant findings in the tw glands examined. The thyroid gland showed great hypertroph of the acini, with very little secretion. The *lungs* showed terminal bronchopneumonia only. The *spleen* showed som loss of the normal architecture; red cells were generall scanty, but primitive cells with large, sometimes enormou vesicular nuclei and generally one or two nucleoli wer scattered throughout the section; a few mitotic figures wer seen; and there were groups of eosinophils, both polymorph and myelocytes. Recognisable red-cell precursors were ver scanty. The *liver* showed more definite foci of hæmopoiesis the cells showed some degeneration, but the same primitiv cell was prominent. An occasional megakaryocyte was found

dneys showed no cellular infiltration. The marrow
d from the femur was cellular and consisted chiefly
undifferentiated cells, but eosinophils were a notable
a few nucleated red cells were seen.

istological appearances in this case differed from
the other two in that extramedullary hæmo-
was less prominent and red-cell precursors were
nty. The possibility that this was an aleukæmic
ia has been considered, but the resemblance to
ings in cases 1 and 2 suggests that they should all
sed as myelosclerosis. Case 3 seems to have
s a result of a long-standing refractory anæmia,
starting soon after birth. Rosenthal and Erf
have described similar cases in children. Radio-
finding of myelosclerosis has also been noted by
lz and Foster (1947) in a girl, aged 9 years, with
s anæmia and malaria: the condition here
own to exist for eight years. Follis et al. (1942).
ng well-marked myelosclerotic changes in 5 cases
throblastosis fœtalis, suggest, on the known
in birds between œstrogenic hormone and bone
, that myelosclerosis in these cases may have been
increased chorionic hormone from enlarged
æ. Though Rh incompatibility has been excluded
3, it seems possible from the presence of thyroid
s that an endocrine factor may have been
d.

early appearance of bony changes has been an
ding feature of some cases and suggests that radio-
evidence would be forthcoming if it were looked
he bones most constantly involved are the long
particularly femur, humerus, and tibia, but
s in ribs and skull have also been noted. The total
of the bone is not affected; the inner margin of
tex of the long bones becomes ill defined. The cortex
ow small translucent areas, and the medullary cavity
e almost obliterated by coarse bony trabeculæ
s. 2, 3*a*, and 3*b* and compare with fig. 3*c* from a
acute myeloid leukæmia). The later stage shows a
lised increase in density, with medullary cavity no
distinguishable. In long-standing cases periosteal
ay be formed. In the pelvis the changes are usually
arked in those parts adjacent to the acetabulum
ng 1937). In the skull the frontal bone seems to be
ommonly affected.

iological evidence of bony changes may be found
n acute or subacute cases. They may be present
in the illness or may be seen only just before
They are to be sought particularly in those
in which pain has been a prominent feature, and
most painful areas. Where pain is absent, routine
ation of the upper half of both femora and of the
us, tibia, lumbar vertebræ, and skull should be
l out. Bone-marrow biopsy may be needed to
ete the diagnosis when radiography is negative.

CONCLUSION

elosclerosis as a clinical entity is probably commoner
has been thought. It has long been recognised in
ation with leukæmoid and leuco-erythroblastic
states. In the chronic case splenic enlargement is
well marked. Such cases may be mistaken for
emic leukæmia or splenic anæmia.

more acute cases and in refractory anæmia due to
ing or exhaustion of the bone-marrow its presence
d be considered when limb pains or backache are
minent feature. Long-continued pyrexia associated
a severe anæmia should also bring this possibility
ind. From the cases here presented it seems that
dinal indication of the diagnosis is the finding of
derable difficulty in obtaining bone-marrow by
al puncture. Instead of the usual sharp penetration there is diffuse resistance, and there is no way of knowing when the marrow cavity has been reached.

Splenic enlargement in these acute and subacute cases is variable, but the association of an enlarged spleen with a hypoplastic marrow is sometimes suggestive. So also is the waning effect of repeated blood-transfusions.

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STREPTOMYCIN IN FRIEDLÄNDER PNEUMONIA

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With illustrations on plate

Infection of the lung with the Friedländer bacillus is rare: it has been variously estimated as the cause of between 0·5% and 4·0% of all cases of pneumonia reaching hospital. Since almost all patients with Friedlander pneumonia are seriously ill, most of them tend to reach hospital, and the total percentage incidence is probably lower than reported. Acute and chronic forms are described, but the chronic is usually the result of the acute. The Friedländer bacillus is also found in some cases of bronchiectasis; its significance then is doubtful, since usually it is only one of several organisms found in the sputum.

Acute primary Friedländer pneumonia is of acute onset and occurs mainly in men aged 40–60, especially those who are debilitated. Cases in women and in other age-groups are, however, not uncommon. The body temperature is relatively low compared with other forms of pneumonia. There is often a well-marked leucopenia. The sputum in most cases is characteristic, being very tenacious and stringy and of a chocolate colour, often mixed with pure blood. Unless the patient dies early from the toxæmia, there is a tendency to cavitation of the lung. The disease is progressive, and until recently the case-mortality, in spite of treatment, was very high.

MORTALITY-RATES

Series published have on the whole been small, with a mortality-rate of 70–97%. The largest series published is that of Zander (1919), who described an epidemic of 411 cases with a mortality-rate of 30%. His patients were mostly young. Since he gave no clinical details and all other series published before 1943 showed a much higher mortality, judgment on this article must be reserved, especially as the disease he described does not fit in with the usual picture of Friedländer pneumonia. Hyde and Hyde (1943) published 51 cases with a mortality-rate of 50%. They attributed their success to treatment with sulphonamide drugs and claimed that such treatment given early reduced the mortality-rate to 13%. Perlman and Bullowa (1941), who also used sulpha-drugs, had a mortality-rate of 84% in 37 cases.

Mortality-rates published before 1945 are as follows:

Reference	*No. of cases*	*Mortality-rate*
Zander (1919)	411 ..	30%
Cole (1928)	7 ..	71%
Bhatnagar and Singh (1935) ..	13 ..	92%
Solomon (1937)	32 ..	97%
Bullowa (1937)	30 ..	82%
Bullowa et al. (1937)	11 ..	83%
Perlman and Bullowa (1941) ..	37 ..	81%
Hyde and Hyde (1943)	51 ..	50%

STREPTOMYCIN

Experimental work by Heilman (1945) suggested that Friedländer pneumonia ought to respond to streptomycin. However, only a few cases thus treated have been published. Herrell and Nichols (1945) mention 2 cases of the bronchiectatic type treated successfully. Bishop and Rasmussen (1946) successfully treated an acute case after treatment with sulphadiazine and penicillin had failed. The National Research Council (1946), reporting on 17 cases treated with streptomycin, stated that "6 recovered permanently, 3 improved permanently, 3 improved temporarily, 3 showed no effect, and 1 died." This only adds up to 16 cases and no clinical details were given. Finland et al. (1946) published a case of bronchiectasis in which the Friedländer bacillus predominated in the sputum and disappeared under streptomycin therapy. Learner and Minnich (1946) and Keating (1948) each successfully treated 1 acute case with streptomycin. Harris et al. (1947) report 2 acute cases and 1 chronic case; in 1 of the acute cases the patient died soon after admission, but the 2 other patients recovered. Learner and Minnich's (1946) case had been treated with penicillin for six days before streptomycin was given. In the few cases in which penicillin was primarily used, it had little effect, except in 1 case reported by Kobacker and Mehlin (1945), who claimed a cure with penicillin. The streptomycin dosage in the various cases reported was 2–6 g. daily.

The following is a further case of acute Friedländer pneumonia treated with streptomycin.

A male chemical worker, aged 54, was admitted to the General Hospital, Nottingham, on March 6, 1949, with pneumonia. For some years he had had a cough and occasional mucoid sputum, which were worse in winter. Because of this he had been radiographed in January, 1949, but no abnormality was seen. Fourteen days before admission his cough and sputum had increased. Seven days before admission he had begun to feel ill, his sputum had become brown, and he had taken to his bed. He had since deteriorated, but had not had any pain. He had been troubled by dyspnœa for four days. He denied taking alcohol in excess.

On admission he was extremely ill with cyanosis, respiration 28 per min., temperature 100·4°F, and pulse-rate 108. His sputum was very viscid, stringy, and chocolate-coloured but not offensive. The only significant findings were in the chest. There was very little movement of the left hemithorax, and dullness was well-marked over the upper lobe, with bronchial breathing, whispering pectoriloquy, and some râles and crepitations. There were numerous adventitious sounds over the left lower lobe, and to a lesser degree over the whole of the right lung.

Treatment.—The patient was given continuous oxygen and was started on penicillin units 100,000 and sulphathiazole 1 g. three-hourly.

Investigations.—A white-cell count gave 11,200 per c.mm., with a normal differential count. His hæmoglobin was 84% (Haldane). The first specimen of sputum was unsatisfactory and showed a mixed flora. A further specimen taken the same day showed nearly all the organisms to be gram-negative capsulated rods, which on culture proved to be Friedländer bacilli. Other organisms were scanty and mainly pneumococci. The Friedländer bacilli were not typed. No blood-culture was taken. Radiography on the day after admission showed consolidation and early cavitation of the left upper lobe, with patchy consolidation in the remaining parts of the lungs (fig. 1).

Progress.—During the first few days in hospital the patient improved, but his sputum increased. He then started to deteriorate. Radiography on March 15 showed the pneum to have advanced, with multiple cavity formation in the lung and mediastinal shift to the right. On the same a white-c [illegible] .mm., but the differ count rer [illegible] hiazole was discontin in view of this count, and, in spite of the fact that sensitiv tests showed the Friedländer bacillus to be resistant penicillin, penicillin was increased to 1,000,000 units thre hourly. At this time the patient's temperature varied betw 99·6°F and 101°F; his pulse-rate was about 106, and resp tions constantly about 28 per min. On March 23 he coll and brought up considerable amounts of sputum contain much fresh blood. He remained in a very critical state for days and then improved slightly. Radiography on March showed a very large cavity in the left upper lobe and a sm cavity in the apex of the left lower lobe (fig. 2). The co solidation on the right side had resolved. A white cell co at this time gave 7600 per c.mm., with a normal differ count. He continued to lose an appreciable amount of bl in the sputum, and on April 3 his Hb was 40% (Hald He was given the cells from four pints of blood and one p of fresh blood (group A Rh-positive) in two days. Th raised the Hb to 70%. The white-cell count remained same.

Streptomycin Treatment.—On April 11 streptomycin bec available, and the Friedländer bacilli were shown to moderately sensitive to it. At this time the patient deteriorating slowly, losing weight, and very toxic. Postu drainage had had to be abandoned soon after being attempted The sputum continually grew almost pure cultures of Fried länder bacilli. The penicillin was discontinued, and a cour was started of streptomycin 1 g. twelve-hourly and sulph diazine 1 g. four-hourly. Within a few days the sputum bec free from blood and lost its chocolate colour, and the pati ceased to be toxic, and started to feel better. Within fe days it was possible to start postural drainage again, with goo effect. He started to put on flesh, and on April 16 a white-ce count gave 15,000 per c.mm., the highest since admission. Th improvement in Hb was maintained. Pulse-rate, respiration rate, and temperature became normal. To aid the drainage of the cavities he was bronchoscoped on April 22 (Mr. W. Buckley and Mr. E. J. G. Glass). Apart from injection of th left bronchial tree and pus in the main bronchi nothing of significance was seen. Serial radiography showed gradu diminution of the cavities, and on May 7 chemotherapy wa stopped, because the cavities contained no fluid (fig. 3 As long as the cavities contained fluid, Friendländer bacil persisted in the sputum, but pneumococci and *N. catarrhali* appeared in the sputum at the beginning of May. Furthe serial X-ray films showed the cavities becoming still smaller with mediastinal shift to the left. A film on July 7 showe residual damage in the left upper lobe. Clinical examinatio revealed very few crepitations and râles in the left upper zone with tracheal and mediastinal shift to the left. The scanty sputum contained mainly *N. catarrhalis.*

The present case was one of acute Friedländer pneu monia proceeding to cavitation. It was a typical cas

Streptomycin only became available after the diseas had been progressive for seven weeks, and it was for thi reason that alternative chemotherapy was first tried During this time the consolidation in the right lun resolved, while the lesion in the left lung progressed The lesions in the right lung were earlier lesions, and i this connexion the reports of Hyde and Hyde (1943 and Kobacker and Mehlin (1945) are of interest Possibly the patient might have survived without th help of streptomycin, but the clinical effect was dramati and altered the whole course of the pneumonia. O interest is the clearing of the leucopenia soon afte streptomycin therapy was started.

SUMMARY

A typical case of primary Friedländer pneumonia refractory to penicillin and sulphonamide, responde dramatically to streptomycin.

I wish to thank Dr. W. S. Whimster, under whose car this case was, for the help and encouragement he ha given me.

References at foot of next page

HISTAMINE METABOLISM IN PREGNANCY*

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to 1935 many contradictory reports were published the presence of histamine in normal human . In that year, however, Barsoum and Gaddum) described a reliable micro-method, which has lished that histamine is a normal constituent of . The blood-histamine level in human pregnancy een investigated by Revoltella (1930), Marcou and nasiu-Vergu (1937), Giudici (1937), Effkemann and e (1940), and Cusmano (1941), but their results d considerably.

rcou et al. (1938) were the first to report that the l of pregnant women was highly histaminolytic. finding has been confirmed by Werle and Effkemann)), Zeller et al. (1941a), Ahlmark (1944), Kapeller-r (1944), Koloszynski (1945), and Anrep et al. 7a and b). It has been emphasised that this hista-se activity in the blood is characteristic only of an pregnancy and is not met with in any other condi- (Werle and Effkemann 1940, Zeller et al. 1941a). reas Ahlmark (1944) observed an increase in the minolytic power of the blood in most of the pregnant als which he studied, Werle and Effkemann (1942) and p et al. (1947a) did not find any significant change in blood-histaminase level of pregnant animals compared non-pregnant ones.

TABLE I—FINDINGS IN NON-PREGNANT WOMEN

ase no.	Serum-histaminase	Histamine (µg. per litre of blood)	
		In blood-cells	In plasma
1	0	20	0
2	0	20	0
3	0	25	Trace*
4	0	40	Trace
5	0	30	10
6	0	35	0
7	0	35	15
8	0	55	0
Mean	..	32·5±4·1 (S.E.)	.

* Amounts below 10 µg. per litre of blood.

n the work reported here estimations of the histamine tent and tests for histaminase activity were made ultaneously on the blood and serum of 121 women with mal and toxæmic pregnancy in various stages of tation. Since the results suggested that in some ditions of pregnancy histamine might shift from the cells into the tissue fluids, it was decided to estimate separately the histamine content in the plasma and in the blood-cells of women with normal and toxæmic pregnancy.

METHODS

Simultaneous Estimations of Histamine in Plasma and Blood-cells.—10 ml. of citrated blood was centrifuged at 3000 r.p.m. for fifteen minutes. Only specimens completely free from hæmolysis were tested. The plasma was very carefully separated from the blood-cells, and the histamine content of both plasma and blood-cells was separately determined by Code's (1937) modification of the biological method of Barsoum and Gaddum (1935). In every case histamine was identified by tests with the anti-histamine drug 'Neoantergan' by the quantitative method described by Reuse (1948). The results were expressed as microgrammes of histamine per litre of blood.

TABLE II—FINDINGS IN NORMAL PREGNANCY

Case no	Weeks of gestation	Serum-histaminase	Histamine (µg. per litre of blood)	
			In blood-cells	In plasma
9	14	± to +	45	Trace
10	14	±	45	Trace
11	15	± to +	30	10
12	17	++	45	15
13	18	± to +	35	Trace
14	18	++	40	10
15	20	+	25	Trace
16	20	+ to ++	30	40
17	20	++	20	Trace
18	21	+	15	Trace
19	21	+	30	Trace
20	22	+	30	10
21	23	++ to +++	30	10
22	24	++	60	Trace
23	26	++ to +++	60	15
24	30	+++	18	Trace
25	31	++	65	Trace
26	32	+++	60	Trace
27	32	++	15	Trace
28	35	+++	30	Trace
29	35	+++	50	Trace
30	38	++	50	Trace
31	38	++	50	Trace
32	39	++	40	Trace
33	40	+ to ++	25	Trace
Mean	..	..	36·3±3·06	..

Test for Serum-histaminase.—A modification of the colorimetric indigo-disulphonate method of Zeller et al. (1941b) was used.

Add to 1 ml. of serum 2·5 ml. of $M/15$ phosphate buffer (Sörensen) with pH 7·2, 0·1 ml. of a histamine solution in $M/15$ phosphate buffer containing 1 mg. of histamine hydrochloride, 0·4 ml. of a solution of 20 mg. of indigo disulphonate in 30 ml. $M/15$ phosphate buffer, and one drop of N-octyl-alcohol. Shake well and pass oxygen through the solution for one minute. Close the test-tube with a rubber stopper and incubate for twenty-four hours at 37°C.

Each serum is tested in triplicate, and a control estimation is always done without histamine. After incubation the initial blue colour of the control usually does not change.

The histaminase activity of the serum is estimated from the colour, +++ indicating that decoloration is complete, ++ distinct, + weak, ± very faint, and 0 absent.

RESULTS

The results obtained in 91 pregnant women in various stages and conditions of pregnancy and 8 non-pregnant women are shown in tables I–VIII.

In the 8 *non-pregnant women* (table I) no histaminase was detected in the serum. No histamine was found in the plasma, except for small amounts in 4 cases.

In 25 cases of *normal pregnancy* (table II) the highest serum-histaminase levels were found between the seventh and eighth months. In only 7 cases was hista-

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TABLE III—FINDINGS IN MILD PRE-ECLAMPTIC TOXÆMIA

Case no.	Weeks of gestation	Serum-histaminase	Histamine (µg. per litre of blood)	
			In blood-cells	In plasma
31	12	±	35	10
35	26	+ +	20	Trace
36	27	+ to + +	35	15
37	31	+ +	30	Trace
38	35	+ + to + + +	45	Trace
39	35	+ to + +	30	20
40	38	+ +	30	Trace
41	38	+ +	60	20
42	38	+ + to + + +	60	10
43	39	+ +	70	20
44	39	+ +	20	30
45	39	+ +	40	25
46	40	+ +	35	70
47	40	+	20	15
48	40	± to +	100	20
49	40	± to +	20	20
Mean	..	..	*40·6 ±5·5*	..

mine found in the plasma in small amounts. Marcou and Athanasiu-Vergu (1937) also obtained only a trace of histamine in the plasma of pregnant women.

Of 16 cases of *mild pre-eclamptic toxæmia* (table III) a few showed a slightly diminished enzymic activity. In many, however, higher plasma-histamine levels were found than in normal pregnancy. Measurable amounts of histamine were present in the plasma in 12 of these 16 cases. This number is significantly greater than the number for normal pregnancy ($P < 0{\cdot}01$). The mean cell-histamine level did not significantly differ from that of normal pregnancy.

The activity of serum-histaminase was distinctly decreased in the 16 cases of moderate or severe *pre-eclamptic toxæmia* (table IV). In all these cases measurable amounts of histamine were present in the plasma. There can be no doubt ($P < 0{\cdot}001$) that this result shows that measurable amounts of histamine were found in the plasma with significantly greater frequency among these cases than in normal pregnancy. The histamine content of the blood-cells was remarkably low in all cases but 1, and the mean value was significantly lower than in normal pregnancy ($P < 0{\cdot}01$). In many cases the histamine content of the plasma exceeded that of the blood-cells. Case 60, with a very high plasma-histamine level and an exceedingly low blood-cell histamine level, had extremely severe pre-eclamptic toxæmia.

All but 3 of the 15 women in various stages of *labour* (table V) showed a rise in the plasma-histamine compared with normal pregnant women before term. 12 women had measurable amounts of histamine in their plasma. This number of cases is significantly greater than the result for normal pregnancy ($P < 0{\cdot}02$). In some cases the plasma-histamine was higher than the blood-cell histamine. Case 77 was a woman with pre-eclamptic toxæmia in the second stage of labour, and case 77a was the same woman in the third stage, when histamine had almost completely disappeared from the blood-cells and only little histamine was detectable in the plasma. Marcou and Athanasiu-Vergu (1937) also found a raised plasma-histamine during labour.

TABLE IV—FINDINGS IN MODERATE AND SEVERE PRE-ECLAMPTIC TOXÆMIA

Case no.	Weeks of gestation	Serum-histaminase	Histamine (µg. per litre of blood)	
			In blood-cells	In plasma
50	26	± to +	15	10
51	28	+	25	25
52	29	+ to + +	20	30
53	29	±	75	20
54	34	±	10	10
55	36	±	Trace	15
56	36	+ to + +	20	40
57	36	±	15	10
58	37	± to +	22	25
59	37	+ to + +	15	15
60	37	+	6	120
61	37	± to +	40	35
62	38	+ to + +	15	10
63	38	+ to + +	20	10
64	39	+	22	30
65	43	+ to + +	15	10
Mean	..	..	20·9 ±4·2	..

As regards histaminase, 4 of 15 women showed normal activity in the serum, whereas in the rest the serum-histaminase level had more or less fallen. Cases [illegible] and 76, with a high histaminase activity, were both cases of toxæmic pregnancy in the first stage of labour with very protracted primary uterine inertia.

Only a faint histaminase activity was detected in the sera of 3 out of 9 *puerperal patients* (table VI). The plasma of these women generally did not contain any detectable histamine. The 3 women whose plasma contained histamine were case 81, an eclamptic women who delivered herself of a thirty weeks' fœtus, case 82, who had mild toxæmic pregnancy, and case 85, who had severe toxæmia of pregnancy after a twin pregnancy and stillbirths. Case 84 was delivered of a baby with acute icterus neonatorum.

A definite rise in the plasma-histamine level in 4 out of 5 cases of *pyelitis of pregnancy* (table VII) suggests a toxæmic origin of this condition in pregnancy. No spectacular change was seen in the activity of serum-histaminase as compared with that in normal pregnancy.

Cases 95–98 (table VIII) were threatened abortions. Histaminase activity was hardly detectable in the serum. Of the 4 cases, 3 showed considerable amounts of histamine in the plasma. Case 99, antepartum hæmorrhage, showed normal histaminase activity but a raised plasma-histamine level.

TABLE V—FINDINGS DURING LABOUR

Case no.	Serum-histaminase	Histamine (µg. per litre of blood)	
		In blood-cells	In plasma
66	+	15	40
67	+ +	100	Trace
68	+ +	10	75
69	+ + +	30	23
70	+ +	35	Trace
71	+ + +	20	15
72	+ to + +	20	15
73	+ + to + + +	45	25
74	+ + +	80	35
75	+ +	40	25
76	+ + +	45	65
77	+	15	20
77a	+	Trace	10
78	+ +	20	10
79	+ to + +	25	Trace
80	+	15	20
Mean	..	32·2 ±6·5	..

DISCUSSION

The considerable increase of plasma-histamine in toxæmic pregnancy and in labour can be explained on the hypothesis that the histamine metabolism in pregnancy differs from that in non-pregnant women in that, in pregnancy, histamine can easily shift from the cells into the tissue fluids. This suggestion seems to be borne out by the increase in serum-histaminase prevailing throughout normal pregnancy. This significant increase may be regarded as a protection against potential intoxication with histamine. In severe cases of toxæmic pregnancy a highly decreased or completely absent activity of the serum-histaminase seems to be always associated with a comparatively low histamine content of the blood-cells and a somewhat higher plasma-histamine. Perhaps in these circumstances histamine, not metabolised by histaminase, is extravasated into the surrounding tissue and thus begins to exert its toxic ts. The observation that in labour the plasma ains considerable amounts of histamine suggests histamine may play a part during parturition.

ne observation that in a few cases of threatened tion histamine was present in the plasma and uminase was hardly detectable in the serum may also ignificant.

nce it is generally accepted that histaminase is luced in the placenta (Danforth and Gosham 1937. con et al. 1938. Zeller et al. 1939, Ahlmark 1944, eller-Adler 1944. Swanberg 1948), any degenerative nges in the placenta may be responsible for a inished or absent activity of the serum-histaminase regnancy.

erhaps the increase of histamine in pregnancy is to the peculiar histidine metabolism prevailing uring gestation. Histamine might be formed in pregancy from histidine through the activity of the enzyme stidine decarboxylase. whose occurrence in man, wever. still remains to be proved.

TABLE VI—FINDINGS IN THE PUERPERIUM

se o.	Serum-histaminase	Histamine (µg. per litre of blood)		Day of puerperium
		In blood-cells	In plasma	
81	±	25	15	1
82	0	25	20	4
83	0	40	Trace	5
84	0	120	0	5
85	±	60	50	6
86	0	20	0	6
87	±	70	0	8
88	0	10	Trace	8
89	0	20	Trace	10
ean	..	43·3 ±11·5	..	..

SUMMARY

The histamine content was separately estimated in the lasma and in the blood-cells of pregnant women in arious stages and conditions of pregnancy. Histaminase tivity was simultaneously determined in the serum of ese women by a modification of the indigo-disulphonate action of Zeller et al. (1941b).

Strong histaminase activity was found in the serum f all the pregnant women. Histamine was present in he blood-cells in amounts comparable with those found the blood of non-pregnant women. It was hardly etectable in the plasma.

In mild toxæmia of pregnancy the histaminase activity id not differ much from that in normal pregnancy. Higher values. however, than in normal pregnancy were btained for plasma-histamine. In severe toxæmia f pregnancy the histaminase activity was distinctly ecreased. The histamine level in the blood-cells was emarkably low, being in many cases exceeded by the level n the plasma, which was high.

Considerable amounts of histamine were found in the lasma of women in labour. Histaminase activity seemed to decline in the later stages of labour.

TABLE VII—FINDINGS IN PYELITIS OF PREGNANCY

Case no.	Weeks of gestation	Serum-histaminase	Histamine (µg. per litre of blood)	
			In blood-cells	In plasma
90	33	− −	Trace	45
91	35	− −	50	140
92	38	− −	65	50
93	38	− −	70	60
94	40	− ± to − − −	20	Trace
Mean	..	..	41 ± 13·4	..

TABLE VIII—FINDINGS IN THREATENED ABORTION AND ANTEPARTUM HÆMORRHAGE

Case no.	Weeks of gestation	Serum-histaminase	Histamine (µg. per litre of blood)	
			In blood-cells	In plasma
95	11	±	35	Trace
96	12	±	25	20
97	?	± to +	60	30
98	22	−	45	70
99	36	+ − to + − −	80	20
Mean	..	..	49 ± 9·7	..

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WITHDRAWAL SYMPTOMS IN CANNABIS-INDICA ADDICTS

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DURING the early days of a campaign in the Far East, several cases of an acute psychosis associated with the withdrawal of cannabis indica from addicts came to my notice. All these cases came in the first four weeks of the campaign and all were in Indian troops.

Hemp grows readily in certain parts of India and in such parts is easy to obtain. As an intoxicant, for smoking and chewing, it is made in the three forms of bhang, ganja, and charas.

1. *Bhang* consists of the dried leaves and small stalks of the hemp: a few fruits occur in it. It is of a dark brownish-green colour, and has a faint peculiar odour and but a slight taste. It is smoked with or without tobacco or it is made into a sweetmeat with honey, sugar, and aromatic spices: or it is powdered and infused in cold water, yielding a turbid drink.
2. *Ganja* consists of the flowering and fruiting heads of the female plant. It is brownish-green, and otherwise resembles bhang, as in odour and taste.
3. *Charas* is the resin itself collected, as it exudes from the plant.

Altogether 9 cases came to my notice, and all gave a similar history and presented similar signs. All had been indulging in ganja smoking for some years and they soon began to notice signs of deprivation when they left India; 2 showed signs of extreme irritability on the sea voyage but got over this when they managed to procure some more ganja from their comrades. On arrival at their destination all began to suffer from deprivation; the Indian hemp plant did not grow so widely, and ganja became difficult to obtain.

Each case was known to his comrades as a ganja addict; he was regarded with a certain amount of fear, and was known to be untrustworthy. Irritability increased and culminated in a sudden outburst of violence, such as stabbing another man, striking out, or shooting at someone. A common history was that the man had been on guard duty and had suddenly begun to blaze away with his rifle or Sten gun at an imaginary enemy. This sort of conduct resulted in the man being brought under medical observation; and the strange, and often dangerous, fact was that by the time he got back to a medical unit he had become quiet and apparently rational. During this quiet phase, the man seemed mildly depressed but was appreciative of attention; he took his food and enjoyed a smoke. Patients have been returned to their units during this quiet phase with disastrous results. After 48–72 hours there was another outburst of impulsive violence, followed by an acute psychotic episode lasting 3–6 weeks. This phase was characterised by acute excitement; the patients shouted and talked at great length, interfered with other patients, and were very quarrelsome. They stripped themselves of all clothing and masturbated almost continuously; their habits became filthy, fæces and urine being passed in the bed or on the floor. Some would sing at the top of their voices for hours. On seeing a nursing orderly or a medical officer they would crawl abjectly along the floor and beg for some ganja. If offered an ordinary cigarette they would snatch it from one's hand and chew it up or smoke it as quickly as possible. At times, most of the patients appeared to be both visually and aurally hallucinated and the hallucinations were terrifying. They could understand what was said to them and would start to obey an order, but their attention would flag quickly and they would again start to beg for more ganja. If unsupervised they would fight amongst themselves for a cigarette end. Some cases ate their food in a voracious manner whilst others refused both food and water.

All these cases were treated by sedation with either *soluble barbitone or paraldehyde, which were the only* sedatives available; they were also given ordinary cigarettes. Continuous narcosis was first aimed at, but in 2 cases an intercurrent infection—pneumonia in one and malaria in the other—developed while the patients were deeply sedated; so the other cases were not given so much sedative.

None of the 9 patients died, which surprised me; and all emerged from the psychotic phase after a period of 3–5 weeks; they then became quiet, coöperative, and well-conducted, though all were weak and emaciated, and required considerable feeding up. All were evacuated to India.

DISCUSSION

It is clear that some cannabis-indica addicts cannot manage without the drug; when deprived of it they develop a dangerous mental illness. It seemed that the proportion of addicts who developed this illness was comparatively small; certainly there were far more than 9 ganja addicts in Indian units served by the medical unit at which I was stationed. All 9 men smoked ganja continuously when at home in India, and all were of average intelligence; they came from various units—some high-grade, others pioneer units.

Clearly it would be safer if known cannabis-indica addicts were not employed on foreign service.

Preliminary Communication

ACUTE LARYNGOTRACHEOBRONCHITIS TREATED WITH CHLOROMYCETIN

Laryngo-tracheo-bronchitis is one of the most alarmi emergencies with which the children's physician has deal. Other acute affections of the respiratory tr usually appear to yield to chemotherapy; but this c like atypical pneumonia, has apparently been uninfluenc by such treatment. There is some evidence that it caused by a virus.

Attacking children between six months and th years of age, with a sudden onset, the infection le rapidly to a critical state, often necessitating tracheoto and bronchoscopic suction. Of six children, all enough to require surgical intervention, treated at Hospital for Sick Children, Great Ormond Street, si December, 1947, four died. On the admission of seventh case Dr. I. A. B. Cathie suggested the trial 'Chloromycetin,' and the result seemed to be drama Though one of the youngest of the small series certainly the youngest to survive, this child's st changed rapidly from one of extreme seriousness to of easy convalescence. All other adjuvant measu were used: the child was nursed in an oxygen tent w "special" nurses; tracheotomy was performed suction carried out as required. Chloramphen (chloromycetin) was given by mouth in 0·25 g. d three times a day for four days, starting a few ho after the tracheotomy. The thick, tenacious secret found at tracheotomy in these cases became thin less profuse than in other cases. Bronchoscopy was o required once, the temperature reached normal in hours, and the tracheotomy tube was removed wit five days.

Details of the seven cases are:

Case	*Age*	*Duration of severely obstructed breathing before tracheotomy*	*Resu*
1	1 year 1 month	24 hours	Die
2	2 years	3 hours	Liv
3	*10 months*	*12 hours*	Die
4	9 months	30 hours	Die
5	2 years 11 months	1 hour	Liv
6	1 year	36 hours	Die
7	1 year 3 months	12 hours	Liv

It will be noted that the children who survived w those in whom tracheotomy was performed early, chloramphenicol must not be regarded as a substit *for mechanical relief of obstruction at an early st* when required.

This preliminary note is intended to encourage oth to try this new drug for a disease with an unfortunat high fatality-rate. It is unlikely always to obviate necessity for the skilled assistance of surgical colleag but it may shorten the whole period of illness and ren the infection less virulent.

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". . . Consider medical salaries: a psychiatrist in prison service has a salary scale of £1000–£1400 a y A similarly qualified officer in the National Health Ser is on a scale of £1700 (linked to age 32) rising . . . to a ma mum, reached in eight years, of £2750. Does this mean t salaries are fixed on a catch as catch can basis? *Or t* the Government have decided they do not want psychiatr in the prison service but lack courage to announce *the fa* Or . . . that it is Government policy to reduce the medi Civil Service to a cipher? *One can illustrate this lack* any clearly conceived policy at any and every level.' —Mr. Stanley Mayne, general secretary of the Institut of Professional Civil Servants, in a letter to the *Tim* Oct. 18.

Medical Societies

ROYAL SOCIETY OF MEDICINE

Rheumatoid Arthritis

MEETING of the section of physical medicine on 12, with Dr. HUGH BURT, the president. in the chair, devoted to the effects of treatment with 'Cortisone' adrenocorticotropic hormone. Dr. Burt emphasised importance of the discovery of cortisone not only he study of arthritis but also for general medicine.

T. OSWALD SAVAGE, anticipating the question oes cortisone work?" replied with an emphatic mative, and described the two patients suffering from matoid arthritis whom he had seen before and after atment. He then sketched the history of the discovery ortisone. reminding his audience that rumours of the ct of suprarenal cortical extracts on soldiers and ts suffering from battle fatigue had drawn attention these substances. He recalled Hench's prolonged dy of rheumatoid arthritis and the fact that this rker had recently discarded the microbic theory of ology and had emphasised the potential reversibility rheumatoid arthritis. postulating in 1948 that there ist be an "antirheumatic factor *x*" potentially pable of reversing the effects of the disease. Hench d concluded that some such substance might exist the suprarenal cortex and had consulted Kendall on is subject. While there were at least 28 suprarenal roids, only 6 of these were known to be active, and in eumatoid arthritis it was the 11-oxysteroids that were portant. These acted on carbohydrate metabolism, using a rise in liver glycogen content and an increased ea excretion. The pituitary adrenocorticotropic horone (A.C.T.H.) caused an increased secretion of supranal steroids. In 1940 Kendall had isolated cortisone, 17-hydroxy-11-dehydrocorticosterone, and had called Compound E. It was this compound that Hench ecided to investigate in rheumatoid arthritis. After s intramuscular injection in adequate amounts patients nickly lost their tenderness, pain. and stiffness, and eveloped a remarkable euphoria and ravenous appetite. r. Savage showed slides provided by Hench which lustrated the improvement. He went on to say that he increased sedimentation-rate and lowered hæmolobin of rheumatoid arthritics responded well to ortisone therapy though not so instantaneously as the linical condition. It seemed that for cortisone therapy daily injection of 100 mg. was necessary, while for .C.T.H. 25 mg. had to be given three times a day.

The side-effects of cortisone therapy would have to e carefully studied. Obesity. hirsuties, amenorrhœa, nd depression had all been noticed. So far as was known. cortisone therapy had to be continued indefinitely, for patients had all relapsed when injections were stopped. On the other hand only severely affected patients had so far been treated. Cortisone was an extremely scarce and expensive drug which at present was synthesised from desoxycholic acid by a process involving 39 difficult chemical steps. In Dr. Savage's opinion the significance of the discovery was that it had shown that rheumatoid arthritis could be reversed by drug therapy and that it was a yardstick by which to estimate the value of other forms of treatment.

Dr. RAYMOND GREENE pointed out that there had been much study for many years on the relation between the suprarenal cortex and arthritis. Selye in 1944 had shown that desoxycorticosterone, when administered under certain conditions, could cause arthritis, and in 1946 had described his "adaptation syndrome" which possibly inspired Hench. Dr. Greene himself had studied the exciting causes of rheumatoid arthritis for a long time and had concluded that the hypothalamus and suprarenal cortex might play a related part in its ætiology. This had led him to treat patients with 'Eucortone' and pituitary adrenocorticotropic hormone, but he had found that whole suprarenal cortex was ineffective. He described how. in 1946, he treated a desperately ill rheumatoid arthritic. who also suffered from pemphigus, with intravenous procaine, following Ungar's suggestion that this stimulated the suprarenals. Subsequently A.C.T.H. and procaine were given and the patient made steady progress with occasional relapses. Later the patient developed jaundice. which again improved his arthritis and his rash. He was now apparently cured, showing only residual deformities of the hands. Dr. Greene then introduced this patient to the audience as the first patient who had been treated for rheumatoid arthritis with corticotropin. He was now, he said, testing substances having an inhibitory effect on histamine production. He had had some success with large doses of intravenous procaine, which possibly worked through the suprarenals. He then recalled the work done by Bach and Savage on splenectomy for rheumatoid arthritis and reminded the audience that Ungar had found splenin A in the blood of normal controls but splenin B in the blood of rheumatoid arthritics. He had confirmed the finding of splenin B in active rheumatoid arthritis and he called for further study of the rôle of the spleen in the disease.

In the subsequent discussion Dr. M. GOOD described long-continued cortisone therapy as very dangerous. He said that he had worked out a perfectly satisfactory method of curing rheumatoid arthritis at any stage by injecting myalgic spots with small doses of procaine. Dr. FRANCIS BACH regarded the work on cortisone as a valuable investigation rather than, as yet. a form of treatment. He suggested that the time would come when the part played by the thyroid, the spleen. and the suprarenals could be correlated in a scientific manner.

Reviews of Books

Textbook of Surgery

PATRICK KIELY, B.SC.. M.CH.. F.R.C.S., professor of surgery, University College, Cork. London: H. K. Lewis. 1949. Pp. 1184. 45s.

THIS is a textbook of general surgery written by a single author because to "the student the whole subject of surgery must be presented in a general way and must be reasonably balanced." In this sentence Professor Kiely gives us a strong argument for the single-author book. This. at all events. is a work of admirable balance, in which the statements about disease are obviously based on observation and experience and so have the imprint of truth. It has no special chapters on bacteriology and immunology, referring to these subjects only in connexion with special surgical conditions. The teaching is similar to that in English textbooks, but a few points may be criticised. Penicillin has so greatly revolutionised our ideas about septic infections that Professor Kiely might have referred more prominently to its use. For instance, large incisions for whitlows are no longer necessary. and particular objections can be raised to the "fish.mouth" incision recommended. Though extremely practical, he is rather superficial in his descriptions of diseases: nobody could acquire. from his account. any definite views about the pathology of the enlarged prostate or of chronic mastitis—or even get mildly interested in them from that point of view. Lane's and Brophy's operations for cleft-palate are never done in this country; and the prolapsed intervertebral disc is very seldom approached transdurally. but the recommendation to divide the affected dorsal root. if it can be distinguished. is sound. Modern operations for carcinoma of the œsophagus and for cardiospasm do not seem to be described. These small points and a few others could be easily remedied in subsequent editions. In general the book is reliable. and gives the mature judgment of an experienced and intrepid surgeon.

Textbook of Bacteriology

C. H. BROWNING, M.D., F.R.S., Gardiner professor of bacteriology, University of Glasgow; T. J. MACKIE, M.D., professor of bacteriology, University of Edinburgh. London: Oxford University Press. 1949. Pp. 907. 50*s*.

FOR forty years medical students read Muir and Ritchie's handbook, but progress in bacteriology has been so rapid that the 1937 edition has been losing its place on the shelf. Now it reappears in handsome and enlarged format—a comprehensive textbook on protozoa and fungi as well as on the bacteria and viruses which attack man. It has been almost entirely rewritten and now includes an account of most recent advances on the subject. It will be read more by the advanced student and bench worker than its predecessor was, and less by the man who wants to know what is wrong and how to treat his patient. The accounts of individual bacteria are accurate though often discursive, and in the virus section compression has not always made for clarity. The chapter on fungi by Dr. Cranston Low is a good account of essentials, and the protozoa are also clearly described. The handbook always had excellent black-and-white illustrations, and many of the new ones maintain the standard. There is a valuable bibliography: but a few subjects, such as bacteriophage, have some references of parochial rather than of general interest. In its fifty-second year the book takes a new lease of useful life.

Testing School Children

WILLIAM STEPHENSON, M.A., M.SC., PH.D., fellow of the British Psychological Society, sometime reader in experimental psychology, University of Oxford. London: *Longmans, Green. 1949. Pp. 125. 12s. 6d.*

Dr. Stephenson is convinced, as are many others, that great danger lies in too hard and fast a selection of children at eleven years for placing in the different kinds of secondary school.

He would like to see something nearer the American style of a single-type secondary school, followed by university education for all who wish it. He is a self-confessed admirer of American education, but he vigorously trounces some of the results. Nor is he blind to the fact that a higher degree of standardisation in schools would inevitably lead at first to a levelling down. This admission is in arresting contrast to several remarks in the book, where his admiration of good preparatory and public-school education seems to have almost a snob value. Nevertheless, his hot-headed tilting at present-day selection for schools should keep us from any complacent notion that the Education Act, 1944, now provides an equal opportunity for all.

His chief contention is that eleven is far too young an age for children to be separated into several streams; it enforces fantastically early specialisation, and thus robs them of "[illegible] ucation which we hoped to ensure by [illegible] Certificate examination and instituting record cards.

Next he sounds a warning note about the indiscriminate use of intelligence tests, particularly by untrained workers, who, he suggests, apply a test (often any test), with a view to reading off the I.Q. much as one would read off the temperature on a thermometer. In a simple, even rather sketchy, way he explains that "intelligence" has many facets, and that tests chosen to discriminate between some of the different factors can also be used to tell us a great deal about the children tested.

Modern selection methods, as everybody knows, are not needed to pick the tops and the bottoms; anyone can do that. But *in skilled hands* they can be valuable in revealing latent capacity in the apparently mediocre, and thinness of quality or superficiality in the apparently first-rate. In an appendix Dr. Stephenson gives tests which he considers suitable for applying to eleven-year-olds; but since he deliberately omits any reference to norms and standards of scoring, they only stimulate thought as to what a test really tests.

His are arranged so as to occupy a whole day, and test mainly the G-factor (general intelligence), verbal facility (V-factor), and kinæsthetic ability (K-factor). The last are interspersed with some arithmetical tests. He ends with a poetry-completion test which he considers calls for originality in thought, as well as skill in manipulating word imagination and feeling combined. An inhibited c thinks, lacks the capacity to gratify his felt needs, a will result in a lack of creative imagination, brought this test.

The practical value of such a scheme of testing be judged without much further information; scheme as a whole is challenging and arresting, a book will take both child and tester into a stim mental atmosphere. The appendix incidentall contains a brief account of the Rorschach test to the author acknowledges his debt.

Die Insulin-Lipodystrophie

DR. FERDINAND ADALBERT KEHRER, director of psychiatry clinic, University of Münster. St Thieme. 1949. Pp. 50. DM. 4.50.

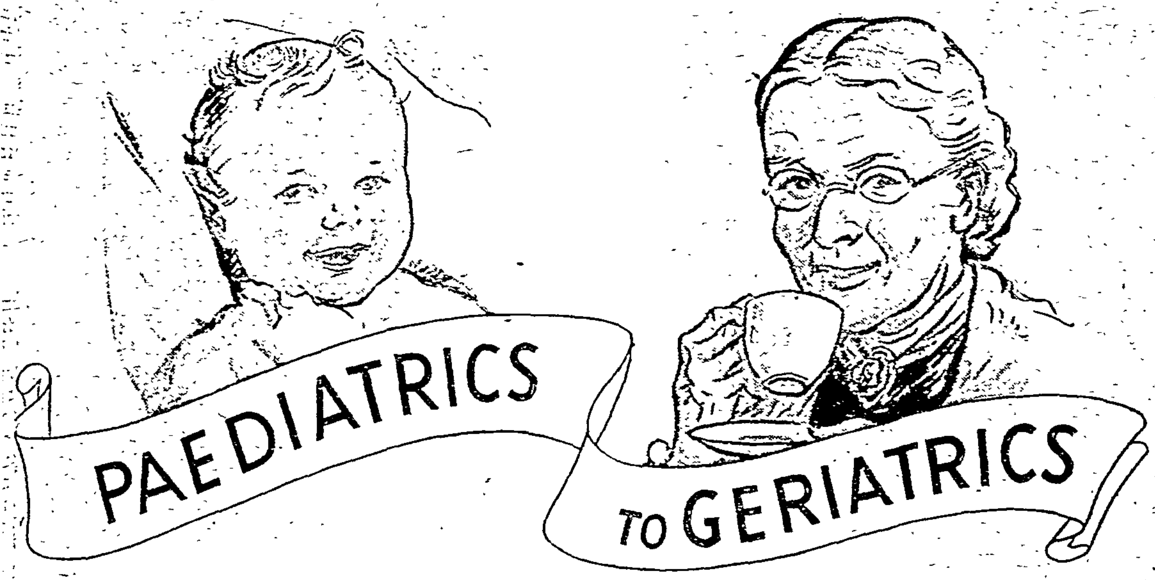
THIS small book describes most of the aspects mysterious disappearance of fat not uncommonl at and near the site of insulin injections after mo years of treatment. It confirms the well-known fa it occurs mostly in women and children, and onl rarely in men. A sifting of the literature, almost German, leads to no explanation of the funda pathological or ætiological factors and no useful sugg about treatment.

Medical Annual 1949 (67th year. Bristol: John W Sons. 1949. Pp. 448. 25*s*.).—A strong following stand un editorial banners of Sir Henry Tidy and Prof. A. Short, who here renew their annual campaign to kee to date. As usual the introduction gives promin subjects of special interest, and the subsequent pa packed with well-informed articles, alphabetically a and helpfully illustrated.

Principles of Human Physiology (10th ed. L J. & A. Churchill. 1949. Pp. 1193. 42*s*.).—Good boo no puff. Most medical students become familia "Starling," in their second year, and the intimacy is through life. Prof. Lovatt Evans's latest version of the is slightly larger than the last, thanks to new matt 60 new figures. The duty of the author of a textb remarks in his preface, is "to select such exam represent, in his opinion, either current trends o established advances." He leaves to his reade fascinating task of identifying new features in this editi

Synopsis of Medicine (9th ed. Bristol: John Wr Sons. 1949. Pp. 1243. 30*s*.).—Sir Henry Tidy's synop become so well known a standby to both students and that little need be said about this new edition, the ninth first appeared in 1920. A synopsis, according to the dict means "a collective or general view of a subject." fully true of Tidy's book, which has become a compre and almost indispensable work of reference. The new includes for the first time temporal arteritis, acute necrosis of the kidney, and the influence of maternal on congenital defects. Many new paragraphs have been and it is surprising how little has been omitted in the field of clinical medicine. In spite of new matter t has been only slightly increased.

Hematology for Students and Practitioners (2 London: Hamish Hamilton Medical Books. 1949. P +viii. 44*s*.).—This volume by Prof. Willis M. Fowler o is reasonably long, well produced, and well illustrated various blood diseases are dealt with succinctly, but frills are allowed and the telegraphic style happily is a Each chapter ends with a useful list of key references, is pleasant indeed to see British workers, properly sented. Unfortunately, Professor Fowler still adhe views about the development of erythroblasts and er cytes in health and disease which have been discarded country for some years. He does this quite deliberatel states his reasons. But this means that his textbook be recommended to students or practitioners in this co since they will have to go elsewhere for a description anæmias which will correspond to that of their teachers these have reasons for their views at least as good as Pro Fowler's. The illustrations are inadequate, and even— erythroblasts are concerned—positively misleading. T a pity because there is an opening for a book of this le though at a more moderate price.



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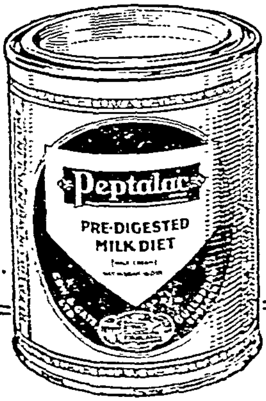

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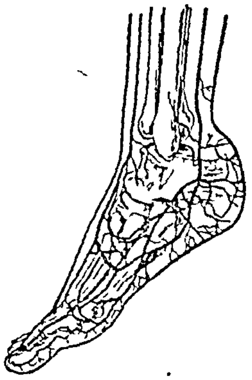

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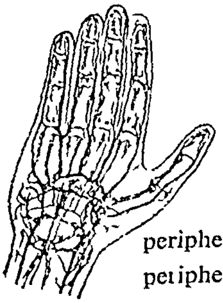

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THE LANCET

LONDON: SATURDAY, OCT. 22, 1949

The Distinction Awards

NEW ideas, whether good or bad, have a precarious : a hundred and one reasons can always be found killing them off. The Spens Committee produced a w idea for countering the deadening effect, in a national vice, of payment according to rank and seniority.

> "We are satisfied," they said, "that there is a far greater diversity of ability and effort among specialists han admits of remuneration by some simple scale pplicable to all. If the recruitment and status of specialist practice are to be maintained, specialists must e able to feel that more than ordinary ability and effort receive an adequate reward. Moreover, a reward which would be appropriate when these exist would be extravagant when they do not. In consequence we are clear that any satisfactory system of remuneration must involve differentiation dependent on professional distinction."[1]

his led to the proposal that after a specialist had ached his maximum basic salary of £2500 (now 750), his remuneration should cease to depend in ay way on the length of his service, but that distinc-on awards, of three different grades, should be made 34% of specialists selected (by a mainly professional dy) as exceptionally meritorious. On this basis, nd not otherwise, the committee persuaded a reluc-nt Treasury that doctors in the National Health ervice should be able to earn well over £5000 a year ithout private practice. A Socialist Government ay well have felt that £2750—which was rather more han previous professorial salaries—was an adequate alary for consultants; but it was induced to add ell over another million pounds by the argument hat particularly good work should bring financial dvantage.

In due course a Distinction Awards Committee was ppointed, with Lord MORAN as chairman. Obviously ts members could not possibly know all the thousands f possible candidates for these awards, and they have herefore begun by asking help from people who do know them—from the medical committees of teaching hospitals, from the assessment committees of regions, and from the Royal Colleges and specialist associations. It is at this point, when consultants find themselves (as they feel) reducing some of their friends' incomes, that the new idea reaches its greatest danger; for those who rejected it from the first are joined by those who find its application difficult and distasteful. The difficulty and distastefulness are real enough: and what could seem more convincing than Dr. WALSHE's condemnation of the whole business?

> "It is one thing to grade a series of posts but quite another to seek to grade professional distinction, and it passes my comprehension that anyone who has spent his working life in medicine—unless as an administrator—could suppose that a grading of this order can be rationally and equitably accomplished. . . . What constitutes 'distinction' in medicine? Is it aptitude in the variegated arts of worldly success? Is it clinical wisdom, therapeutic fervour, or the acceptable usage of the forms of sickroom politeness? Is it the gift of training students or fruitfulness in original research? Is it the acquisition of seniority by lapse of years or a flair for planning the activities of one's colleagues? Is it to be a Mary or a Martha in medicine? How are these incommensurables, these diverse qualities of mind, heart, and worldly wisdom, to be comparatively assessed in terms of sterling?"[2]

But Dr. WALSHE, unlike the Spens Committee, is not setting his mind to the solution of a practical problem. He may be right in saying that the value of various professional attributes cannot be compared; yet it is still true that a man's colleagues generally have an opinion on whether he is doing especially good work or in some way making a contribution beyond the ordinary. To be asked to say which of one's associates is outstanding, and if so to what degree, need not seem outrageous if one remembers that we are all assessing other people all day long. The patient assesses the practitioner; the practitioner assesses the consultant; and the consultant assesses the candidates whenever he helps to choose a houseman or a registrar or a new member of the staff—all of which assessments have financial implications. To assess a colleague for an award is more uncomfortable in one way, because he is a colleague; but it is less uncomfortable in another way, because the assessment will not be decisive but is merely part of the evidence on which a central committee, with its own policy, will compile the final list. The more the responsibility is spread between different advisers, the less need anyone feel that he has let his associates down or has been let down by them. There are bound to be mistakes, if only because the merit of doctors, like the merit of poets and artists, is not quite always apparent to those around them, and because dividing lines are tenuous, to say the least. Also, as in the nursery, at school, in the Army, in the Honours List, and even in the learned societies, there will be an element of luck in the distribution of the rewards. Perhaps the wisest attitude for the possible recipient is to recognise the contest as one in which nobody loses though some can win: he should neither count on a prize nor feel deprived if it does not come his way.

At the same time the scheme stands or falls by whether, broadly speaking, the awards are the right ones: and this brings us to the question of its possible abandonment or modification if instead of standing it is found to fall. There are those who think it fundamentally unstable; and without a trial we cannot prove them wrong. There are those who would confine it to whole-time members of the service, leaving the part-timers to draw their supplementary incomes from private practice. There are those who believe it could only be made tolerable by removing the element of personal judgment and substituting a points system by which distinction would be estimated objectively. There are some who would like the awards kept private, and many who favour smaller changes in the present arrangements. It would indeed be strange if so important a scheme, which may prove a major precedent in the organisation of other national services, were free from defects at its inception; and in reaffirming our own faith in it we must admit that the only convincing test is experience. Since in fact a considerable number of consultants are assisting the Distinction Awards Committee against what they believe to be their better judgment, and others have refused to assist at all, might it not be best to meet the objectors and the doubters by declaring that the scheme is experimental—by setting a term of perhaps five years to the awards now made, after which consultants as a body could themselves decide whether it be discontinued or altered? If this novel system of remuneration were introduced in the form of a terminable trial rather than as an irremovable feature of the new service, it might be more acceptable to the minority who are not yet convinced that it is sound.

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[1] Remuneration of Consultants and Specialists. Cmd. 7420. H.M. Stationery Office, 1948; p. 10.

[2] Walshe, F. M. R. *Brit. med. J.* Aug. 13, p. 353.

On the other hand we have no doubt that the system, experimental or not, should now be introduced, and we believe the majority of consultants to be of the same opinion. The mechanism by which, under the old order, special merit was specially rewarded has largely broken down in the National Health Service, and it needs to be redesigned in one way or another. We share the view of Dr. BURNS[3] that the kind of distinction that ought to be recognised is "distinction in professional service to the community," and we hold that the profession is on the whole capable of assessing such service more justly than the laity. Of course, general practitioners and patients will be foolish if they suppose—as some of them will—that a consultant is necessarily less suitable for their purpose because he has no award or because it is not the highest: every wise man should know that rank of any kind is but the guinea stamp. But what Dr. WALSHE derisively terms "a first, a second, or a third class 'distinction' label issued from Whitehall" should at worst be no more misleading than the title, the car, the clothes, and the address, by which the standing of the specialist has too often been judged in the past. And to accept at this stage the alternative of standard salaries would be, as Dr. BURNS said, "to surrender to the commonplace mind."

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THE Vaccination Acts of 1867–1907, for many years more honoured in the breach than the observance, were repealed by the National Health Service Act; so since July 5, 1948, all semblance of compulsion has been removed. The popularity of diphtheria immunisation, when offered to young children on a voluntary basis during the war, led those responsible for part III of the Act to hope that the removal of compulsion, backed by a tactful approach to parents, would stimulate rather than discourage infant vaccination. The late Professor GREENWOOD,[4] on the other hand, forecast a decline in vaccination to a negligible figure unless there was an epidemic of major smallpox sufficiently severe to alarm the public, as happened in 1901–02. CONYBEARE's summary[5] of the figures in England and Wales for the first six months of the service shows that, though there are wide local variations, this forecast has in general proved correct. In England only just over 18% of the children born in the first half of were vaccinated *before* the end of the year and Wales barely 10%. The comparable figure for Englan and Wales during the ten years 1937–46 was 36·8% so the proportion of children vaccinated duri the first year of life has been halved.

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4. Greenwood, M. *Ibid*, 1948, ii, 22.
5. Conybeare, E. T. *Mon. Bull. Min. Hlth, P.H.L.S.* October, 1949, p. 204.
6. *Lancet*, 1949, i, 549.

tious disease. is unlikely to be acceptable: and awhile the M.O.H. who embarks on a vaccination paign is often deprived of his strongest ally— family doctor. Moreover, while the fee remains ecided there is a greater likelihood of vaccinations by practitioners not being recorded, and therefore included in the published figures. Inquiry in chester shows that since the Appointed Day about of the vaccinations done have not been notified; e represent 3·8% of the infants born.

ow can the position be improved? In some places, Leicester, which has an antivaccinationist tradi- almost as old as vaccination itself. and which s CONYBEARE's table with 1·4%, this may be a h proposition. though if smallpox did arise in neighbourhood there would probably be no culty in persuading contacts to be vaccinated. e usually it is inaction rather than opposition the part of parents which has to be overcome, first step is to reinstall a system of reminders. Canterbury when a birth is notified the parents eive a postcard telling them how to arrange for vaccination from their doctor or the clinic; necessary they get a second postcard when their y is 3 months old; and when they bring their ld for diphtheria immunisation they are again ted about vaccination. Some such practice should general. The other essential step is to remove the rental inconveniences of vaccination. In rural as a return to some domiciliary system seems avoidable, and even in towns the personal persua- n of a public vaccinator, calling at the child's me, would be a valuable support to the M.O.H.'s opaganda. If the parents of all children who had ached their fifth month without responding to e M.O.H.'s reminding notices were visited by public vaccinator large numbers of the present tagglers would certainly be rounded up.

Work the Old Can Do

LENGTHENING lives have dislocated the seven ages man. There are, of course, some lean and slippered ntaloons about, and every doctor sees cases of cond childishness and mere oblivion: but these anifestations of great age come on much later than ey used to do. The hale old man in the seventies d the hearty old woman in the eighties are beginning lose the charm of rareness: and nowadays rela- ely few people are really old at sixty-five. They ay have some signs of decline, such as failing sight or earing, and loss of muscular power; but. as Sir RNEST ROCK CARLING pointed out at a conference[1] n Oct. 14, these defects are not the prerogative of d age. The old are often said to have less endurance han the young; and will themselves assert with ride that you can't teach an old dog new tricks. But all depends (as we have learned to say) on what you ean by endurance, and what kind of tricks you propose to teach. In industry during the war absence-rates are said to have been no higher among the old than among the young; and work at Cambridge has shown that the elderly can master new techniques. They learn more slowly than the young, certainly, but they also learn more carefully: they destroy less material in the process and they take much better care of tools.

This is not to deny that there are many old. ailing, and neglected people in the country: in the last few years we have become increasingly aware of them; and indeed their needs have been considered more and more seriously ever since the first old-age pensions were granted in 1908. But it is also true that for men of sixty-five the expectation of life is nowadays 11·68 years. while for women at sixty it is 17·13. The retiring age of sixty for women and sixty-five for men was presumably fixed on the understanding that most people would observe the Psalmist's threescore and ten. It seems, at first glance, to be both grudging and fluffy-minded to give adequate retirement pensions and then point out that there is plenty of good work left in the retired; but that is what comes of trying to lump people together and judge their capacity by their age. Speaking at the same conference, Mr. W. A. SANDERSON, assistant secretary of the Nuffield Foundation, outlined the position in which this failure to discriminate will ultimately place us. To care for 50,000 sick old people in hospitals, and to house and look after a further 55,000 in residential homes and institutions already costs us £20–25 million a year. These represent only 1 in 60 of people of pensionable age in the country, and many could do with such care who are not getting it. The Royal Commission on Population[2] stated that in 1947 the pension scheme was costing £265 million, more than half of which came from the taxpayer. The number of people of pensionable age (already 6 million) is to be 8 million by the end of the century: and if all of these claimed pensions they would cost 4*s*. in the £1 in income-tax. This. said Mr. SANDERSON, is not an argument for going back. or going slow, or reducing pensions; but it *is* an argument for not putting anything in the way of those who want to go on working. We can only give pensions up to the limit of our capacity—that is, up to the limit of what we produce. If we want more for old people we must work more and they must help us. The size of the future labour force will not increase and may decline. The extra year of schooling will lose us a third of a million workers, and the county colleges will lop man-hours still further.

Many men dislike retiring at sixty-five; and some even seem to decline to death from the effects of idleness and boredom. Mrs. LEWIS told of men who after retirement catch the same train in the mornings as they have always done, spend the day in the public library, and catch their usual evening train back, merely for the sake of exchanging gossip with their friends. For many people, to retire is to lose a great part of their social life. The self-employed man rarely gives up work at sixty-five; and women never retire at all from housework. Again. retirement is not exacted in all callings; ancient judges are a commonplace on the bench, old actors fall into new parts, old professors contribute their knowledge and experience to university life. Nor do all firms insist on a compulsory retirement age: though banks and public services nearly always have rigidly enforced rules, in reaffirming our own faith in it we must admit that the only convincing test is experience. Since in fact a considerable number of consultants are assisting the Distinction Awards Committee against what they believe to be their better judgment, and others have refused to assist at all, might it not be best to meet the objectors and the doubters by declaring that the scheme is experimental—by setting a term of perhaps five years to the awards now made, after which consultants as a body could themselves decide whether it be discontinued or altered? If this novel system of remuneration were introduced in the form of a terminable trial rather than as an irremovable feature of the new service, it might be more acceptable to the minority who are not yet convinced that it is sound.

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[1] Conference on the Care of Old People, arranged by the National Old People's Welfare Committee and the National Council of Social Service.

[2] Report of the Royal Commission on Population. H.M. Stationery Office, 1949. See *Lancet*, 1949, i, 1105, 1110.

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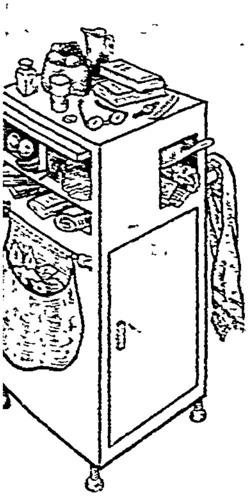
[6] *Lancet*, 1949, i, 549.

urely what the patient wants is what most of us it in our own homes—something that will enable o look tidy without actually being tidy. A sizeable board, in short, with an easy door which will t away our iniquities. The nurse wants it too; can empty it quickly, clean it easily, and tidy it in a minutes. This bedside cupboard should be raised l from the floor, so that the patient need not stand his head to get anything out of it, and should e a few shelves in it so that clothes and books be separated from food and soap-dish. Though B.S.I. include a cupboard (or even cupboards) in st of their designs, its potential capacity has nearly ays been reduced in favour of pigeon-holes. In the design illustrated here there are no less than five pigeon-holes (one being round at the back). The etceteras are drawn from our memory of a similar locker in use. Sliding tables, such as that shown here, are, we believe, best avoided in the interests of cleanliness and simplicity.



The B.S.I. do not favour drawers, which they say are difficult to clean; but the designer's wife could tell him how much easier it is to take out a drawer and turn it upside down than to pry into the recesses of a cavity. Besides a roomy cupboard, the patient ants a shallow loosely running drawer near the top the cabinet, in which he can keep his money and s pipe (or her knitting and her powder). As gards the two towel-rails, there are many moments a leisurely fruit-eating day when one wishes to ipe the fingers on a hand towel, but bath towels ould be hung where they can dry completely; and the ward has no airing cupboard with numbered ils, then the hospital carpenter should be asked to it a plain bar over, or to one side of, the radiators etween the beds. Towels folded neatly and hung these would not look as unsightly as the clumsy indle now crammed on locker-backs—indeed, loured towels could look very pleasant.

For social life as lived in the ward the patient ill ask no more of his locker than a cupboard, a rawer, and a single rail. He will find, however, at some other obligations are thrust upon him. hat is he to do with a full urine bottle until the urse comes to collect it? The B.S.I. are rightly against is using the recesses of his locker as a resting-place for ; but there they dismiss the distasteful subject, leaving he patient holding his bottle. This can be a lengthy nd even tiring occupation in an understaffed ward. hat he needs is some kind of rack, on a level with he bed, which will hold the vessel at a safe angle and rotect it from sudden jolts. In men's wards a chromium r wooden shelf set at an appropriate angle, and with raised edge, might well be attached to the side of the locker at such a height that the patient could slip the bottle on to it with little effort. This would also encourage the quick removal of bottles, for though a busy nurse may forget to collect a concealed bottle, she would naturally take in passing any that she could see at a glance.

The B.S.I. offer many sound reflections on material. Wooden lockers stand up to hard wear, but only if they are well made and waterproof at the joints. Metal lockers are apt to be noisy unless special sound-deadening measures are taken. Plastics used as finish should be chosen with discretion, since some resist heat well, but others are easily spoiled by it. These and many other facts set out in their draft deserve study by all interested in this fascinating and universal piece of hospital equipment. The B.S.I. invite criticism and comments, and these should reach the institution before Oct. 29.

Annotations

THE M.O.H.

The difficulties of public health, which Dr. Brockington describes on another page, were emphasised by Dr. H. C. Maurice Williams in his presidential address last Thursday to the Society of Medical Officers of Health.[1] He spoke of profound despondency among members of the public-health service about its future, of failing recruitment, and of disintegration. But he warned his hearers of the danger of a dismal outlook which may end by making people believe that the M.O.H. has outlived his usefulness. What the situation really demands is a renaissance.

Dr. Maurice Williams hoped, without much apparent conviction, that in the future, under the new régime, the people are going to get a better medical service than they got through the panel, the hospital contributory schemes, and the local authorities. Meanwhile he clearly feels that in some respects the practice of public health has become harder since July 5, 1948. It was, he said, an administrative blunder to place the infectious-diseases hospitals under the regional boards, removing them from the sphere of the M.O.H. who is still responsible for the ascertainment and control of epidemic infections. "There is a grave threat that the medical officer of health may be displaced in his field work by the general physician and pædiatrician"; which would be wrong because "the epidemiological unit is a number of individuals making up a population, and needs more than the clinical diagnosis or treatment of the individual case." Similarly the tuberculosis service has been mainly divorced from preventive medicine: "the change of designation of the responsible officer to that of chest physician will in itself encourage a tendency to concentrate on the more spectacular curative side of the work." To secure early treatment of the teeth of the priority classes, Dr. Maurice Williams thought that dentists in the N.H.S. would have to be asked to undertake one or two sessions each week in the local authorities' dental clinics.

> "The disastrous collapse of the school dental service should be a warning to those responsible for the future of the health scheme to think again before suggesting any alterations which will bring what is left of the school health and welfare services into the same state of chaos. The family unit idea of medical care by the general practitioner is, in theory, a reasonable conception; but in practice the ascertainment and follow-up of defects in children, many of whom belong to apathetic parents, requires an organisation capable of a systematic check on the periodical medical inspection and the correction of the defects found."

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[1] The address will appear in full in the November issue of *Public Health*.

there are many industries, including road transport, in which retirement is rarely required at a fixed age. Manual workers, however, often find that though no rule obliges them to retire, the conditions of their work may become too heavy for them in the later sixties. Some firms, taking this into account, find appropriate work for their own old employees who want to go on working; but very few will take on an old man who has been with some other firm. If the industry is a heavy one there may be no place in it for the elderly, and a man may thus be obliged to retire simply because he cannot find work suited to his capacity. It is no good "preferring" to go on working, Mrs. LEWIS said, if there is no work to be had.

Sir ERNEST ROCK CARLING suggested that if those past retiring age are to continue at work the sympathy of the employers, the trade unions, and the shop stewards must be engaged; and there was evidence from other speakers that this is not so formidable a task as might be supposed. Fellow workers, it seems, are nearly always sympathetic, and will work with an elderly man without resentment, arranging among themselves to spare him the heavier tasks. A shop steward reported that on a recent occasion when redundant staff was being dismissed, two younger men volunteered to go in place of two old men who stood next on the list for dismissal. Skilled old men encounter no problem: some up to eighty or eighty-five are to be found at work in industry, most of them ready to extol the virtues of age and experience. Nevertheless, if a large number of those past retiring age are to be encouraged to go on, some special conditions, Sir ERNEST said, are necessary: there must be no unemployment in the country, no question of using old people as cheap labour, and no detriment to their health; and they for their part must be willing to resign senior posts to juniors needing promotion. Some slackening off is permissible: they should get the same rate per hour but may be allowed to do fewer hours. It seems that in one industry at least this has been achieved; for in London many dockers between the ages of sixty-five and eighty are still at work. The elderly do not stand up well to hurry or to transport difficulties; and some firms arrange that they come ten minutes later and leave ten minutes earlier than the other workers, so that they miss the rush-hours on the buses. In other firms they are given work usually done by women or young people; but old men are apt to resent doing work usually done by women, though they will consent to do boys' work. Sometimes a whole department can be turned over to them. In one firm the filing and internal messenger systems have been reorganised so that old people can manage them instead of juveniles. It costs a little more, but the work is done more efficiently. The old people had to learn the job, and they take their time about it; but they are more reliable than the youngsters, and keep their minds on what they are doing. "There's no larking about on the stairs," as Mrs. LEWIS said.

As an *inducement* to continue in work, people are now offered an eventual addition of 1s. a week to their pension for every six months' employment beyond the age at which they are entitled to retire: *the Chief Press* Officer of the Ministry of Pensions, explaining this arrangement in more detail,[3] tioned that at present about two-thirds of the men reaching minimum pensionable age, and *half of the insured women, do not* claim th retirement pensions, because they are continuing regular work until later. The feeling at the conferen however, was that this inducement is too small encourage people to postpone retirement, though very well for those who want, and are in a go on working. Whatever the method, the p of making continued work seem inviting is sound. Economic necessity is one reason for doi this, but there is a better one. Thanks to one thi and another, we live longer than our forerunne and if geriatrics prospers our older people should not only alive but lively. Without prejudice to th who become infirm—and who must of course be giv more and better care of the kind we have lately be trying to offer them—the healthy old must have th chance to be active and useful. The lonely unoccupi old person is always bitter at his uselessness. Th sensible suggestion, made at the conference, that th public services should abolish their compulsory retire ment rules, would save many years of work which wil otherwise be lost, and give a lead to the whole country but it would do much more than that.

Bedside Lockers

BY those who design bedside lockers two opinions must be taken into account: that of the patient who always feels that there is no room for half th things he needs; and that of the nurse, who alway thinks that patients collect a lot of rubbish. Thes have been borne in mind by the British Standards Institution (B.S.I.), who have published some draf designs.[4] An efficient locker, they say, can lighter the work of the nurses and domestic staff and heighten the comfort of the patient; but it must be admitted that in these respects the designs they submit, despite several good points, are somewhat disappointing. Eight models are proposed, five of them general-purpose lockers, one for infectious-diseases hospitals and two for children's wards. They are all tall lockers, with their tops at a convenient level for the patient to reach from his bed, and all appear neat and plain—and empty—in the pictures. Nearly all of them have one or several open compartments—for books, papers toilet articles, and such personal effects as pipes and cosmetics; and most of them carry two rails—for bath and hand towels. Some have a third rail to carry a canvas bag for dirty handkerchiefs. But have the designers ever seen lockers of this type in action in any "long-stay" ward? They will find that the compartments are all filled to overflowing; papers stick out untidily; the top becomes crowded with sewing, painting, buns in paper bags, and bottles of sweets; books get stuffed into shelves at awkward angles; towels form a damp bunchy bustle round the back, and the whole effect is one of rakishness without charm. The little pigeon-holes which seemed so exactly fitted for their purpose by the designer are always subverted to other purposes by the unquenchable variety of patients. *Moreover* such *cavities* are maddening to clean out, because their inmost corners, rts of crumbs and dust, are always in shadow. locker with pigeon-holes can possibly lighten the urs of nurses and domestic staff.

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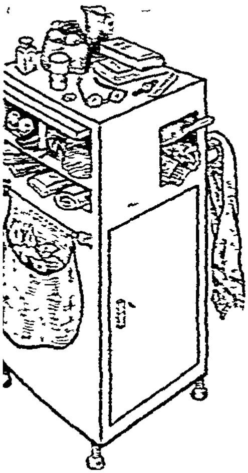
[3] [illegible], Sept. 21, p. 579.

[4] [illegible] for Hospital Bedside Lockers. Briti[illegible] 24–28, Victoria Street, London, S.W.1.

urely what the patient wants is what most of us t in our own homes—something that will enable o look tidy without actually being tidy. A sizeable board, in short, with an easy door which will away our iniquities. The nurse wants it too: can empty it quickly, clean it easily, and tidy it in a minutes. This bedside cupboard should be raised l from the floor, so that the patient need not stand his head to get anything out of it, and should e a few shelves in it so that clothes and books be separated from food and soap-dish. Though B.S.I. include a cupboard (or even cupboards) in st of their designs, its potential capacity has nearly ays been reduced in favour of pigeon-holes. In the design illustrated here there are no less than five pigeon-holes (one being round at the back). The etceteras are drawn from our memory of a similar locker in use. Sliding tables, such as that shown here, are, we believe, best avoided in the interests of cleanliness and simplicity.



The B.S.I. do not favour drawers, which they say are difficult to clean: but the designer's wife could tell him how much easier it is to take out a drawer and turn it upside down than to pry into the recesses of a cavity. Besides a roomy cupboard, the patient ants a shallow loosely running drawer near the top the cabinet, in which he can keep his money and s pipe (or her knitting and her powder). As gards the two towel-rails, there are many moments a leisurely fruit-eating day when one wishes to ipe the fingers on a hand towel, but bath towels ould be hung where they can dry completely; and the ward has no airing cupboard with numbered ils, then the hospital carpenter should be asked to ut a plain bar over, or to one side of, the radiators etween the beds. Towels folded neatly and hung n these would not look as unsightly as the clumsy undle now crammed on locker-backs—indeed, oloured towels could look very pleasant.

For social life as lived in the ward the patient ill ask no more of his locker than a cupboard, a rawer, and a single rail. He will find, however, hat some other obligations are thrust upon him. hat is he to do with a full urine bottle until the urse comes to collect it? The B.S.I. are rightly against is using the recesses of his locker as a resting-place for t: but there they dismiss the distasteful subject, leaving he patient holding his bottle. This can be a lengthy nd even tiring occupation in an understaffed ward. hat he needs is some kind of rack, on a level with he bed, which will hold the vessel at a safe angle and rotect it from sudden jolts. In men's wards a chromium r wooden shelf set at an appropriate angle, and with raised edge, might well be attached to the side of the locker at such a height that the patient could slip the bottle on to it with little effort. This would also encourage the quick removal of bottles, for though a busy nurse may forget to collect a concealed bottle, she would naturally take in passing any that she could see at a glance.

The B.S.I. offer many sound reflections on material. Wooden lockers stand up to hard wear, but only if they are well made and waterproof at the joints. Metal lockers are apt to be noisy unless special sound-deadening measures are taken. Plastics used as finish should be chosen with discretion, since some resist heat well, but others are easily spoiled by it. These and many other facts set out in their draft deserve study by all interested in this fascinating and universal piece of hospital equipment. The B.S.I. invite criticism and comments, and these should reach the institution before Oct. 29.

Annotations

THE M.O.H.

THE difficulties of public health, which Dr. Brockington describes on another page, were emphasised by Dr. H. C. Maurice Williams in his presidential address last Thursday to the Society of Medical Officers of Health.[1] He spoke of profound despondency among members of the public-health service about its future, of failing recruitment, and of disintegration. But he warned his hearers of the danger of a dismal outlook which may end by making people believe that the M.O.H. has outlived his usefulness. What the situation really demands is a renaissance.

Dr. Maurice Williams hoped, without much apparent conviction, that in the future, under the new régime, the people are going to get a better medical service than they got through the panel, the hospital contributory schemes, and the local authorities. Meanwhile he clearly feels that in some respects the practice of public health has become harder since July 5, 1948. It was, he said, an administrative blunder to place the infectious-diseases hospitals under the regional boards, removing them from the sphere of the M.O.H. who is still responsible for the ascertainment and control of epidemic infections. "There is a grave threat that the medical officer of health may be displaced in his field work by the general physician and pædiatrician"; which would be wrong because "the epidemiological unit is a number of individuals making up a population, and needs more than the clinical diagnosis or treatment of the individual case." Similarly the tuberculosis service has been mainly divorced from preventive medicine: "the change of designation of the responsible officer to that of chest physician will in itself encourage a tendency to concentrate on the more spectacular curative side of the work." To secure early treatment of the teeth of the priority classes, Dr. Maurice Williams thought that dentists in the N.H.S. would have to be asked to undertake one or two sessions each week in the local authorities' dental clinics.

> "The disastrous collapse of the school dental service should be a warning to those responsible for the future of the health scheme to think again before suggesting any alterations which will bring what is left of the school health and welfare services into the same state of chaos. The family unit idea of medical care by the general practitioner is, in theory, a reasonable conception; but in practice the ascertainment and follow-up of defects in children, many of whom belong to apathetic parents, requires an organisation capable of a systematic check on the periodical medical inspection and the correction of the defects found."

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[1] The address will appear in full in the November issue of *Public Health*.

In pressing for the early construction of health centres "while the doctors are still in the mood," he evidently had in mind the kind of centre in which clinics would be prominent.

Whatever the M.O.H. has lost, there is no denying that his experience and his imagination are badly needed in the work that remains, where he has been given important new powers. Here Dr. Maurice Williams spoke particularly of the development of domiciliary nursing services (making more use of part-time married nurses) and the home care of the aged and infirm. Part of the function of the M.O.H. will be to teach people to use the medical services widely and unselfishly, and he must try to bridge the gap now existing between the hospital, the local authority, and the general practitioner. Unfortunately, in the N.H.S., "the maintenance of health has not been given the same consideration as the cure of disease. Yet the present national expenditure can be justified only on the basis that the essential aim of the service is to prevent illness." Dr. Brockington enlarges on this last theme when he shows how the power over medical resources has been given to the regional boards. The M.O.H. wanting the help of a pædiatrician or an obstetrician to develop *preventive* services must appeal for such help to a body which has no responsibility for prevention and can scarcely be blamed if it prefers to reserve its specialists for its own curative work. In deciding how resources should be allocated there is nobody in a region whose duty it is to take a balanced view of the community's needs, and nobody who can argue on equal terms with a board which thinks that hospitals are what matter in medicine. Dr. Brockington's solution of this problem may or may not be the right one; but some solution must certainly be found.

ANTIBIOTICS AND COAGULATION

ACCORDING to the *Manchester Guardian* (Oct. 15, p. 5) Dr. Alton Ochsner says there has been a serious rise in the thrombo-embolic complications of surgery since penicillin and other antibiotics have been used as a routine. He told the New Orleans meeting of the International Society of Surgery that at Tulane, where he is professor of surgery, there were as many cases in the two years after the introduction of penicillin as there had been in the preceding five years.

The possible danger of penicillin causing thrombosis has, of course, been pointed out before. In the early days of penicillin, when it was given by continuous intravenous-drip infusion, one of the most troublesome reactions was venous thrombosis. Intravascular clotting and in-vitro clotting of shed blood are not directly comparable, but investigations were made to see whether penicillin shortened the coagulation-time. Moldavsky and his co-workers[1] and Macht[2] found that it did (Moldavsky reported that the bleeding-time, which depends on a different mechanism, was also affected), but Lewis[3] and Ungar[4] could not confirm their findings. Estimations of coagulation-time are notoriously open to error and need repeated confirmation. These observations were inconclusive because not all the factors entering into the clotting mechanism were evaluated, and neither the methods of administration nor the doses of penicillin were standardised. Fleming and Fish,[5] on the other hand, came to the conclusion that locally applied sodium penicillin, in oral surgery, delays coagulation. More recently Weiner and others[6] administered large doses of penicillin intramuscularly and estimated the prothrombin-time of whole and diluted plasma, the coagulation-time, platelet-count, pla adhesiveness, and plasma [illegible] when the blood-penicillin [illegible] again when penicillin had disappeared from the blood the two sets of values did not differ significantly. Th was reassuring, but in the light of Ochsner's experien further work on the subject seems called for.

Reports on the effect of streptomycin on [illegible] coagulation have also been conflicting. Macht [illegible] in animals that streptomycin given parenterally [illegible] the coagulation-time. But, Farrington and his co workers[8] reported that in human subjects coagu time and prothrombin-time remained within limits; and this was confirmed by Elson[9] in a study tuberculous patients. The effect on blood-coag of the newer antibiotic, aureomycin, has been by Macht and Farkas.[10] In both man and anim prothrombin-time was unaltered, but in some subjec the clotting-time was appreciably reduced. This al needs watching, though hitherto patients receivin aureomycin have shown no signs of an increased liabilit to thrombo-embolic accidents. In theory the adminis tration of antibiotics by mouth might interfere wi blood-coagulation because they inhibit the growth intestinal organisms that synthesise vitamin K, and th vitamin is essential for the formation of prothromb and therefore for the coagulation of blood.

MYELOSCLEROSIS

MYELOSCLEROSIS is one of those rare conditions th entrap the unwary surgeon who removes large splee without submitting the patient to a thorough hæmato logical investigation. Briefly, what happens in th disease is that the bone-marrow undergoes a curiou fibrosis that slowly strangles the blood-forming element at the same time the spleen enlarges and blood formatio begins again in its embryonic site. But this blood forma tion in the spleen cannot keep pace with the needs of th adult body, so the patient develops a slowly worsenin anæmia; primitive white cells, even some myeloblast nucleated red cells, and sometimes megakaryocyte appear in the peripheral blood. The spleen become enormous, but if it is removed the sole remaining sit of blood formation goes, and the patient soon die Left alone, the patient may carry on, with diminishin efficiency and increasing discomfort, for some year The diagnosis depends on the blood picture, the failur to obtain any cellular bone-marrow by needling, an the radiological changes in the bones. The bloo picture is not characteristic, since the same pictur can occur in some forms of myeloid leukæmia, and some what similar changes can appear in all the variou diseases that cause leuco-erythroblastic anæmias. Punc ture of the sternum and iliac crest does not yield an cellular marrow; the final proof should be a trephin sample of sternal marrow and confirmation of the typic histological changes. Radiography sooner or later show narrowing, or even obliteration, of the marrow cavit in the long bones, especially in the femurs.

Unfortunately the findings are not always so clear-cu and in this issue Wood and Andrews describe 3 case that were much less typical. Differential diagnosi has given rise to much difficulty in the past, particularl between myelosclerosis and subleukæmic or aleukæmi forms of chronic myeloid leukæmia. In smears o normal bone-marrow, myeloblasts, monocytes, an lymphocytes are present only in small numbers; s whatever the picture in the peripheral blood, when th bone-marrow shows large numbers of these cells a diagnosi of leukæmia is almost certain. But in chronic myeloi leukæmia the cells involved are myelocytes, metamyelo [illegible] and the bone-marrow can sho

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1. Moldavsky, L. F., Hasselbrock, W. B., Cateno, C. *Science*, 1945, 102, 38.
2. Macht, D. I. *Ibid*, 1947, 105, 313.
3. Lewis, J. H. *Proc. Soc. exp. Biol., N.Y.* 1946, 63, 538.
4. Ungar, J. *Lancet*, 1945, ii, 614.
5. Fleming, A., Fish, E. W. *Brit. med. J.* 1947, ii, 242.
6. Weiner, M., Zeltmacher, K., Shapiro, S. *Exp. Med. Surg.* 1948, 6, 181.
7. [illegible] 1947, 74, 399.
8. [illegible] 1947, 134, 670.
9. [illegible] 217, 421.
10. Macht, D. I., Farkas, R. *Science*, 1949, 110, 305.

ority of these cells in many other conditions besides mia. The diagnosis of subleukæmic or aleukæmic ic myeloid leukæmia thus depends on the failure d any other cause for the enlarged spleen. the ely few (if any) immature cells in the peripheral and the demonstration of a cellular bone-marrow ps containing more early granulocytes—promyelo- and myelocytes—than usual. The presence of basophil granulocytes in the marrow is suggestive ıkæmia, and there is often a striking increase gakaryocytes in the marrow and spleen. This ion, or one very like it, is described in America the name "agnogenic myeloid metaplasia" [1] se of the granulocytic and megakaryocytic hyper- in sites other than the bone-marrow, again ularly in the spleen.

differential diagnosis between leukæmia and sclerosis may thus depend entirely on the bone- w findings—in leukæmia a cellular marrow with al numbers of granulocytes and megakaryocytes: elosclerosis a marrow almost devoid of cells argely replaced by fibrous tissue. Before bone- w biopsy became a standard technique the two ions were confused and consequently most of the its before about 1940 are not very helpful. With t knowledge the differential diagnosis can be made t cases, and this is not merely an academic exercise, e the newer sclerosing forms of treatment. like en mustards, may be useful in leukæmia but are ely dangerous in myelosclerosis.

A NEW CODEX

E are the days of the iconoclast who boasted that ld conduct his practice on a quarter of morphine catheter. The 20th century is a notable epoch of eutic development, and there never was a time offered greater opportunities or greater privileges hose now enjoyed by the practitioner of medicine. benefits, however, cannot be dissociated from sibilities. The essential preliminary to effective ent is accurate and comprehensive diagnosis; e pre-requisite of skilful prescribing is an intimate edge of the scope of well-established drugs. It t be said too often or too emphatically that well- ed physicians and surgeons seldom require to look d official and semi-official publications for thera- and diagnostic agents. It is incumbent on the l teachers to support their colleagues in the depart- of pharmacology and therapeutics by insisting on e of the official names for drugs, and on prescriptions test the student's knowledge of the principles of acology and the elements of pharmacy.

ention has been repeatedly drawn to the growing tance of the *National Formulary* as a practical to prescribing; but it does not offer the back- d information that all of us sometimes seek. medical practitioners find that the *British Pharma- a* meets their requirements; it is essentially a book erence for the pharmaceutical chemist and drug facturer. On the other hand, all can find much is of interest and of practical value in the *British naceutical Codex*, because facts about drugs and preparation are supplemented by concise state- s of therapeutic actions. The structure of the new n [2] is similar to that of its four predecessors, though e age of 42 years there is more than a hint of middle- pread. Nearly two-thirds of the 1500-odd pages levoted to general monographs which embrace all reparations and substances included in the *B.P.*; ot infrequently less space is devoted to preparation to action and uses, and there are lively descriptions ugs which are not official, such as tea, coffee, yeast, Irish moss, and lily-of-the-valley flowers. Let no highbrow pharmacologist in his laboratory despise these comforting and time-honoured remedies. Part 2 is concerned with antitoxic, antibacterial, and antiviral sera. This section is as readable and informative as any textbook on the subject; and the decision to separate it from the general monographs was wise. The wide appeal which the *Codex* undoubtedly makes is maintained by such lucid reviews which are not excessively technical. The same observation might be made on part 3, which discusses preparations of human blood. Any suspicion of atavism is dispelled by the inclusion among these invaluable substances of human fibrinogen and human thrombin. How many surgeons can explain the differences between a crêpe and a domette bandage? The information is readily available in the section on surgical ligatures and sutures. The pièce-de-résistance, however, is clearly the formulary. extending to upwards of 300 pages. Here elegant prescriptions abound. and every form of medicament is generously represented—creams. dusting-powders, elixirs, emulsions, capsules, linctuses, and injections, to mention only a few taken at random. It is true that their features are not extolled on blotting-paper, but their reliability and purity are guaranteed by the panel of distinguished pharmacists and physicians who have fought assiduously to attain the highest possible standard. Issued with the volume is a folder giving in alphabetical order the *Codex* names of preparations and their proprietary equivalents.

The Pharmaceutical Society, which has rendered such a signal service to the medical profession as well as to its own members by publishing the new edition of the *Codex*, would earn the gratitude of practising doctors by sending them a copy of this useful supplement.

HEMP

CANNABISM is the easiest choice for the addict. The varieties of *Cannabis sativa* grow readily in various climates: where the atmosphere is cold or temperate, the subsoil moist, and rain abundant, the plant grows soft fibres which can be sold for rope-making; but in a hot climate with a dry soil the plants are small and tough, and secrete more abundantly the resin which is marihuana—or bhang, hashish, kif, dagga, anascha, esrar, diamba, or maconha. The drug is commonly taken in cigarettes, usually made from the flowering tops, rich in resin, of the female plant; and, though it is cheap enough, the habit of adulterating drugs is so powerful among illicit traders that they cannot always resist putting in a mixture of other weeds, fortunately harmless.

Dr. Pablo Wolff, whose lecture delivered last year to the Sociedad de Medicina Legal y Toxicologia of Buenos Aires has now been translated,[1] attributes the spread of the drug in the Latin Americas largely to the ease with which it can be grown and distributed. A spreading centre of traffic in this drug is situated in the north and north-east of Brazil, where the cannabis plant grows wild. Users are among the poorer groups—natives, farm hands, packers, fishermen, sailors, and vagrants. Soldiers may also become addicts, and so may women, though in far smaller numbers than men. In Brazil, Mexico, and Cuba, marihuana parties may be held, sometimes as religious rites of secret societies, in which a convivial exhilaration among the guests at the start is apt to give place to hallucinatory excitement, uproar, strife, and exhausted sleep. This picture fits in with the findings of those scientists who have investigated the effects of marihuana either by clinical observation or personal trial. This drug reveals the subconscious tendencies of those affected, often in practical action of an aggressive or otherwise undesirable kind: and the

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: Levison, S. A., Limarzi, L. R. *Amer. J. clin. Path.* 1947, 17, 49.

British Pharmaceutical Codex 1949. London: Pharmaceutical Press. Pp. 25 + 1563. £3 3s.

1. Marihuana in Latin America. Washington, D.C.: Linacre Press. 1949. Pp. 56. $1.50. Translated from the Spanish Edition, "El Ateneo," 1948.

affected person may feel driven to do the thing he knows to be wrong, or at least powerless to prevent himself from doing it. When he recovers he may have forgotten the entire episode; Dr. Wolff records a particularly unhappy case of a youth of nineteen, pleasant and of good character, who under the influence of the drug killed five of his family, and afterwards only remembered a terrible dream. Other cases are recorded of soldiers or policemen shooting people without warning or provocation. The drug, he believes, also predisposes to sexual offences; and it may be taken deliberately by criminals to nerve themselves for a murder, assault, or other crime: indeed, the word "assassin" derives from "hashish." It is only fair to recall, however, that some other authorities—notably Bromberg [2]—are sceptical of these grave effects. Bromberg asserts that in 67 criminals with marihuana addiction he found no positive evidence of a relation between this drug and sexual or violent crimes; but Wolff holds that the grounds on which he made this judgment were inadequate. Dr. J. D. Fraser's paper in our present issue shows that irritability culminating in violence may develop when the addict is deprived of his drug.

Wolff reports that the secret cultivation of hemp flourishes in Mexico, which boasts a plant particularly rich in resin. Hemp was introduced into Cuba 30 years ago by Portuguese sailors; and by 1946 70–80% of the drug-addicts there were users of marihuana. Cuban attempts to suppress the trade are at present feeble. In Colombia, however, stricter legislation is being passed as a result of an alarming spread of addiction in the cities. The use of the drug is so far limited in Ecuador, but is spreading in Central America, and is established in the countries of the Carribean. Argentina is for the most part free of this form of addiction, only a few cases having been reported; the Argentina police, moreover, have been active in suppressing every attempt to introduce hemp. Wolff mentions the spread, during the past 15 years, of marihuana addiction in the United States. His concern at the general picture must be generally shared, for this drug destroys the addict's relation to society and makes him a member of a special class of vicious and delinquent characters. There are more ways of killing a man with hemp than by hanging him.

PITUITARY, ADRENALS, AND RHEUMATOID ARTHRITIS

On July 23 we discussed Hench's fundamental work on the action of 'Cortisone' and anterior-pituitary adrenocorticotropic hormone (A.C.T.H.) on rheumatoid arthritis and rheumatic fever. A paper in the *Practitioner* by Thorn and Bayles,[3] of Harvard, carries the work of the Mayo Clinic investigators a stage further.

It had previously been shown by Thorn, Prunty, and Hills [4] that four hours after a dose of 25 mg. of A.C.T.H. the number of circulating eosinophils is much reduced in a normal person but not in a patient with Addison's disease. This provides a sensitive test of the efficiency of adrenal cortical function; but it is possible to go physiologically a stage further back: if 0·3 mg. adrenaline is given subcutaneously, there is also a fall in eosinophils, the mechanism of this being

$$\begin{tikzcd} \text{adrenaline} \arrow[d] & & \\ \text{hypothalamus} \arrow[r] & \text{anterior pituitary} \arrow[r, "\text{A.C.T.H.}"] & \text{adrenal cortex} \end{tikzcd}$$

So while a positive A.C.T.H. test merely means an intact adrenal mechanism, a positive adrenaline response means that the whole hypothalamic-pituitary-adrenal system is working adequately. These tests have now been performed on a number of patients with rheumatoid arthritis, and nine out of ten gave a normal response to A.C.T.H. The response to adrenaline, though usually positive, was more variable, and some rheumatoid patients gav a positive A.C.T.H. response with a negative [illegible] effect: whether this is fortuitous, or due to a deficiency in the hypothalamic-pituitary link is not discussed

A.C.T.H. was then given for long periods to the t rheumatoid patients in amounts of 40 mg. per day divided doses: in nine cases the same dramatic improv ment as was described by Hench et al.[5] was observ while, as might perhaps be expected, the tenth patient, w had given a negative response to the test dose of A.C.T. did not respond at all to the treatment. In view of t shortage of A.C.T.H. and cortisone, attempts were ma to increase pituitary-adrenal stimulation less direct Adrenaline was tried in doses of 0·3 mg. six-hourly f fourteen days in two cases of rheumatoid [illegible] a slight, but definite improvement was observed, b much less than that obtained with A.C.T.H. or cortiso Evidence of cortical stimulation by the adrenaline w provided by the sustained fall in eosinophils and inc in urinary ketosteroids, but apparently this increase w insufficient quantitatively to be of real therapeutic val In rheumatic fever A.C.T.H. gave results as good as the obtained by Hench with cortisone. Equal benefit w observed in one case of disseminated lupus erythem tosus, and in gout: it is known that A.C.T.H. increa the output of uric acid, but the effects on the arthr were much greater than would be expected from t increased urate excretion, suggesting that here t there is a specific action on the joint tissues.

As regards the mechanism by which cortisone wor —either when it is administered as itself, or when it produced in response to A.C.T.H.—Thorn and Bayl do not express a definite opinion. As we have alrea remarked, it seems improbable that cortisone thera is merely replacement therapy. Thorn and Bayl point out that while 10–20 mg. of cortisone daily suffi for maintenance of a patient with complete adre insufficiency, 100 mg. a day is required to prod significant changes in the course of rheumatic dise and they state that "effective therapy is only attain when the level of hormone is clearly increased, eith from subnormal to above normal, or from normal above normal." The possible dangers of continu treatment with A.C.T.H. and cortisone are discussed A.C.T.H. has effects resembling those of desoxycort costerone [6] and long-continued A.C.T.H. therapy ma lead to persistent adrenal hyperplasia with the sympton of Cushing's syndrome. With the 40 mg. a day used b Thorn and Bayles, however, there has always be a rapid return to normal, or subnormal, levels of adre activity—the latter effect being perhaps due to suppre sion of the normal anterior-pituitary action by th exogenous A.C.T.H. In contrast, administration of cort sone may lead to atrophy of both pituitary and adrena and withdrawal symptoms may be severe: it is suggeste that this effect could be minimised by the use of A.C.T. for 24–28 hours after cessation of therapy with cortison

Unfortunately, the supply of A.C.T.H., which depe on the amount of pituitary glands available, is as limit as that of cortisone; and unlike the latter, which ma eventually be produced in adequate quantities b synthetic methods, it is likely to be always scarce. As w pointed out in the discussion reported on p. 749, th importance of Hench's work lies in the opening of a ne line of approach to the problems of rheumatism, eve more than in the discovery of a powerful therapeutic agen

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The Nobel peace prize for 1949 has been awarded t Lord Boyd-Orr, M.D., F.R.S., formerly director-general o the United Nations Food and Agriculture Organisatio

Lord Nathan of Churt has been appointed a Crow representative on the General Medical Council.

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2. Bromberg, W. *J. Amer. med. Ass.* 1939, 113, 4; and see *Lancet*, 1939, ii, 567.
3. Thorn, G. W., Bayles, T. B. *Practitioner*, October, 1949, p. 365.
4. Thorn, G. W., Prunty, F. T. G., Hills, A. G. *J. Amer. med. Ass.* 1948, 137, 1005.
5. Hench, P. S., Kendall, E. C., Slocumb, C. H., Polley, H. F. *Proc. Mayo Clin.* 1948, 28, 181; *Ann. rheum. Dis.* 1948, 8, 9
6. Prunty, F. T. G., Forsham, P. H., Thorn, G. W. *Clin* Sc 1948, 7, 109.

Public Health

HE DIFFICULTIES OF PUBLIC HEALTH

PAST, PRESENT, AND FUTURE

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UBLIC health is an abstract idea; it has not the nour or drama of disease. The newspapers can a column with an account of the saving of life by eminent surgeon or physician called as a last hope by raught parents to the bedside of their child, or h a description of some novel operation on the heart brain. In contrast there is little news value in the ivities of public health; what is there to say about epidemic of typhoid fever that never occurred? blic health is a commercial proposition, yet it is only ely possible to demonstrate a cash return, or even to gest the existence of one: we cannot often point mpty fever hospitals, once filled with children suffering m diphtheria, whose annual costs of maintenance and ffing can be computed.

The idea that society as a corporate whole is just as ch in need of doctoring as any of its individual nponents has been slow to grow. Frank, in Bavaria, iting about 1780, recommended that a benevolent tator should take a wide range of action on the health nt; but though he wrote at great length during a g life, examining in minute detail the application of doctrine of "police medicine" to every aspect of , it is doubtful whether anyone in England read his rks. We in England preferred to attack the problems they arose or as we began to understand them, and to ve to other peoples the enforcement of entirely oretical ideas before they had been understood and epted. The Englishman's mind moves empirically; does not like to take, on theory alone, more than a all and hesitant step, and even this it prefers to leave some voluntary body. A long time has been needed prove in practice the economic, spiritual, and moral lues of schemes to safeguard the public health.

This piecemeal approach to the health of society s had a profound influence on the course of events in blic health. From the time in 1796 when Dr. Percival fired the minds of his fellow inhabitants of the city of anchester about the conditions in the cotton mills at they agreed to the establishment of a Voluntary ard of Health, right through the Industrial Revolution it darkened and worsened, action to achieve a healthy [illegible] was always taken on a narrow front. The [illegible] deal with an established evil have been given [illegible] ent to whatever body, central or local, seemed st fitted at the moment to wield them. There never as been a unified approach to the health of the community in any way comparable to our approach to the ealth of the individual. Whereas most people have ng agreed that it is best to have one doctor who can e you as an entire unit and can understand your roblems in relation to your whole life, the community as had to have its organs studied and treated separately.

Thus medical officers of health, first appointed in 847 to Liverpool, in 1848 to London, and in 1872 to the hole country, have never been given the whole field f work to tackle. As creatures of statute they have one what Parliament authorised them to do, and no more. Under the terms of the Sanitary Officers (Outside London) Regulations, 1935, the medical officer of health of a county has been given a function wide enough to capture the imagination of the most zealous ("he shall inform himself as far as practicable respecting all matters affecting or likely to affect the public health in the county"); but this does not enable him, or his authority, to play any real part in the services which are outside his statutory orbit. Some of public health, like the poor-law and factory health work, remained in the hands of central government departments for a hundred years; industrial medicine is still quite divorced from the rest of public health. Furthermore, owing to the growth of local government, public health as carried out by local authorities has been segmented; in counties—i.e., the whole of England outside the cities—it has been divided quite unnaturally between county districts and the county council, creating difficulties which schemes of "divisional administration" have helped to overcome.

The vast possibilities of public health were so little understood that Parliament failed at first to insist that medical men who took up such work must be whole-time. Contrary to the wishes of the Royal Commission on Local Government (1868), 70% of the medical officers of health appointed after 1872 were part-time in general practice, and of the 700 holding office today approximately 150 still remain so. Despite this faulty beginning, much of our success in England has resulted from the early development of a specialist qualification in public health. Soon after its creation in 1858 the General Medical Council was required to provide a special qualification in sanitary science, and in 1871 and 1875 Dublin and Cambridge offered diplomas—the first of all the specialist qualifications—for medical graduates seeking to take up such work. To hold such a diploma became obligatory for all except the small county districts after 1888. In this way the medical officer of health was trained "to become the voice of the community in which he was to be a leader and to urge at all times and in all possible ways that man should no longer be crippled by malnutrition, by slum dwellings, by lack of medical care, by social insecurity, and by disorders of personality." One of his most effective means of spreading these ideas has always been the duty imposed upon him, in 1870, to write an annual report of his work.

In recent years the development of public health has been affected by what may be called "the obsolescence of local government." When in 1939 Newman exulted in the greatness and success of local government, which after a century had gathered into its fold the poor-law administration and the duty of administering municipal hospitals, he failed to give due emphasis to the growing dissatisfaction with this form of government. The war seemed to bring this dissatisfaction to a head, and when peace came again it was evident that most people had lost confidence in the structure and saw little chance of executing the radical boundary alterations needed to establish units of administration capable of handling modern services. When the National Health Service was first suggested many said that the reorganisation of local government should be undertaken forthwith, so as to build the new service on new economic units. The Minister of Health said that this would be too long a process—a decision to some extent borne out by the subsequent inquiries of the Boundary Commission—and new machinery has been created, by-passing local government. Public health, being tied to local government, has had to suffer the nation's diminishing belief in local government.

To add to all these difficulties, and possibly transcending them, has been the continued opposition of the medical profession. In our teaching hospitals medical teaching has concentrated on the individual amidst all the paraphernalia of treating sickness; the student has gone from the bedside to the microscope or to the post-mortem room, but seldom out into the community itself. For a hundred years the medical officer of health has had to meet opposition and misunderstanding which has had its roots in teaching during the years of walking the wards, and he has himself been denied the new weapons and new disciplines which the universities and medical schools might have produced if their interest had been in the direction of public health. General practitioners have always resented the "interference" of local authorities in the free exercise of their work; the duty of making returns and notifications has been irksome and the services for school health and maternity and child welfare have seemed to come between them and their patients. The local authorities were almost the first contact which the general practitioner had with the "State" and he didn't like it.

DEVELOPMENT IN ISOLATION FROM CURATIVE MEDICINE

Sanitation and bad physical environment as causes of ill health were the first of the evil influences to be recognised and to become the basis of action by the State. The reason for this is to be found, not in any profound knowledge of medicine, but rather in our ignorance of it; for, since the days of the Greeks, putrifying stenches, or miasmas, have been regarded as the cause of plagues and pestilences. When in 1848 Simon was appointed to be the first medical officer of health of the City of London, bacteria had not yet been accepted as the cause of disease; yet he had little difficulty in convincing people of the iniquities of what he called "the pestilential heapings of human beings." If stenches were the cause of ill health, then there was reason enough in any London slum to assail the nostrils of anyone who cared to take a stroll among them: "what perambulations have I taken today in company with Dr. Southwood Smith," wrote Lord Shaftesbury in his diary for 1842; "what scenes of filth, discomfort and disease."

Thus public health began with its emphasis on environment in the sense of sanitation and infectious disease. These were the pressing problems of a hundred years ago. Duncan records that in the cholera epidemic in Liverpool in the early 1850s the dead were too numerous to bury. It is one of the very strange happenings of public health that the discovery of germs as the cause of infection did little to upset the fifty years' work which preceded that knowledge.

It was some time before public health began to widen the meaning of environment to include the personal habits of the individual and to add to its methods the detection of early disease. To understand that filthy slums can engender disease (even when the basis of the understanding is wrong) is not hard; but who could immediately grasp the advantages of house-to-house visitation to teach mothers how to care for babies? It took a long time to win general support for the work of a nurse as a health visitor; three-quarters of a century or more was to pass before the nation took the first positive step from a belief in the responsibility of the environment as a cause of ill health (something that only the State could remedy) towards an understanding of the equal responsibility of the individual which depended on a way of life within his own control. It has taken still longer to begin other work along similar lines, such as the preventive health work in relation to mental deficiency, lunacy, and venereal disease. It may yet be another hundred years before the possibilities of public health through individual teaching by skilled personnel have been fully exploited.

The 20th century has hitherto been devoted mainly to the development of personal health services to supplement the environmental health services of the 19th century. This second period of public health has resulted in services with which everyone is familiar—the maternity and child-welfare service, the tuberculosis service, the venereal-diseases service, and the school health service. At the root of all these services there are the ideas of detecting disease early enough to make treatment a preventive measure and of influencing susceptible individuals by bringing them into contact with personnel of preventive medicine. No service illustrate this better than the school health servi where teacher, doctor, and nurse can singly and joint bring their influences to bear on parent and child.

One of the great advances of this second period public health has been the development of health education, coupled with a greater understanding of the soc aspects of disease. Fifty years ago we laid stress the importance of pure water-supplies; today we con sider the unclean cook as dangerous as unclean wat The kitchen worker who infects food from fingers soil with fæces, or from the nose, can be as much a mena as the shallow well or the contaminated river wate supply. So also we taught fifty years ago, and s quite rightly teach today, that bad housing sprea tuberculosis; back-to-back houses can be shown to ha high incidences and death-rates from tubercul because of their poor ventilation and high concentrati of tuberculosis germs when the household includes open case of phthisis. But now we think it equal important to emphasise the personal responsibili of the individual sufferer; for we know that wi scrupulous personal hygiene even an open case need transmit his infection. In Papworth, where famili live with the infected father and mother, the infecti of children has been shown to be less than in the norm community.

The modern approach to health increasingly stress personal responsibility, and to this end health educati should include a knowledge of germs and how they spread, of physiology and how to apply it, and of biolo in its importance to the welfare of man.

FORMATION OF LINKS WITH CURATIVE MEDICINE

We may recognise, therefore, two periods of publ health—the first almost wholly environmental, t second environment and personal. There is also a thir During its first two periods public health developed almost complete isolation from curative medicin The third is the period when the weapons of curati medicine have been called more and more into the servi of preventive medicine: when the children's specialis perhaps a little reluctantly, has left his children's be to devote some of his time to the problems of the scho health and child-welfare services; when the orthopædi surgeons have wanted to go further back to see whethe their special knowledge and skill could not be of hel in preventing deformities; when the consultant obste trician has considered how to make his beds for materna abnormalities redundant. All hospital specialists hav much to give to preventive medicine, and there has been movement in this direction. This is the time of special diag nostic clinics—the clinic where the cases of handicappe children can be reviewed by the children's specialis so that parents and education authorities can be advi-e on the fullest knowledge available; the clinic for chil guidance, with the psychiatrist and educational psycho logist working together; the clinics for orthodontic for difficult problems of expectant mothers, and fo various disorders. Such special diagnostic clinics hav been valuable in combating venereal disease and tuber culosis. As we seek to tackle the degenerative disease they will be invaluable for the early detection of cancer arteriosclerosis, and diabetes.

As part of this same effort to harness curative medicin to preventive medicine, arrangements have been made fo doctors (and other personnel working in the preventiv field) to spend part of their time in hospitals; and equally important, the patient leaving hospital is bein handed over to the care of the health authority for after care when this is needed. The time when the hospital regarded itself as something apart from the life of the community is passing: it would be a matter of surprise if a weakly baby were to be discharged without ry as to unsatisfactory home conditions; yet only years ago it would have been thought unusual to any such inquiry, and many a baby has gone from oving care of a maternity home or hospital to die hovel. With the passage of the Education Act of hospitals began to supply school authorities with mation about children admitted. This made ble a new service of care and aftercare and enabled l health records to be complete in essential culars.

EASING COMPLEXITY OF PUBLIC-HEALTH PROBLEMS

blic health slowly commits suicide; for, as it is ssful, it progressively removes the reason for its being. But although society today is vastly different what it was when public health began, there is as no lack of work; all that has so far happened has ted only in a widening horizon and a shifting hasis.

blic health has changed society: it has changed its onstitution; it has abolished, speaking very broadly, tious disease; and it has removed the more obvious es of ill health and death. This has had a profound t on the practice of public health itself, which is increasingly concerned with the degenerative ases of middle life and late years, and with the of the aged. In England at least, the main battles nst the pandemic infections, such as smallpox ue, and cholera, have been won; and despite the ged resistance of their rearguard, chiefly the virus ctions of poliomyelitis and influenza, infections of orts are now fighting a losing war against an improv- environment, increasing education, and the weapons he laboratory. Even in the past fifty years tuber- sis has fallen from the position of chief killer with eath-rate of 190 per 100,000 to that of fourth on the with a death-rate of 55 per 100,000; pneumonia, ich in 1900 had a death-rate of 137, now takes a toll of ; diphtheria and scarlet fever have virtually ceased killing diseases.

But what is left of ill health and disease is generally re obscure and less easy to remedy. As an example, en Booth wrote in 1900 of the poor of London, and wntree of the conditions of York, these two sociologists ked about a "submerged tenth" of the population. fifty years this submerged tenth has disappeared and a mere 80,000 "problem families." But whereas main bulk of the submerged tenth was biologically nplete, and only awaiting, so to speak, the inspiration assistance of social services to raise themselves from pond to decent modes of life, the same cannot be said problem families, who, being biologically incomplete, not raise themselves unaided. Public health for e problem families will be much more difficult than ucing the infant mortality from 150 to 38.

It is because the residual problems of public health come more difficult that it becomes increasingly portant to secure that all types of medical specialist all give time and thought to preventive problems.

BENEFITS FROM THE ACT

What then has been the effect on public health of the ational Health Service Act, 1946, the greatest medical atute since the Act of 1858 which created the General edical Council and State registration of doctors? s third part enumerates the duties of a preventive haracter placed on the local health authorities. They ust, it says, provide a comprehensive ambulance rvice, carry out vaccination and immunisation, and uild health centres. They must also provide health itors and home nurses who, with home helps, should gain enable the general practitioner to undertake the are of many patients whom he now sends to hospital and who would be better nursed at home. It will take many years to build health centres if the cost of the first London centre (£186,000) is any guide; but when they do come about they may develop into centres of preventive medicine where adequate records and routine health checks become routine procedure; they are intended to combine the work of general practitioners with that of local-authority health clinics and at some time in the future they will become the focus of medicine. One omnibus section of the Act makes the authority responsible for preventing illness and for care and after-care—all these services are capable of great extension.

The removal of many responsibilities directly related to curative medicine is a substantial advantage to public health: the relief from executive charge of hospitals will give the medical officer of health more time to tackle the many aspects of public health which need closer attention. The tracing of tuberculosis contacts is an obvious example, for few can feel satisfied that our knowledge of the epidemiology of the disease has so far been put to the best advantage. In an ageing community the medical officer of health must play an increasingly important part in the welfare of the aged, surveying his area by means of his health visitors, home nurses, and sanitary inspectors, and seeking to remedy the appalling state into which many old people fall. The allied problem of home care of the chronic sick will also need his attention if we are to avoid big increases in hospital beds. With the conquest of infectious disease the emphasis of public health must inevitably shift towards the higher age-groups where the degenerative diseases, diabetes, cancer, arteriosclerosis, call for the same measure of interest as medical officers of health have in the past given to the acute infections of childhood and early adult life. This does not mean that the traditional fields of work in public health are no longer capable of occupying his time; in some at least—e.g., in the more intensive attack on infant mortality—the opportunities are expanding as our knowledge grows. Much can be done to prevent the infections of early life, prematurity, and no doubt many rarer infant disorders. And there are new opportunities for working with general practitioners for the care and aftercare of the patient at home.

Part III of the Act can, in fact, be regarded as a minor charter in public health. Had it been passed into law without the rest of the Act the world of public health might have acclaimed it without reservation. Nevertheless some unfortunate disadvantages arise from the new administrative structure.

FOCUS ON HOSPITALS

By its creation of separate authorities to handle treatment, largely under State control, the Act has placed a new emphasis on curative medicine. The work of hospitals and specialists has been put under the jurisdiction of 14 large regional hospital boards; and in the hands of these boards is now the virtual control of the development of medicine. The boards are non-elected, and of the members selected by the Minister about a third are doctors, almost all of whom come from the world of curative medicine. The boards are not charged with any duties to prevent disease, and they are certainly not constituted to show any natural interest in public health. A physician who tends the sick thinks in terms of the individual; public health thinks in terms of the community. This would have no great significance were it possible to separate curative and preventive medicine. But the separation is impossible.

In the latest phase of public health there has been an increasing use of the facilities of curative medicine—notably by the employment of hospital specialists within the preventive field, by the establishment of special diagnostic clinics, and by the use of institutions in support of preventive services. Preventive medicine had begun to harness curative medicine to serve its own *great ideal.* This may still be possible, but there is no denying that it has become vastly more difficult. In all his plans for health, from those designed for the care of premature babies delivered at home to those which may seek to reduce the degenerative diseases of the aged, the health officer is now dependent on another authority to provide either special beds, or special case-finding clinics, or special medical personnel to visit in the home.

Here, therefore, lies the difficulty for public health; to do its best work for the community it must have an equal right to certain of the assets of the regional hospital boards; it must have a voice in the use to which many institutions and specialists are put; and it no longer has such a voice.

Furthermore, public health was centring thought upon a healthy community of happy families; in this picture the hospital was regarded as a necessary evil to be done away with as soon as possible, and as a bad psychological influence, especially for children. All institutions were regarded as no more than part of the machinery with which to support the community life: maternity homes for those who cannot have a baby where a baby should be born—at home; sanatoria to take those men and women whose condition makes them a source of danger to the community. As an example, school health was centred on the school; eye-testing, dentistry, and diagnosis were presented to the children not as hospital events but as part of the normal process of keeping healthy and to be related to the teaching of positive health and hygiene in the schools. Today health services are being increasingly focused again on treatment and on the hospital. The school dental service is already giving ground before the onslaught of adult caries; the school ophthalmic service becomes a concern of the hospital; there is imminent danger that once again diagnosis may become associated with the outpatient department, and that pædiatricians, obstetricians, psychiatrists, and the whole world of specialist medicine may once again be absorbed into the hospital wards.

REGIONAL BOARDS OF HEALTH?

It is certain that an emphasis on health and on the community, and the full application of medical knowledge to the ills of society, will be harder to achieve within an administrative framework which has established large, powerful, State-supported boards to manage hospitals and specialists, and which leaves the management of health to the now relatively small authorities of local government deprived of many of their weapons. The regionalisation of curative medicine has swung the balance of power so violently towards curative medicine that many believe a similar regionalisation of public health to be the only means of solving the new problems with which it is faced.

Such a step would have serious implications. Local government, with its many gradations of size and variations in autonomy, has ministered well to the Englishman's aptitude for experiment, his desire for trial and error, and his empirical mind, particularly in the public-health field. Few can doubt that preventive medicine in England has reached its present high state of development mainly because authorities guided by medical men with a specialist training in preventive medicine—thinking and planning for the needs of society—have been financed by a local rate and have therefore been able to take the initiative. Today it is more than ever necessary that the specialist in community health shall be given a free hand to develop his art.

Another obstacle which will have to be overcome, if public health is separated from local government as we now know it, arises from its close relation with other social services, such as housing and No doubt these difficulties could be met by the necessary public-health advice to local under a scheme of divisional administration. greater difficulty would be encountered in the s health service, which is an integral part of the educ service; but even this difficulty could be over The school health service must remain part of the system, and it would be necessary to resist strongl suggestion that some inspection, somewhere else a some other manner, could be substituted for it. would be attended by grave disadvantages; the g of *School and Life*[1] is I believe irrefutable— teacher, school nurse, school doctor, school child, parent in conclave, if necessary, together. Accord the work must be done on school premises, in school and by school doctors who give their time without commitments. Special schools for delicate, deaf, and other handicapped children should remain wit education committee. With this principle securely the school health service could be retained as an int part of public health, from which it has so much to and could be regionalised with the rest of public he

Some will say that the remaining health func should be transferred to the regional boards. Bu outlook of the clinician, who occupies more than a of the seats on the boards, is centred upon the indivi even when he is imbued with the new spirit of medicine. The outlook of the medical officer of h centres upon society. If then local government in he after a glorious reign, is now to be deposed, let no throne be occupied by those who know not. Let be a complete recasting of the administrative fr work. If this is to be centred on regional areas, let be new authorities, locally elected and with the inc able advantage of a local rate, and let them have a me officer of health with equal power to speak his mi official reports and in public writing and with dutie responsibilities in no way subordinated to curative med

Such an arrangement would have to meet the cri that there would be two separate authorities dealing medical matters in each region. It is impossib deny the force of the argument that the health ser demand a unified administration if they are to b economic proposition, and it is a fair inference that unification is now possible only at regional level. N theless, there are powerful reasons why the pr regional boards are not suitable organs for such a u control. Chief among these is the fact that reg boards are chiefly concerned with the cure of sick in hospital; if, with their present constitution, were to absorb the preventive services it is likely public health would suffer.

TOMORROW

The only type of hospital which has so far been almost wholly redundant—the first I hope of ma is the fever hospital, the creation of the medical o of health. As we work we continually remove causes for our own employment and that of the auxili of our own creation. But to argue that the me officer of health is no longer needed is blind complac It presumes that society could not retrogress, as it that society is now so perfect that it cannot adv This is nonsense. There are plagues enough still wit What of the degenerative diseases—*cancer*, art sclerosis, diabetes—which take an *increasing* Old age has still to be made a healthy, happy, useful period of life. What of the hospitals themse and the crowded outpatient departments? What of and the infants who still die uselessly *to the shame of* a mo society? What of the problem families and the hom

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1. Report to the Minister of Education by the Central Adv Council for Education (England). H.M. Stationery Office,

ren, and the smoke and slums which still mock our ts to create a healthy community of healthy families? me time the day will dawn when society no longer s the medical officer of health, but until that day s it behoves this country to fight for his preservation free agent. To give him his proper place in the new r of things he must be accorded specialist status, his training must be of the same order as that of the ee specialists under the Spens report: five years spent following graduation, included a year's diploma cial medicine, equipped with the new disciplines ated by Crew and others, and expanded to cover the e of man's ills as outlined by Ryle: a year to be t in some special study related to social medicine. n a department of physiology or an institute of itional research; a year to be spent in an executive rtment of public health: and a year in study ad.

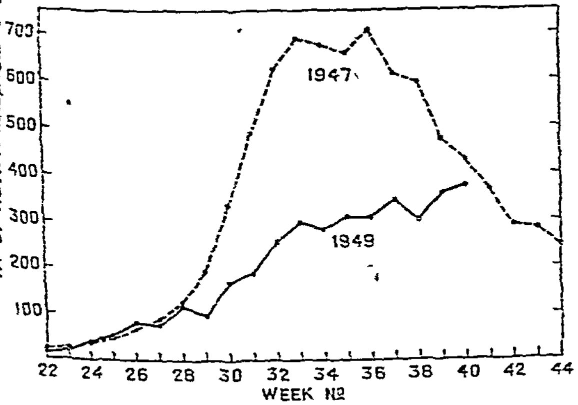
trust that the ideal of "public health" will be erved and not lost in a glorification of curative icine. With its help England might yet progress society as far removed from that of today as ours is rent from the time when Southwood Smith and Lord ftesbury walked together in the slums of Bethnal en.

Vaccination Reminders

n Canterbury all parents receive a notice about cination as soon as their child's birth is notified. s contains a short explanation of the reasons for cination at about 3 months, and the parents are asked fill in and sign either the brief request form addressed their own doctor or the attached postcard requesting M.O.H. to arrange for vaccination at the immunisation tre. A further notice, headed "A Second Thought on ccination," is sent if the child is still unvaccinated en 3 months old.

Poliomyelitis

During the week ended Oct. 8 notifications in England d Wales were: poliomyelitis 340 (331), polio- cephalitis 34 (26). High prevalence is being prolonged s year beyond the usual time, and first cases this r were reported from Anglesey and Radnor.



The following counties reported multiple cases (polio- myelitis and polioencephalitis together): London 52 (44), Bedford 5 (5), Berkshire 6 (5), Buckingham 2 (2), Cambridge 3 (0), Chester 5 (4), Cornwall 2 (8), Devon 3 (1), Dorset 7 (5), Durham 2 (3), Essex 31 (26), Gloucester 23 (17), Hertford 4 (12), Kent 26 (19), Lancaster 24 (41), Leicester 4 (2), Lincs, Lindsey 6 (8), Middlesex 30 (18), Norfolk 1 (4), Northampton 4 (4), Northumberland 6 (0), Nottingham 8 (9), Salop 2 (0), Somerset 6 (6), Southampton 4 (7), Suffolk, East 4 (2), Surrey 9 (9), Sussex, East 2 (5), Warwick 19 (13), Westmorland 2 (0), Wiltshire 4 (8), Yorks, East Riding 2 (3), Yorks, North Riding 3 (2), Yorks, West Riding 50 (38), Glamorgan 7 (6).

Special Articles

WORLD MEDICAL ASSOCIATION

MEETING IN LONDON

MEDICAL ethics, postgraduate education, and social security were among the chief topics discussed at the three-day meeting of the general assembly of the World Medical Association in London last week. Delegates from the following member countries attended: Australia, Austria, Belgium, Canada, Colombia, Cuba, Denmark, Eire, Finland, France, Great Britain, Greece, Iceland, India, Italy, Luxembourg, Netherlands, Norway, Pakistan, Peru, Philippines, Portugal, South Africa, Spain, Sweden, Switzerland, Turkey, and the U.S.A.

The election of Dr. CHARLES HILL as president for 1949–50 was unanimously confirmed, and he was inducted by Prof. EUGÈNE MARQUIS, the retiring president.

Membership of the association is open to national organisations of doctors, and the assembly admitted two new members—the Asociacion Medica Nacional (Panama) and the Colegio Medico de el Salvador.

FINANCE

Dr. O. LEUCH (Switzerland), the treasurer, announced that the council had decided that for next year members in the sterling area should pay their annual subscriptions at the same level in their own currency as if there had been no devaluation. It was not possible to recommend any reduction of annual subscriptions, for the regular income from subscriptions amounted to less than one-tenth of the expenditure of the United States committee, and income from this source had been guaranteed only until 1952.

The United States committee raises funds for the running expenses of the W.M.A., financial contributions being made to it by medical organisations and other bodies, and by individuals; of the $54,419 contributed to the committee in the first half of this year, $12,000 came from individual doctors in the U.S.A.—an indication of the interest taken by them in the world organisation. The assembly passed a unanimous vote of thanks to the United States committee, the American Medical Association, and the American doctors who had contributed to the association.

COUNCIL'S REPORT

In presenting the report of council, Dr. T. C. ROUTLEY, its chairman, explained that the association did not direct national associations as to what they should do, but sent to them all available information. On the position of refugee doctors, Dr. Routley said these had been accepted by two countries.

The council was unable to see that any useful purpose would be served by affiliation to the World Union of Medical Science. In regard to UNESCO, the World Health Organisation, and similar bodies, however, the W.M.A. was "what electric power is to transmission lines." Dr. Routley said that in proposing a conference on the coordination of scientific medical organisations, the council had no desire to overlap with UNESCO, with whom relations were cordial. The assembly agreed to this recommendation by council, and also to inquiries into pharmaceutical practices and hospitals. The assembly also approved a suggestion from Dr. O. RASMUSSEN (Denmark) that the supplementary investigation into the status of the medical profession should include a study of its economic status and a comparison with that of other professional people.

Though the association has been in existence for three years, until now it has had no emblem of its own. This was rectified by the assembly, which approved an emblem in blue and white, consisting of a globe with staff and serpent superimposed at an angle.

REGIONAL REPORTS

The report of Dr. S. C. SEN (India), assistant secretary for Asia, referred to the agitation for recognition by practitioners of such indigenous systems of medicine as Ayurveda and Unani. It was to be hoped that ultimately all medical practitioners would possess the same basic qualifications; but at present, because of the shortage of money and medical personnel, the government felt inclined to use the services of these other classes of practitioners.

Dr. PAUL CIBRIE, assistant secretary for Europe, reported that the council had approved a questionary to be sent to all medical associations for the purpose of inquiring into the peace-time activities of the Red Cross, some of which, it was felt, infringed on the medical profession at large and should be opposed.

MEDICAL ETHICS

The main discussion at the first day of the assembly was on the proposed code of medical ethics, drawn up by a committee presided over by Dr. Cibrie and intended as an amplification of the Declaration of Geneva—the new version of the Hippocratic Oath adopted last year.

Dr. P. MORAN (Eire) objected to the first paragraph under "Duties of Doctors to the Sick":

> "A doctor must always bear in mind the importance of preserving human life from the time of conception. Therapeutic abortion may only be performed if the conscience of the doctor and the national laws permit."

Dr. Moran moved to leave out the last sentence, declaring it to be an abrogation of the fifth commandment.

Dr. CIBRIE pointed out that only very severe conditions would permit of therapeutic abortion. Should any country feel that this sentence should be struck out the W.M.A. would not object.

Dr. F. SONDERVORST (Belgium) thought it unwise to include this sentence in a code of ethics; a physician might get behind the article to procure abortions.

Dr. J. A. PRIDHAM said that murder could be committed by action-deed or by action-omission. "If a doctor is certain, and his colleagues are certain," said Dr. Pridham, "that the mother will die unless the pregnancy is ended, and he allows that pregnancy to go on, might he not be thought to have committed murder?"

Dr. L. LLEWELLIN DAVEY (Australia) felt that the sentence was badly worded. He would substitute the words: "Therapeutic abortion may only be performed if the welfare of the mother demands it." That would have to be decided in consultation with other doctors.

Prof. K. FELLINGER (Austria) held that the purpose of a code of ethics was to declare principles, and if an exception was made the principle was weakened. Dr. L. DE CAMPOS (Portugal) thought that to base a code of ethics on national laws was very dangerous for the profession and for the individual physician. Dr. MORAN said that in so-called "therapeutic" abortion the doctor took active steps to kill, whereas if the pregnancy were allowed to proceed the mother might recover. He thought that the very thing they wanted to avoid was that the mother should decide.

The amendment was defeated by 22 votes to 19, but it was decided that since the margin was so narrow a small committee should be set up to find an acceptable common formula. The effect of the committee's recommendation, agreed to next day by the assembly, was to drop the controversial sentence, substituting for the whole paragraph the words:

> "A doctor must always bear in mind the importance of preserving human life from conception until death."

The code of ethics, as amended and adopted by assembly, lays down that the doctor must always tain the highest standards of professional conduct. must not allow himself to be influenced merely of profit. The following practices are listed as any self-advertisement, except such as is authorised the national code of medical ethics; taking part in plan of medical care in which the doctor does not professional independence; and receiving any other than a proper professional fee, or paying money in the same circumstances without the of the patient. Under no circumstances is a permitted to do anything that would weaken the or mental resistance of a human being, except for therapeutic or prophylactic indications, imposed in interest of the patient. A doctor is advised to use caution in publishing discoveries, and when called to give evidence or a certificate he should state that which he can certify.

A doctor must always bear in mind the importance preserving human life from conception until death. owes to his patient complete loyalty and all the resou of his science, and where necessary should summ another doctor. He owes his patient absolute secr on all which has been confided to him or which he kn because of the confidence entrusted to him. A doc must give the necessary treatment in emergency, un he is assured that it can and will be given by oth The code concludes by setting out the following du of doctors to one another: A doctor "ought to beh to his colleagues as he would have them behave to him he must not entice patients; and he must observe principles of the Declaration of Geneva.

It was agreed to leave it to national medical asso tions to modify the wording of the international code medical ethics for use within their countries, provi that it conformed to the principles of the code.

GENERAL PRACTITIONER AND SPECIALIST

On the second day Dr. R. L. SENSENICH (U.S. reported that the committee on standards of medi care and allied subjects, of which he is chairman, considering the best method of obtaining informati on undergraduate medical education. The idea was be objective, not critical. The report was adopted.

The committee on postgraduate medical educati and specialist training presented a bulky docume containing data on postgraduate facilities from answ to questionaries returned by 32 national medical associ tions. The report noted how Great Britain and t U.S.A. are the countries to which doctors of oth nations mainly turn for postgraduate studies, and th doctors in these countries do not often go abroad postgraduate work. In Cuba and Eire the length training required for specialisation is less than a yea some other countries insist on five or six years. In t Dominican Republic and in Italy postgraduate educati for general practitioners is compulsory. The committ defined "consultant," "specialist," and "general prac tioner" as follows:

> A *consultant* is a medical practitioner whom his colleagu recognise as one worthy to be called in for advice and opin by virtue of his special knowledge and experience.
>
> A *specialist* practises in one or more particular fields medicine and is often a master of some special techniq
>
> A *general practitioner* is a family doctor.

Dr. PRIDHAM, chairman of the committee, declared "The matter of postgraduate work is one which, than goodness, the profession still holds in its power and not subject to government interference." It was specially appropriate subject for the World Medic Association.

e investigation, he said, had shown that the level of raduate education and the facilities for it differed y throughout the world. The committee felt that country should arrange facilities for the inter- ge of students, to raise standards throughout the world. Secondly, the report drew attention to ecessity for continuing the education of the general itioner and emphasised his importance in any ne of medical care. In some countries there was y a fear that the general practitioner might be zed out or his importance lost sight of, and that rge a proportion of young men on qualifying might to become specialists. "In my own country." Dr. Pridham, "the emoluments and remunerations d to the specialist, and possibly the easier life which possible for them, are bound to attract younger to attempt to enter the ranks of the specialists. hall have to guard against this tendency."

of. A. P. **CAWADIAS** (Greece) felt that in the future pecialist would be the consultant; with the advance nowledge the general consultant was disappearing. ssor Cawadias also spoke of the importance of a r having a good level of general culture, which was ed upon in the entrance examinations to Greek ersities. General culture was even more important the specialist than for the general practitioner; something should be done, as in Greece, for the alist to show that he had that culture.

. **CIBRIE** (France) disagreed with Professor Cawadias his last point. The general practitioner should not egarded as at the bottom of the ladder and the ialist at the top. Dr. **SONDERVORST** thought that the for physicians attending postgraduate courses should be paid by the State but by the doctor himself or ugh grants or fellowships.

r. **SEN** deplored the tendency for the specialist to k of himself as on a higher plane; the general titioner was equal, if not superior, to the specialist. many countries the period of training for specialists being extended further and further; in Austria as now six years. Medical education was already ciently extensive; and time and expense should borne in mind. In establishing schools for general titioners or specialists, emphasis should be laid on imum and not on maximum standards. "We did have all that long and expensive education which are insisting on for others." The difficulty about ure, Dr. Sen continued, was in defining what was nt by it. It seemed that to have culture one needed h leisure and money. In India the highest definition ulture was "tolerance." Culture could be obtained n study, not only of Greek and Latin, but also of the ient languages of the East.

r. **MORRIS FISHBEIN** (U.S.A.) suggested that it would an error to establish general-practitioner hospitals distinct from hospitals in which the general practi- ler and specialist both worked. Where a State medical rice was in operation there was a tendency to relegate general practitioner to second place—he became a on who merely referred cases to a specialist. In the A. the trend was towards giving the general practi- ler greater opportunities for the care of cases which merly went to the specialist. This was the effect of ances in medicine; in otolaryngology there was le left for the specialist except fenestration. Dr. hbein called for complete integration of the general ctitioner into the hospital service, with adequate resentation on the hospital staff and executive mittee.

Professor **FELLINGER** declared that medicine was ending and it was very important that the doctor's cation should also be extended. In Austria not only l the length of the specialist's training been extended six years, but three years' hospital experience was now necessary before a general practitioner could practise. Dr. **DAG KNUTSON** (Sweden) believed that it was perhaps more important for the general practitioner to be cultured than it was for the specialist. It was a great danger that not only were general practitioners looked down on, but they tended to look down on themselves. The problem was related to the economic factor; if conditions for the general practitioner were not good, and were far less good than for the specialist, he would be looked down on. In Sweden, the general practitioner was referred to as a specialist. This raised him in his own eyes, as well as in the eyes of the world.

Dr. **W. CLINE** (U.S.A.) moved an amendment to the report, to read:

> "Individual hospitals should welcome visits from general practitioners. Posts should be made available to them. Such posts are of benefit both to the specialist and the general practitioner. There should be general practitioner beds in ordinary hospitals and the general practitioner should be integrated into the hospitals. In this manner the general practitioner will become a better doctor and have more interest in his work."

Professor **FELLINGER** and others said that in European continental hospitals there was a different system of allocating beds, and here the proposal would not be practicable. It was agreed, therefore, to add the words "where possible," and the amendment was carried. Dr. **PRIDHAM** pointed out that doctors from all over the world, most of whom were themselves specialists, had emphasised that the division between specialist and general practitioner was too wide.

The assembly approved recommendations that after the medical-school course there should be an additional period of training "in an approved post," before engaging in independent practice; and that a specialist should be required to obtain adequate theoretical and practical postgraduate training. It also called on national medical associations to develop arrangements whereby postgraduate studies and practical experience would become available to members of the profession in other countries. Dr. H. **GUY DAIN** mentioned that in Great Britain the new Medical Bill would allow foreign graduates coming to this country for further studies to have their names placed temporarily on the Medical Register so that they could take charge of patients and thus gain experience.

PUBLICITY

Dr. **FISHBEIN**, presenting the report of the committee on ways and means of securing publicity, observed that medicine no longer functioned in a vacuum; and it was important that doctors and the general public should be aware of the assembly's activities.

The **PRESIDENT** reported that the council had appointed a committee on standard nomenclature.

The assembly considered in a somewhat critical mood the activities of other international organisations and the association's relation to these organisations.

ELECTION OF OFFICERS

The last day was devoted to a discussion on social-security schemes as they affect medicine; but first the assembly unanimously elected Dr. E. L. Henderson (U.S.A.) as president-elect for next year; Dr. Henderson is president-elect of the American Medical Association. The following retiring members of council were re-elected: Dr. Cibrie, Dr. Knutson, and Dr. Pridham.

SOCIAL-SECURITY SCHEMES

Dr. **ROUTLEY** (Canada) took the chair for the discussion on social security, which was opened by Dr. **HILL**, who presided over the committee which had drawn up a report for the assembly. This report, which comprised a factual survey of the social-security schemes in different countries and their effect on the medical profession, stated:

> "In many countries at present medicine is faced with two sources of danger to its freedom—by non-medical insurance bodies and by governments. The danger from the first lies in the attempt to subordinate medical service to the conservation of financial resources by subjecting the doctor and his services to non-medical control. The danger from the second lies in the possible transformation of the doctor into a civil servant."

Dr. Hill declared that this problem confronted member associations of the W.M.A. all over the world. "Wherever schemes of social security embodying schemes of medical service are being evolved," he said, "the medical profession is being presented with the problem of preserving, not only in the interests of the profession but also in the interests of the public, the essential freedoms of the medical profession in the conduct of its work." It was essential that the medical profession should exchange facts about what was happening in the different countries; for governments were closely associated among themselves in this matter, and "information passes from government to government as swiftly as rumour passes around a mothers' meeting." The association had good relations with the W.H.O., but there was equal need for vigilance and scrutiny of what governments were doing in the international field.

In the debate, delegates described experiences in their States. The first speaker was Dr. **Dain**, who criticised the sudden introduction of a complete medical service in Great Britain. "The Minister believes in the method of learning to swim by throwing you in and seeing what happens," commented Dr. Dain. In this case the inevitable had happened. Doctors were overworked; there were insufficient hospital beds and nurses; and the demand for free material had greatly exceeded the estimated demand. All that could have been foreseen. The position of the medical profession was very difficult. The remuneration of the general practitioner was even yet not settled, fifteen months after the scheme began, and it was only within the past few weeks that specialists and consultants had known what remuneration they would receive. Freedom for the patient to choose his doctor, and for the doctor to choose where he should practise (provided it was not an over-doctored area) and to practise the system of medicine which he preferred, had been secured. But Dr. Dain criticised the refusal of the Government to allow the private patient to obtain drugs under the scheme, and the establishment of a virtual State monopoly of hospitals; and he suggested that the few hospitals which were exempted could form the beginning of a second hospital service outside the State. The system of payment of general practitioners by capitation fee prevented doctors from becoming civil servants and gave them freedom to criticise the service. The rush of work had made many doctors complain that they were not able to give the attention to each patient which they would have liked, but he hoped this was merely a temporary phase. In hospitals the effect of the change-over from honorary to paid service had not yet been good; because they were paid by sessions, surgeons and physicians tended to work in sessions, but Dr. Dain thought that they would recover from this. He believed that the heartburning over status could have been avoided if posts and not persons had been graded. "These," concluded Dr. Dain, "are the sort of teething troubles that we have suffered from in the first year. I may say for the B.M.A. that we are the fathers and the grandfathers of the idea of a State service. We are determined to do our best to see that the State service in this country is ultimately the best possible. We have some journey to go before we succeed in attaining our ambition, but it is our ambition to make it work."

Dr. **Cibrie** declared: "If we get everything for nothing all the time, we will not be free any more." The provision of the best medical care for all was the aim of the W.M.A.; for this it was necessary to raise standards and to fight for the liberties of the profession. " afraid that through payment by the capitation physician was placed at the mercy of the patient. France and Belgium payment was made acc the actual visit or treatment. But each medical pr should decide this point for itself. Under no c stances, however, should the doctor be made a servant of the State.

Dr. P. **Glorieux** (Belgium) described how a medi service scheme had been imposed in his country wit any consultation, their minister of health, like others, taking the attitude: "I act first; thin comes afterwards." The doctors had had to obstruct administrative machine to get representation. The committee recommended a scheme acceptable to all, no changes were made. Now the government found cost so heavy that the nation could not bear it, an had set up a new commission to reconsider the w matter. But even on this commission there was representation of the doctors.

Dr. W. **Magner** described the steps being taken wit view to establishing a full measure of health insur in Canada. The Canadian Medical Association, he would oppose any Act, on the British model, ve professional control of doctors in the hands of one —the minister of health. It recognised that advance medicine had greatly increased the complexity and c of medical services, and so led to inequalities. It thou that this could best be overcome by extension of vol tary insurance schemes, with government subsidies those in the lower-income groups.

Dr. **Knutson** said that everyone in Sweden always been able to obtain the very best medical c regardless of their means. Yet there had now been forward proposals for comprehensive compulsory in ance to cover every form of medical care, preventive well as therapeutic; to make all doctors full-time c servants; to regulate the doctors to work 7 hours a d the general office-hours in Sweden; and to create hea centres. As a first step, it was proposed to set doct fees at 5s. for the first visit and 3s. for the second subsequent visits, regardless of whether the doctor a general practitioner or a specialist, or of the nat of the treatment given. Those who put forward the proposals did not mention the cost. It had been diffic for the Swedish Medical Association to estimate expense, because the wording was hazy, but it calculat that the initial cost would be more than £70 million, wi an annual cost of £50–55 million, as opposed to £30- million being spent at present. Taxes in Sweden we already at a forbidding height. The Swedish Medic Association held that the freedom of doctor and patie was seriously threatened by these proposals. Instea the position should be dealt with by helping with tra port arrangements (an important factor in Sweden by encouraging and extending voluntary schemes; augmenting the technical facilities at the disposal the general practitioner; and by arranging for postgraduate education.

Dr. **Llewellin Davey** reported that the aim of Australian government was to socialise and regim doctors, and it hoped to bring about a cessation private practice. A start had been made with Pharmaceutical Services Act, which was regarded doctors as the "thin end of the wedge" of control. T Act had now been largely dropped. Three princip that the federal council of the B.M.A. in Austral thought essential were: payment by the refund syst exclusively (the patient paying the doctor and collecti the money back); a scale of benefits and not of fe and no experimental health centres.

Dr. J. H. **Harvey Pirie** instanced the suspension the free hospitalisation and medical-services scheme the Transvaal as an example of what the me profession could do if it organised itself and fo

SEN said that a committee had recommended that 0 years India should have complete social security, e prime minister had lately declared that India be a welfare State. But at the moment funds isufficient.

G. MOUTHON emphasised the need for a constructive e. In France the medical profession was trying perate with the government to evolve a scheme would be satisfactory to those who wanted a service , infringe upon the rights of the medical profession.

CLINE explained that in the U.S.A., with its vast nd diverse population, any national comprehensive would be beset with difficulties. The American d Association desired the best medical care for all, lieved that this could best be achieved by ensuring te freedom for doctors. It was therefore pressing largement of the voluntary insurance schemes. als were before Congress which would confer powers to those vested in the British Minister of Health ; any of these proposals were indeed lifted straight he British scheme. This was regarded as a purely atching move by people who were not primarily sted in health. The A.M.A. felt that compulsory insurance was the thin end of the wedge. "We are sed and we are determined to fight," said Dr. Cline.

HARVEIAN FESTIVAL

St. Luke's Day, Oct. 18, Dr. GEOFFREY MARSHALL red the Harveian oration to the Royal College of cians of London. His subject was Individuality dicine, to which Harvey's own independence of offered an appropriate opening. Like us, Harvey in disturbed times, and then as now, Dr. Marshall rapid changes in the relationship of the individual the State were not accomplished without some ice and resentment. When Harvey practised, and Thomas's were the only hospitals open in on, for many old foundations had been closed g Henry VIII's persecution of the religious foundawith which they were associated, "so that they t be brought into decent and convenient order, h the King would not suffer poor and miserable e to go unrelieved." Did we even now today times catch an echo of this Tudor propaganda ? in the 18th century came the renaissance of the itary hospitals. In form and purpose they were se, but they had common traditions of service their freedom from central authority gave them iduality.

en in due course the Dawson report of 1920 was figured into the Bevan plan, some of us (Dr. hall continued) suggested that insufficient attention being given to individualism. The reply was always Government money would be used and that he paid the piper called the tune. But we were all ng the piper and we often called different tunes: there was only one piper: he had not the music ome of the tunes; and so he tended to play the tune h came most easily and which suited his pipe. the whole, Dr. Marshall thought, the traditions of eaching hospitals had been respected, but some other itals had fared less well. We heard of hospitals g closed, the character of others was changed, 50,000 were out of service, there were rumours of standardon of design of instruments and of preparations. were here, the orator ended, to help and not to ler, but it was right that we should call attention he inadvisability of destroying the will of the individual erve the community, and we must foster freedom diversity rather than standardisation and conformity. he service was to succeed, Government departments t absorb something of the sense of urgency and of onal responsibility of the old voluntary hospitals. y must not enmesh people in a web of restrictions. l they should remember that a multiplicity of mittees could be a hindrance to those who healed sick.

t the close of the oration Lord Moran, the president nted the Moxon medal to Dr. N. Hamilton Fairley for his work on blood pigments and on malaria.

In England Now

A Running Commentary by Peripatetic Correspondents

SECRETARIES came into their own at the meetings of the World Medical Association. The chairman of council is, in his other sphere, general secretary of the Canadian Medical Association, while the president has previously lived a quiet Jekyll and Hyde existence as the Radio Doctor and secretary of the B.M.A. It was sad that the fortunes of war prevented the general secretary of the Chinese Medical Association from attending to see in action the gavel which his association presented to the W.M.A. Unlike the intimidating "*Bang !*" of the ordinary Western gavel, this made a more subtle "*Plop !*" each time the president wielded it. The letter from Dr. John Yui which accompanied the gift explained that the gavel was made in the shape of a fish because it was believed that the fish always keeps vigil, "and thus it is carved in wood as a beating instrument to arouse people from idleness and slumber."

Looking round the assembly of delegates from nearly every part of the globe, I was struck by how alike doctors look. True, the Australian delegate was sunburnt, the Spanish-speaking ones had well-oiled black hair (though one of them, from South America, was a Dr. O'Leary), and only the Belgian delegate wore a black coat and striped trousers: and while many favoured pipes, the Danes came from a country where cigars are the normal smoke: but you would have picked out each as a doctor anywhere. The only startling splash of glamour came from the young Spanish interpreter, who not only wore a different dress every day but had sometimes changed her morning one by the afternoon.

Apart from the president, the only speakers who relieved the sometimes rather heavy debates with a sparkle of humour were Dr. R. C. Sen, of India, and Dr. Morris Fishbein, editor of the *J. Amer. med. Ass.*, and also of the trilingual *Bulletin* of the W.M.A. Illustrating his difficulties with the latter, Dr. Fishbein said that the Spanish text seemed always 15% longer than the French and English, and a French translator produced one version on manuscript, then altered it all on galley, and wanted to repeat the process when the page-proofs arrived. As a general example of how one may translate the same thing in various ways, he told of the obstetrician who wanted a motto to put (for some unknown reason) over the door of his new delivery-room. He finally thought *Primum non nocere* would suit. But he wanted to make sure, so he took it to the professor of classics at Harvard, who said it did mean "Do no harm," but it also meant: "Don't be naughty in the first place." This rather worried the obstetrician, so he went to the professor of classics at North-Western University, who confirmed both translations but gave as an additional meaning: "There is no harm in doing it once."

One used to think that if all spoke English it would be much simpler; now, of course, we know it only makes matters worse. Dr. Fishbein said that when he went over an English hospital—the delegates visited Barts on the Monday—he found that what he called a "food cart" was a "trolley," which in American meant a street-car. He bemoaned that we call a thing a "lift" when he calls it an "elevator" and the only kind of elevator we know is the instrument for raising the periosteum. For my part, I rushed out to get the pen of my aunt to write this.

* * *

We sat down to luncheon in the mental hospital with our Scandinavian hosts. The first course was "smorrebrod," just as my globe-trotting friend at home had assured me it would be. The charming lady doctor next to me repeatedly and persuasively offered me more. But I politely and firmly refused, though I had only touched a morsel: for had not my friend warned me that this was only hors d'œuvre, soon to be followed by more solid fare ? But for his advice I might easily have been deceived, for smorrebrod is a veritable *olla podrida*: pickled herring, smoked salmon, egg, cucumber, ham, tomato, sardines in tomato sauce, radishes, boar's head (I think), beef (I hope), horse (I fear), &c., &c., &c. Suddenly we all rose from the table, and I found to my consternation that the meal was over, and I had to urge my collapsing frame on an end[illegible] through the long passages, wards, and [illegible] stitution until the next feed six weary hours later. *Experientia docet.* So next day, having fortified myself with an enormous late breakfast, I knew just what to do at this hospital lunch. Boy, did I make that smorrebrod look silly—all 57 varieties of it! But was I dreaming? I was at once brought a plate of thick vegetable soup containing a poached egg. Before I could protest, which *took time* as I had to look up each word in my pocket dictionary, the waiter had brought me another plate of the same. This was followed by half a spring chicken with vegetables to match, then the other half, then a sweet, then an ice, and then a pause to smoke a cigarette and toast each other in schnapps. And then we began the whole business over again. How did I feel this time, and how did I stagger over the equally long passages, wards, and grounds? The gastronomic exertions expected of us in foreign parts are indeed formidable to the visitor from austere England.

* * *

My Irish colleagues and I spent the afternoon being conducted round Linnæus's house and garden. We followed this by suitable celebration. Proceedings livened up in the train back with "Give us a song Michael, before the dhrink dies in yez." So we all sang, except the dour Scot in the corner who tried to look as if he did not belong to our party. But the journey was long, the dhrink died in us, and as sleep overtook us I heard two voices: "Why, before this afternoon, Pat, Oi'd never even heard of Linnæus." "Shure, Molly, and had ye not? And wasn't it himself that invented the stethoscope?"

* * *

Like many of your seriously minded readers, on Saturday mornings I always turn first to "In England Now." Today I opened my *Lancet* at page 712, and being at breakfast folded the copy back to keep it out of the margarine, so I did not and could not see page 713. As I enjoyed the first two items, I had a counter-current of thought. "No-one ever seems to write about dreams in I.E.N." I said to myself. "There is a fine scope for speculative wit and humorous incident in that direction. Must scribble out something about these funny compression dreams of mine." Then I turned the page to find that another Peripatetic had done just that. Now this seems more than a simple coincidence; indeed, it looks to be a pretty fair example of the precognition phenomena described by Dunne in his *Experiment with Time.* I have had several experiences of the kind before, but this is one of the best because of the agreement on several points. But when these incidents do occur why are they almost always so trivial?

* * *

Who, I wonder, was the disingenuous fellow who first persuaded us that tobacco would not grow in this country? Some crafty chap, I suspect, with a packet invested in the American Colonies. In point of fact, of course, the stuff grows here like the weed it is. There are two beds of it in my garden, the result of sowing a thimbleful of dust-like seed, and I am hard put to it to find time to cut and string the leaves ready for drying; but the prospect of smoking 25 lb. of the stuff at fourpence an ounce keeps me wonderfully cheerful.

* * *

We're a little bit late
With the news in Kuwait,
But it seems strange to me
That sugar in tea
Thrown into a pot,
As likely as not
Kept under the bed,
Can turn Fehling's solution from blue into red.

*** Our peripatetic correspondent of Sept. 10 (p. 487) replies: "Blast! I should have asked Mrs. Brown whether her lodger took dextrose, lævulose, mannitose, lactose, galactose, aribinose, pyrocatechin, hydroquinone, or salicylates in his tea."

Letters to the Editor

SEEING THE PATIENT THROUGH

SIR,—Will you allow me to thank your correspond for their letters on this theme? They have done valuable underlining and suggested new aspects unlimited topic.

Professor Witts (Sept. 24) hunted in vain for almoners. He will find them taking part in a conference half-way down column 4; but I grant the brevity of the reference may have hidden my viction of their immense importance in any hospital coördination. We can be grateful for description of their highly developed function in his unit. Mr. Roy Goulding has sought to define a p for the student in the dealings between patient hospital; I am certain that the systematic weekly w round he suggests is the right way to keep him with his patients' progress—in order that he may ans their questions sensibly—and of emphasising the patie identity as something more than a teaching case.

Two main issues have crystallised out of this cor spondence; first, the internal hospital organis for seeing the patient through, with which I conce myself particularly in my paper; secondly, what may call the hospital-doctor relationship.

I believe that the machinery for seeing the pati through hospital is usually in existence, although it often faltering for lack of drive or creaking for lack lubrication. Miss G. L. John, medical records offi to the Bermondsey and Southwark Hospital Man ment Committee, a "specialist in coördination," (Sept. gives an alarmingly comprehensive account of her fu tions; she slides her tentacles around hospital dep ments like a well-meaning octopus and I feel that w her work is finished not only the "absent-mind leave-taking houseman" (who will take this descrip to heart, no doubt!) but the rest of the medical st also will be able to go on indefinite furlough. No; t agencies are already there, under the control of hous governor or medical superintendent, and I fear that the long run the coördinator will sap *rather* th stimulate their initiative; voluntary and sustain concentration on the welfare of the patient by each agen is a much better recipe.

Lastly, the hospital-doctor relationship. To my mi the most valuable letters in the correspondence have com from general practitioners; I am particularly indebte to Dr. Lindsey W. Batten (Oct. 1) and agree with ever word he writes. This is really the crux, that *it is th patient's doctor and not the hospital who must see hi through.* With the present hierarchical system medicine in which the technical rules supreme, the is a tendency for the hospital to skim the cream off gene practice and monopolise all that is important interesting. This process *must* be reversed if gene practice is not to be impoverished; *the hospital m* emulate the best standards of consultant practice taking infinite pains over the patient and feeding hi back to his doctor with a garnish of helpful informati and advice.

Taking infinite pains is the only possible formul In the midst of many medical frustrations it is a guid to the lasting satisfaction of seeing the patient through

J. M. LIPSCOMB.

St. George's Hospital, London, W.1.

PENTAMETHONIUM BROMIDE

SIR,—Pentamethonium bromide is at present under a shadow in the anæsthetic world because of *side-effects* which the physician may be able to use.

A substantially fit woman of 47 had a cholecystectomy under anæsthesia with thiopentone, nitrous oxide and oxygen 40%, and decamethonium iodide. During $1^3/_4$ hours she had doses of decamethonium iodide 5, 4, and 3 mg., each cing at least momentary respiratory arrest which was ed by normal recovery. At the end of the operation was slight respiratory depression from the last dose and resolved to test the effect of pentamethonium bromide uch 20 mg. was given and then after two minutes a r 20 mg. The pulse-volume decreased slightly, but ation was abolished after a further three minutes he total volume after one hour was still only 100 ml.

vas then suggested that she might be a submyasthenic hat pentamethonium bromide might have its small sing effect in the same way as *d*-tubocurarine. Accord- 1 mg. of neostigmine was given with surprising and diate recovery of respiration.

patient showed no overt signs of myasthenia and d a curare-sensitivity test.

seems that before pentamethonium bromide is at all extensively—especially in "medical" peutics—the possibility of its risk in myasthenics d be further investigated.

don, E.11. J. BARNARD.

VACCINATION UNDER THE N.H.S. ACT

R,—In his report[1] on infant vaccination in England Wales during the six months, July–December, 1948, E. T. Conybeare, of the Ministry of Health, shows in this period, the first half-year under the new Act, proportion of infants vaccinated fell to about half t it was before the Act came into force. He concludes rticle by saying :

> "If the figures for 1949, when they become available, ow that the decline of infant vaccination under the ational Health Service is not temporary, measures, such an increase in the number of vaccination clinics . . . and e working out of some plan to facilitate domiciliary infant ccination in areas not served by such clinics, may be gently required. Such measures, pursued with the energy t into the campaign for immunisation against diphtheria, ight well produce similar results and make the child pulation of this country as well vaccinated as that of the nited States or other countries, where protection against mallpox is regarded as the important matter that it doubtedly is."

s not Dr. Conybeare rather begging a highly debatable stion when he makes that final assertion ? Is a well-cinated child population really so very important in tecting a community against smallpox ? Surely there great deal of valid evidence pointing to the opposite clusion. Decline in infant vaccination is not a new nomenon—it has been going on continuously for r half a century—but, so far from its having been owed by an increase in smallpox mortality, the mor- ty has fallen steadily until now it is practically ligible.

Moreover, in those parts of the country where the line in infant vaccination has been greatest the same rease in smallpox mortality has been witnessed. us, in the city of Leicester the average proportion of ants vaccinated has for very many years been under (Dr. Conybeare tells us that it has now fallen to %), yet during the past 40 years there have been ly two deaths from smallpox, and other places have d a similar experience. After all, it is adults who are st exposed to the danger of smallpox, and the effect infant vaccination in protecting this section of the mmunity is very doubtful. It may reasonably be argued at infant vaccination, by masking the disease in adults, hen the protection conferred on the individual is earing off, neutralises—or more than neutralises—any lue to the community derived from the partial munity conferred on the individual adult.

Incidentally, in the 14 years, 1932–46, there were in ngland and Wales only 28 smallpox deaths (an average 2 per annum in a population of 40,000,000), and not one of those deaths was in an infant under one year of age. Yet in the same period there were 51 deaths from vaccination in infants under one year of age.

Dr. Conybeare mentions admiringly the United States "and other countries." What other countries, including the U.S.A., can show better results in dealing with smallpox than Great Britain ?

So I venture to suggest, with all respect to Dr. Conybeare, that perhaps infant vaccination is not so very important a matter in protecting a community such as ours as he seems to think.

Leicester. C. KILLICK MILLARD.

CONTROL OF TUBERCULOSIS

SIR,—I have read with great interest Dr. Hoffstaedt's letter of Oct. 8. Like him, I admire the efforts of frustrated chest physicians in anticipating the sanatorium-applicants' treatment during their waiting period, but I feel that a word of warning would not be out of place.

We are, many of us, becoming accustomed to admitting patients in whom some form of collapse therapy has been undertaken in the home. The results of such treatment have not, however, been uniformly successful ; often the requisite period of bed rest before the induction of collapse therapy has not been observed, and in many cases we should have preferred to receive the patient with an untouched pleural space.

I cannot subscribe to Dr. Hoffstaedt's statement that some scheme of early ambulatory collapse treatment should be adopted. It is our experience that collapse therapy should not be undertaken lightly—certainly not until after some months of bed rest. After induction, the patient requires careful and prolonged observation and grading if the onset of effusion and other complications is to be avoided. By getting patients into hospital, inducing collapse, and quickly returning them to their home environment, thereby short-circuiting sanatorium treatment, we shall, in my opinion, be courting disaster.

Furthermore, with streptomycin and *p*-aminosalicylic acid now available "over the counter," another possible danger arises in that chest physicians will be greatly tempted to prescribe these drugs during the waiting period, with the result that the sanatorium physician may be further misled as to the patient's natural powers of resistance. In short, I feel that many sanatorium physicians would agree with me that, whenever possible, they would prefer to receive their patients "preconditioned" by bed rest only.

Preston Hall Hospital,
Maidstone, Kent.

F. TEMPLE CLIVE
Physician-Superintendent.

INTERPERSONAL FACTORS IN ILLNESS

SIR,—In his article last week, Dr. Casson referred to the possible benefit of bringing together patients with similar ailments.

Dr. Böhler, in Vienna, made excellent use of this factor. Before the days of plaster-jackets spinal fractures meant long invalidism, and in order to convince patients of the freedom of movement the jacket provided, there were separate wards for spinal cases. New arrivals saw exercises performed and weights lifted a few days after application of the jacket. One man, a taxi-driver, continued his duties while wearing it. The emotional uplift thus provided encouraged even the most fearful to respond. Similar arrangements for other fracture cases worked equally well.

Romford, Essex. H. SYMONDS.

SIR,—The following passage in Dr. Casson's article supports the almost universal fallacy that addiction to tobacco and alcohol are vices :

> "The average doctor . . . may also condemn in his patients what his conscience does not allow in himself, and this moral severity may cloak itself as professional solicitude. For instance, the doctor may forbid alcohol or tobacco . . .

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[1] *Mon. Bull. Min. Hlth, P.H.L.S.* October, 1949, p. 204.

consternation that the meal was over, and I had to urge my collapsing frame on an endless peregrination through the long passages, wards, and grounds of the institution until the next feed six weary hours later. *Experientia docet.* So next day, having fortified myself with an enormous late breakfast, I knew just what to do at this hospital lunch. Boy, did I make that smorrebrod look silly—all 57 varieties of it! But was I dreaming? I was at once brought a plate of thick vegetable soup containing a poached egg. Before I could protest, which took time as I had to look up each word in my pocket dictionary, the waiter had brought me another plate of the same. This was followed by half a spring chicken with vegetables to match, then the other half, then a sweet, then an ice, and then a pause to smoke a cigarette and toast each other in schnapps. And then we began the whole business over again. How did I feel this time, and how did I stagger over the equally long passages, wards, and grounds? The gastronomic exertions expected of us in foreign parts are indeed formidable to the visitor from austere England.

* * *

My Irish colleagues and I spent the afternoon being conducted round Linnæus's house and garden. We followed this by suitable celebration. Proceedings livened up in the train back with "Give us a song Michael, before the dhrink dies in yez." So we all sang, except the dour Scot in the corner who tried to look as if he did not belong to our party. But the journey was long, the dhrink died in us, and as sleep overtook us I heard two voices: "Why, before this afternoon, Pat, Oi'd never even heard of Linnæus." "Shure, Molly, and had ye not? And wasn't it himself that invented the stethoscope?"

* * *

Like many of your seriously minded readers, on Saturday mornings I always turn first to "In England Now." Today I opened my *Lancet* at page 712, and being at breakfast folded the copy back to keep it out of the margarine, so I did not and could not see page 713. As I enjoyed the first two items, I had a counter-current of thought. "No-one ever seems to write about dreams in I.E.N." I said to myself. "There is a fine scope for speculative wit and humorous incident in that direction. Must scribble out something about these funny compression dreams of mine." Then I turned the page to find that another Peripatetic had done just that. Now this seems more than a simple coincidence; indeed, it looks to be a pretty fair example of the precognition phenomena described by Dunne in his *Experiment with Time*. I have had several experiences of the kind before, but this is one of the best because of the agreement on several points. But when these incidents do occur why are they almost always so trivial?

* * *

Who, I wonder, was the disingenuous fellow who first persuaded us that tobacco would not grow in this country? Some crafty chap, I suspect, with a packet invested in the American Colonies. In point of fact, of course, the stuff grows here like the weed it is. There are two beds of it in my garden, the result of sowing a thimbleful of dust-like seed, and I am hard put to it to find time to cut and string the leaves ready for drying; but the prospect of smoking 25 lb. of the stuff at fourpence an ounce keeps me wonderfully cheerful.

* * *

We're a little bit late
With the news in Kuwait,
But it seems strange to me
That sugar in tea
Thrown into a pot,
As likely as not
Kept under the bed,
Can turn Fehling's solution from blue into red.

*** Our peripatetic correspondent of Sept. 10 (p. 487) replies: "Blast! I should have asked Mrs. Brown whether her lodger took dextrose, lævulose, mannitose, lactose, galactose, aribinose, pyrocatechin, hydroquinone, or salicylates in his tea."

Letters to the Editor

SEEING THE PATIENT THROUGH

Sir,—Will you allow me to thank your corres
for their letters on this theme? They have done
valuable underlining and suggested new aspects
unlimited topic.

Professor Witts (Sept. 24) hunted in vain for
almoners. He will find them taking part in a
conference half-way down column 4; but I grant
the brevity of the reference may have hidden my
viction of their immense importance in any scheme
hospital coördination. We can be grateful for
description of their highly developed function in his
unit. Mr. Roy Goulding has sought to define a p
for the student in the dealings between patient
hospital; I am certain that the systematic weekly
round he suggests is the right way to keep him
with his patients' progress—in order that he may an
their questions sensibly—and of emphasising the patie
identity as something more than a teaching case.

Two main issues have crystallised out of this co
spondence; first, the internal hospital organis
for seeing the patient through, with which I conce
myself particularly in my paper; secondly, what
may call the hospital-doctor relationship.

I believe that the machinery for seeing the pat
through hospital is usually in existence, although it
often faltering for lack of drive or creaking for lack
lubrication. Miss G. L. John, medical records off
to the Bermondsey and Southwark Hospital Man
ment Committee, a "specialist in coördination," (Sept.
gives an alarmingly comprehensive account of her fu
tions; she slides her tentacles around hospital dep
ments like a well-meaning octopus and I feel that w
her work is finished not only the "absent mind
leave-taking houseman" (who will take this descrip
to heart, no doubt!) but the rest of the medical s
also will be able to go on indefinite furlough. No; t
agencies are already there, under the control of hos
governor or medical superintendent, and I fear that
the long run the coördinator will sap rather th
stimulate their initiative; voluntary and sustai
concentration on the welfare of the patient by each agen
is a much better recipe.

Lastly, the hospital-doctor relationship. To my mi
the most valuable letters in the correspondence have co
from general practitioners; I am particularly indebte
to Dr. Lindsey W. Batten (Oct. 1) and agree with eve
word he writes. This is really the crux, that *it is t*
patient's doctor and not the hospital who must see h
through. With the present hierarchical system
medicine in which the technical rules supreme, the
is a tendency for the hospital to skim the cream off gene
practice and monopolise all that is important
interesting. This process *must* be reversed if gene
practice is not to be impoverished; the hospital m
emulate the best standards of consultant practice
taking infinite pains over the patient and feeding h
back to his doctor with a garnish of helpful informat
and advice.

Taking infinite pains is the only possible form
In the midst of many medical frustrations it is a gui
to the lasting satisfaction of seeing the patient throu

J. M. Lipscomb.

St. George's Hospital, London, W.1.

PENTAMETHONIUM BROMIDE

Sir,—Pentamethonium bromide is at present und
a shadow in the anæsthetic world because of side-effect
which the physician may be able to use.

A substantially fit woman of 47 had a cholecystectom
under anæ [illegible] nitrous oxide and oxy
40%, and [illegible] During $1^3/_4$ hours she h

is motley crowd of registrars has completely upset previous reasonable ratio of those in training to alist and consultant staff. To aggravate the situation is evidence (vide your advertisement columns) that nt policy is still further to increase the establishment gistrars. It is immoral to offer such training to n for whom, at the end of his term, there will not y hope or prospect of advancement. That is what w being done, and the situation is all the more because many of these are men who were registrars e the war and whose careers were interrupted by ce in the Forces. They have been "through the " and have acquired their skills in the school of ical and clinical experience. It was unjust even ntemplate grading such men according to the iples laid down for grading committees when "no nt was to be given to military or previous experi-" and it is unforgiveable to indicate to these men general practice is their future. Are there then y too many specialists? No: any such experienced ar can tell of an increasing volume of specialist fully undertaken by him as the accepted deputy of consultant chief. Why then has establishment of ialists been so niggardly and so dilatory in its rance? Is it economic and financial pressure? direction? Or is it reluctance to spread the privileges pecialist status?

he fact remains that many a *fully trained* man is being sacrificed on the altar of indecision and lost the National Health Service which previously anded specialists. Has the policy changed in "one successful first year"? It has been suggested that would be in the interests of the younger generation training if these *fully trained* men were shelved. ly this must be resisted with all vigour, because it result in a number of disillusioned, embittered, and unded men. Time presses, for many in this dilemma e already been given notice of the termination of r appointment.

or the future, let there be a known establishment registrars, both in the teaching and non-teaching itals, on a regional basis, with senior registrarships rved for those who have the aptitude. Let there be easonable relation between senior registrars and cialist and consultant staff: and let there be frank, sympathetic and considerate, advice to registrars who not up to standard to abandon specialism and to themselves to a career more suited to their ties. Such timely advice will earn the gratitude very reasonable man, no matter how much his pride urt at the time: and ultimately the service will efit, for each man will find his proper place.

SENIOR REGISTRAR.

VASCULAR STASIS

SIR,—Dr. Sevitt tells us in his letter last week that e M.R.C. burns unit has discovered "that the inflam-tory reaction plays an important part in influencing e course of burns." I wonder if they told Metchnikoff? We are also told "that the development of stasis of e local blood-flow in the dermis was preceded by rked œdema, was associated with analgesia, and was lowed by whole-skin loss." This I take to be a scription of blister formation. If so, it does not ite agree with what anyone who has opened a blister ll have noticed—that the pattern of the skin can still e made out at the bottom of the blister and the site of in glands still be seen. Also the blistered area is still inful: only the skin outside the blister is insensitive. f course, "scrubbing" the base of the blister may iterate the skin pattern. The pain diminishes with ister formation but not to the point of analgesia.

In man the preservation of the deeper layers of the kin is part of the rationale for using anti-histamine rugs. If they are exhibited, healing can take place from the base of the blistered area instead of the periphery as would be the case if the whole depth of the skin were lost. (Penicillin must be given as well since most burns are infected early.) A similar phenomenon can be observed in small blisters which are simply protected against bursting and not opened for 7–10 days. At the end of that time their base will be found covered by a fairly thick epithelium. If the whole thickness of skin were separated by blister fluid, healing would take longer and the skin be thinner than it is at the end of 10 days.

I cannot say why Dr. Sevitt has failed to get any effect with anti-histamines in guineapig burns, since he gives no details. But in man they help. Dr. Sevitt's failure to get results is surprising since I can identify at sight a burn that has had 3–4 days' anti-histamine treatment.

Manchester.   S. SHUBSACHS.

ANONYMOUS CRITICISM

SIR,—There has been in the last few days, in the columns of the *Daily Telegraph*, a correspondence devoted to medical matters. Many of your readers will have seen it, so I need only say that someone, signing himself F.R.C.S., has written objecting to the fact that anæsthetists receive the same sessional remuneration as surgeons. This has provoked replies, some signed and some over a nom-de-plume.

I would ask the hospitality of your columns to make a strong plea that if any of us should feel impelled to criticise the relative worth, the activities, or the remuneration of any other branch of the medical profession, then he should do so in a medical journal and not in the lay press. At this time of shifting values, and with the traditional independence of our profession imperilled, it is of supreme importance that we should discuss and settle our domestic differences inside the profession. It is unnecessary to flaunt such matters before the public gaze.

In these columns, Mr. Patey[1] has made a protest against the increasing practice of anonymity. This instance well illustrates the merit of his remarks. Although it may be conceded that anonymity is justifiable if the writer fears reprisals from those he exposes, it certainly does not apply here. Who among us has ever witnessed the economic phenomenon of a surgeon reduced to a state of indigent penury through having incurred the displeasure of his anæsthetist?

Above all, anonymous belittlement of another branch of one's own profession should cause us most concern. Extension of this practice hardly bears contemplation.

London, W.8.   G. C. STEEL, D.A.

LEAD NIPPLE-SHIELDS

SIR,—I should like emphatically to support every word of Mrs. Blacksell's letter last week. In many mothers with cracked nipples attending welfare clinics, we find that it is a choice between weaning the baby and healing the cracks with lead nipple-shields. Only last week I saw a mother who had failed to feed her first 11 babies owing to cracked nipples. Before she was driven to weaning her 12th child for the same reason, the health visitor recommended and loaned lead shields —with, of course, due instructions about washing the breast before letting the baby suck. The cracks were healed in two or three days; the shields were used for about a fortnight: and the baby was breast-fed without further trouble.

We are now to be robbed of this invaluable aid to breast-feeding because harm has resulted from its grossly improper use in one case. It seems scarcely credible. Cannot harm result from the misuse of almost any therapeutic agent?

As Dr. Mackay and Dr. Hunter say in their letter of Oct. 8, lead shields are widely recommended in this to a degree not warranted by the patient's condition, withal in perfect good faith."

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[1] Patey, D. H. *Lancet*, 1948, ii, 572.

Smoking tobacco and drinking alcohol are not primarily questions of conscience—moral issues. They are questions of infection—"psychological infection," it is true—and primarily medical issues. The drug addictions (including addiction to tobacco and alcohol) are specific diseases, like so many other diseases; they are specific intermittent intoxications, whose seriousness depends on the degree of intoxication—the heaviness of the "smoking" or "drinking" in the present case.

Drug addicts are notoriously untruthful, particularly where their drug is concerned; and addicts of tobacco and alcohol have successfully and almost universally propagated the untruths that tobacco and alcohol are luxuries, and smoking and drinking merely bad habits (vices). Vice or moral deterioration (one of whose manifestations is untruthfulness) is, however, merely a symptom. It is secondary to craving. The disease is drug addiction.

The great majority of our profession are addicted to one or other or both of the drugs, tobacco and alcohol. We, the "watch-dogs" of health, are ourselves drugged, *and it is not surprising therefore that we fail on an immense scale to honour our profession—to eliminate disease.*

Wallasey. LENNOX JOHNSTON.

ACUTE MASTITIS

SIR,—Mr. Walsh's article (Oct. 8) shows the close similarity of this complaint in man and in other species.

Some points which may be of practical importance suggest themselves. Thus in the dairy cow, where the question of mastitis is very important, no-one would nowadays dispute the supremacy of penicillin therapy. The mode of application differs, however, from that in *man. The penicillin is injected directly up the teat* canal, either as an aqueous solution or in oily suspension. I believe that the same method is possible in the pig with a fine-bore needle, but I can testify that in the dog and the cat it is virtually impossible.

In the cow routine systemic penicillin therapy is rather expensive, but intramammary inoculation plus sulphonamide by mouth is commonly practised. Whether systemic penicillin can produce a concentration of the drug in the mammary gland approaching that from direct intramammary inoculation has often been debated; clinical experience suggests that in the cow the latter method is infinitely superior, and it also permits the ready introduction of other drugs when penicillin fails.

The question of harm resulting to the child from suckling at an infected breast is one of interest to a veterinarian. An old-fashioned method of treatment employed by farmers is to put a calf to suckle a cow with mastitis which has not responded to other remedies. This method has much to commend it, for I have never seen harm ensue and on occasion the results have been surprisingly good. The calf evidently suffers no harm and the quarter yields to a more persistent method of stripping than anything man can devise. In the bitch, on the contrary, the milk may be a dangerous source of infection for the puppies when the mother contracts metritis, as she not uncommonly does soon after whelping. For the puppies to contract fatal septicæmia the breasts do not even need to be infected, although they commonly are. This condition is generally ascribed to a hæmolytic streptococcus, and prompt penicillin therapy of both mother and pups is necessary if the latter are to be saved. The bitch, however, generally recovers fairly easily unless multiple abscesses form in the breasts. This syndrome in the bitch can be prevented by either administering a sulphonamide or injecting penicillin immediately after whelping. Similarly in the cow a great deal of mastitis is prevented by prompt penicillin therapy either immediately before or after calving wh any of the exciting factors are present—for examp retention of the placenta, general chills, and bloc teat duct. Again, the other period of great dang when the cow is being dried off and milk stagnati occurs, offers scope for preventive therapy.

In conclusion, the wise farmer nowadays has penicillin ointment always handy for immediate appl tion at the merest suspicion of an abrasion, crack, sore in the region of the teat orifice.

Blackburn. A. H. Hogg.

THE REGISTRAR

SIR,—Before the second world war, those who w registrars were considered to have reached the low rung of the specialist ladder, and they had reasonab hope, if not assurance, of promotion. The duration this period of waiting and completion of training vari but was on the average about five years; these speciali in training, however, embarked on this career fu realising the necessity for forbearance in hardship, making sacrifices, and for sustained application to wor and were generally men imbued with enthusiasm a professional ideals in the best tradition. A constant sp *to their efforts, it is important to emphasise,* was t almost certain prospect of promotion. Why was thi It was because there was a reasonable proportion of tho in training to specialist and consultant staff, and y *there was the healthy competitive element* which i always desirable.

Such a system almost assured the production of th registrar best suited and equipped for specialist stat for it was mainly those who had determination, singlene of purpose, and an indomitable spirit who stayed th course. There was thus a process of "natural selection, and these qualities, combined with the trained min made for the sound judgment, discrimination, an *breadth of vision so eminently* desirable in a speciali Admittedly there were in this system those who, bles with private means, did not suffer hardship; but i must be remembered that they too had the resolve *to train and fit themselves for* greater responsibilities. Even under these favourable circumstances such a apprenticeship made an appeal only to those who fel a call that would not be denied.

Today the scene is entirely changed. The registrar i no longer "the man of promise" and his prestige i rapidly waning owing to the enormous increase in hi number. This increase is the outcome of the appea made to the profession to train more and more specialists for the National Health Service. Whence this appeal emanated it is difficult to ascertain; was it from the Royal Colleges, or was it laid down in the policy of those responsible for launching the service? Whatever its source, it has resulted in an enormous band of postgraduates training in the specialties either as established or as supernumerary registrars (both in teaching and non-teaching hospitals), all striving feverishly in the minimal space of time to attain specialist rank. *It is depressing* and is a matter of grave concern that specialism i indulged in and encouraged before the basic principles of medicine and surgery are even partially acquired. Specialism should be built upon the firm foundation of clinical and practical experience, and this cannot be gained in two or three years as some post-war registrars seem to think. The entrance lists for examinations in the postgraduate diplomas have assumed gigantic proportions, and the oft-repeated attempts of many who were never equipped even to be registrars are eloquent testimony of their ineptitude.

Yet many succeed, and it would appear that the next phase in the struggle is to be recognised as a senior registrar. It is erroneously contended that the holding of a postgraduate diploma automatically calls for recognition as a senior registrar.

the use of pethidine by midwives on their own respon- : and the possible employment of the Chassar Moir nent to the gas-and-air machine and of trichlorethylene under review.

FOOD FOR SICK CHILDREN

you like meringues ?" Dr. Wilfred Hadley used to e sick child who wouldn't eat. He seldom got "no" answer; and meringues would appear in his ward ime to time as a preface to solider things. After all, were made—in those days—of sugar and whipped : they meant calories and vitamins, and were easily lated. In a new booklet [1] published by the Hospital k Children, the need to tempt the child is taken into it on the very first page. Those responsible for his e reminded that most children dislike strong flavours, ew kinds of food should be introduced slowly, accom- by something familiar, that contrasting colours in a elp to please the eye, that texture is important, and neals should be served regularly and in small helpings. about various diets follow—diets suitable in febrile , in convalescence, in surgical conditions which deplete ody protein, after tonsillectomy, and in liver disease, itis, cœliac disease, and diabetes. Ketogenic diets, ritant or low-residue diets, and reducing diets are also bed. Amounts are given in grammes, and the total e value of each diet is mentioned. A child taking a odium diet for a kidney condition cannot be given milk, which contains 50 mg. of sodium per 100 ml.; pe for synthetic milk, devised by McCance and Widdow- is therefore included. All those charged with the duty ding sick children will welcome this small but expert

PROSECUTIONS UNDER THE CANCER AND VENEREAL DISEASES ACTS

ST month Middlesex County Council succeeded in two ecutions under the Cancer Act, 1939, and the Venereal ases Act, 1917. Both cases were heard at Hendon Magis- s Court. In the first, Mr. E. F. W. Powell was charged taking part in the publication of an advertisement in a called the *Biochemic Pocket Book* written by him referring n article in terms calculated to lead to the use of that le in the treatment of cancer. In the second case the œopathic Publishing Company, which published the , was charged with recommending to the public the use medicine of a chemical preparation for the relief of ilis.

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versity of London

t a recent examination for the D.P.H. the following were essful:

W. McAllan, J. T. Navaratnam, Geraldine O'Callaghan, matamby Rajaratnam, Bin Mohd Attas Sulaiman.

yal College of Surgeons of England

t a meeting of the council held on Oct. 13, with Sir Cecil keley, the president, in the chair, it was reported that f. R. V. Bradlaw would deliver the first Webb-Johnson ture and that Dr. John Gillies would be the Joseph Clover turer for 1950.

The fellowship of the college was granted to E. J. P. nnehy, and the membership to R. T. Hughes and O. L. omas. The fellowship of the faculty of anæsthetists was nted to Niel McDonald, T. Macdonald, R. A. Hingson altimore), and Harry Daly (Sydney). The following lomas were granted jointly with the Royal College of ysicians:

D.Phys.Med.—A. R. Brown, W. A. Fell, Ronald Harris, Ursula K. Leitner, A. T. Richardson, Barnett Shanson, G. R. M. tcliffe, J. M. Titcombe, N. M. Vallely.

D.I.H.—Lalbihari Banerji, J. J. A. Blakely, Christopher Crowley, J. Das, C. D. Edwards, P. J. Feeny, C. J. Goedvolk, James egory, G. G. Mathew, P. A. B. Raffle, Santosh Kumar Raychaud- ri, J. B. L. Tombleson, R. N. E. Watt.

D.T.M. & H.—Mohammed el Hassan Abu Bakr, Ib Fenger che, Dina Nath Banerjee, Durgadas Banerjee, P. H. Birks, Syed hammad Hasanain Bokhari, Samuel Chen, Gladys Connor M. Daniel, Keshavarao Krishnarao Datey, Madhusudan Mohanlal sai, Jagadish Chandra Dutta, Hassan El Hakim, Syed Fazlullah, C. Franks, F. C. Harris, Jafar Mohamed Karim Rehmany, P. W. nt, Syed Mohammed Ali Khadri, Hoi Kit Kong, W. Z. Kulesza, David Lawrence, Teck Lee, William Soy Ming Ling, I. A. McGregor, D. S. McLaren, H. G. McQuade, Kashi Ram Mahajan, A. H. Marsh, A. N. T. Meneces, Deirdre Moore, J. M. Mungavin, C. K. Newman, G. A. Owen, W. R. Rochester, Anis Mohamed Ali Shamy, Asa Singh, Ratneshwar Prasad Sinha, I. M. S. Stewart, D. E. Thompson, I. G. Thomson, F. G. Williams.

D.O.M.S.—Mohammad Moizuddin Ahmad, Ahmed Attar Al-Hassany, P. E. Anderson, E. L. Arnold, P. W. Arundell, L. G. Bell, Abani Bhattacharya, Laxman Shankar Bhave, B. J. Campbell, F. W. Campbell, Ramchandra Laxmanbhai Dudhia, Geoffrey Forrester, Edward Gartside, Charles Goldin, J. S. Gourlay, H. J. Harcourt, [illegible] Hasan, R. J. A. Heron, R. M. Hewat, [illegible] Jagger, Ruby E. Joseph, W. F. Kinnear, [illegible] Taik Leong, Fung-Ming Li, Ethel M. J. Loudon, J. D. McConn, D. G. S. MacPherson, W. G. Merriman, S. S. F. Munro, A. H. O'Malley, R. E. O'Neal, J. V. O'Sullivan, Vangipuram Raghavachar, S. R. Robson, S. V. Rush, Albert Naoum Sabbagh, O. W. Salkeld, A. C. Sandston, J. W. R. Sarkies, A. G. Shane, B. S. Sher, G. F. G. Siggins, Ponniah Sivasubramaniam, Marjory B. Snodgrass, M. J. Squires, Albert Stafford Steen, A. V. Stevens, Kandiah Vythilingham, Adbul Ghani Zakzala.

D.C.H.—Cecil Abraham, Patience C. Agate, Edith M. M. Alexander, Salah Ud-Din Mohammad Anabtawi, N. P. Bector, N. R. Butler, W. L. Calnan, J. D. Chalmers, B. E. Cohen, V. B. B. Conaglen, E. G. Cook, Rosemary I. Cook, Jessica B. Core, Flora C. Cowan, J. O. Craig, Birenda Nath Das Gupta, Gwendoline A. M. Donald, William Edgar, G. V. Feldman, P. M. S. Fischer, Joan Frankton, Patricia Frodsham, W. M. Fyfe, J. M. Garvie, Dora Green, Leonard Haas, D. C. Henchman, Elisabeth C. W. James, K. E. Jefferson, Barbara Jennings, Andrew Jervis, A. C. Kendall, Sibyl D. Kiani, Gulab Vishnu Kinariwala, Grace Rajamalar Bair [illegible] Robert McDonald, [illegible] R. Menzies, E. H. [illegible] Mitchell, Cecil M. Moore, Janet H. Mountford, Dhirendra Nath Mukherjee, Annie M. Peach, I. C. Peebles, A. F. S. Perera, Maeve Powell, Phyllis Rashbass, Helena M. Reckless, Ravindra Vasant Rele, Stella M. Ring, E. G. G. Roberts, Marion C. Robinson, A. A. W. Roe, Sheila M. Ross, C. M. H. Rotman, R. D. Rowe, R. C [illegible] Russell, T. R. Savage, Isabel B. Schooling, [illegible] Shiner, Joan E. T. Spong, John Steven, [illegible] Symonds, J. J. Tillie, W. M. L. Turner, [illegible] Sulammith Wolff, F. B. M. Woodhouse.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council on Oct. 13, with Sir William Gilliatt, the president, in the chair, the following were admitted to membership:

A. B. Backus, Jessie E. C. Baird, T. E. C. Barns, Anusya Bhagat, D. H. Blakey, V. Y. Bockner, Sudhir Chandra Bose, M. B. Bruce, R. C. Cummin, Mona M. Davin-Power, R. G. Denniss, Henry Doberman, Thomas Dougray, L. W. D. Drabble, C. T. F. Ealand, G. K. Emsley, G. M. Evans, J. J. Foley, P. S. Gardner, G. W. Garland, H.-K. B. Geiser, Elizabeth Gilbertson, Marie P. S. Grant, G. T. Hammond, J. C. Harvey, John Henderson, J. A. Henderson, D. W. Hendry, R. [illegible] E. P. Jones, F. G. E. King, J. M. [illegible] ert, Douglas Latto, J. G. Lawson [illegible] F. Lumsden, J. M. McCracken, [illegible] M. Medine, W. G. Millar, Rustam Moolan-Feroze, L. O. Morgan, M. R. Neely, F. C. R. Picton, J. G. Reynolds, N. A. Richards, Szulin Riterband, T. W. Roddie, Choudhuri Abdus Samad, E. M. Sandler, Olive C. Sandys, J. W. F. Scrimgeour, Sita Sen, J. G. Shelton, Norah P. Sherlock, J. A. M. Smith, Doreen M. J. Stracey, A. B. Swarbreck, J. L. Taylor, Shambhoo Datta Tewary, John Watson, G. F. J. Williams.

ANNUAL DINNER

The annual dinner, on Oct. 12, was attended by Princess Elizabeth and by the Duke of Edinburgh, who spoke appreciatively of the college's contribution to the lessened maternal and infant mortality. This, though the youngest of the Royal Colleges, was the first to become a Commonwealth body. He congratulated Prof. Hilda Lloyd on her appointment as its president. Sir William Gilliatt, the retiring president, said that a fund was being launched for the purchase of larger premises; the building now occupied had been opened nearly twenty years ago by the King and Queen, then Duke and Duchess of York. In this age, he continued, it was especially easy to allow standards to fall; and he hoped that the colleges would help to maintain and enhance standards. He ended by pointing out that Professor Lloyd was the first woman to be elected president of a British medical college. In welcoming among the guests Miss Mabel Liddiard, president of the Royal College of Midwives, Mr. J. A. Stallworthy suggested that her task had been complicated by premature Ministerial deliveries, which, he hoped, presaged the third and last stage of labour. In his reply, Sir Bennett Hance referred to the assistance that could be rendered by the college to the Indian subcontinent, dwelling particularly on the needs of Pakistan, where, he said, the doctor-patient ratio is 1 : 8000. The high maternal mortality indicated that only the fringe of the obstetric problem had been touched. Some, with population pressure in mind, regarded this appalling mortality with greater complacency; but population pressure was the concern of the politician and of Providence. Mr. Geoffrey Keynes, who also spoke for the guests, though himself an ex-officio member of the council, refused to identify

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Diets for Sick Children. Pp. 14. 1*s*. Copies may be had from the dietitian of the hospital, Great Ormond Street, London, W.1.

country. There must thus be a large number of mothers who have used them, including many who were doing so when so much radio and press publicity was recently given to the matter. What sort of confidence can these women have in the doctor or nurse who advised the use of the shields, now that they have been warned against them in this way?

It seems to me a very sorry state of affairs. The article by Dr. Gordon and Mr. Whitehead, describing the case of lead encephalopathy, is of great interest and importance. But I suggest that it would have been far better if the panic action which preceded and followed its publication had been replaced by the following measures:

1. The circulation of a warning to all general practitioners, maternity departments, and health departments as to the need for care in the instruction of mothers in the proper technique of using lead shields.
2. Arrangement with manufacturers and pharmacists that shields should not be distributed without a leaflet giving similar instructions.
3. The initiation of research to test by experiment the belief of those of us who recommend lead shields that they are completely harmless provided that they are used with proper precautions.

In connexion with this last point, it is to be hoped that any evidence of the value of other methods of treating cracked nipples will be published. Dr. Gordon's statement that "shields made of plastic, or other non-poisonous substances, will be safe and equally effective" is at the moment unsupported by any evidence whatsoever.

Health Department, Oxford. MARY FISHER.

SIR,—In their article of Oct. 8, Dr. Gordon and Mr. Whitehead state finally that "shields made of plastic, or other non-poisonous substances, will be safe and equally effective." A letter by Dr. Mackay and Dr. Hunter in the same issue, commenting on the article, recommends that plastic nipple-shields should be given a trial.

A word of warning seems necessary on the use of the word "plastic" in this rather loose fashion, since the composition of plastic materials varies considerably. Most of them are polymerised chemicals which are comparatively inert and therefore harmless, but they may well contain toxic chemicals which have been added as lubricants, stabilisers, and plasticisers. These may in some instances be extremely toxic—e.g., tri-ortho-cresyl phosphate—and to make matters worse they have been known to "bloom" out of the final plastic. Even lead salts are used as stabilisers in certain well-known plastic materials.

Most plastic materials are, of course, quite harmless; and, what is more, harmless plasticisers can be substituted for those which are toxic. Some manufacturers always recommend that their customers should use only certain plastics for purposes that might otherwise produce ill effects. Those used, for example, to manufacture medical instruments or appliances, containers for food or drink, and the like are carefully selected or made with materials which are believed to be harmless.

There exist, however, so many manufacturers of the final product that the use of plastics containing toxic chemicals for unsuitable purposes cannot be entirely excluded. Plastic articles made from such materials as polymethyl methacrylate or 'Polythene' have already been used for medical purposes, and I suggest therefore that they would at first sight seem suitable for the manufacture of nipple-shields. The use of other plastics for this purpose should be considered only after ensuring that they have no toxic properties.

Imperial Chemical Industries Ltd.,
Plastics Division,
Welwyn Garden City, Herts.

D. KENWIN HARRIS
Divisional Medical Officer.

Notes and News

MIDWIVES IN THE NEW SERVICE

IN its latest annual report[1] the Central Midwives Bo surveys with some anxiety the impact of the National He Service Act on the midwife's training and work—a to discussed in these columns a few weeks ago.[2] As early April, 1948, the board informed the Ministry of Health of apprehensions over the probable effect of instituting a l general-practitioner obstetricians and of offering a special to general practitioners attending their own patients. board fears that these measures may have the effect relegating the midwife to the status of maternity nurse, of reducing recruitment of practising midwives, who hit have been attracted by the opportunities for indepen practice. "These opportunities . . . are the only real ad tages which the midwifery profession has to offer to the irregular hours and the arduous nature of their wo compared with health visiting and other callings requ *similar qualifications.*" *Moreover, if pupil-midwives* are be suitably trained for the second examination, they sho have ample opportunity for conducting normal confinements; and any diminution in the number of do ciliary confinements conducted as midwives' cases can result in either a lowered standard of training or a reduc in the number of midwives trained. But even if a reduc in the number of well-trained midwives is contempl they should still be sufficient to cover the whole country to supply the Colonies, which depend on British midw training. The board reiterates the view expressed by Goodenough Committee that

> "In the conduct of labour the pupil-midwife has more techni experience during her training than the medical student, and would be neither wis [illegible] encourage between midwife and [illegible] the care of nor labour. The conduct c [illegible] is the primary essential obligation of [illegible] unity. The med practitioner has many others which may be both urgent exacting."

The board points to the new [illegible] ding in the W of the improved training propc [illegible] arty Midwives.[3] Last December the shortage [illegible] nate led 14 training schools to apply for concessions to enable th pupils to sit the second examination. The number of dist cases available for training has fallen steadily owing not on to (*a*) the incursion of the general practitioner into nor midwifery, but also to (*b*) a decrease in the birth-rate, witho a relative decrease in institutional confinements, (*c*) economic pressure forcing the mother to choose institution confinement, and (*d*) housing shortage, which often mak domiciliary confinement unsuitable. To carry through th Working Party's proposal, the board would have either increase the domiciliary-training facilities or to decrease th number of approved places. *The Working Party* suggeste that the present division of training should cease, but th board rejects this proposal for the time being, particularly since its adoption would jeopardise the staffing of hospi beds. The board is also reluctant to implement the Work Party's recommendation that, until a new system of trainin is introduced, only State-registered nurses should be train as midwives; several training schools now depend on no State-registered nurse candidates.

During 1948, 17,819 midwives notified their intention to practis The total (which has steadily increased from 15,615 in 1942) 419 greater than that for 1947. Of last year's total, 5679 (31 were non-State-registered nurses. The number of women w notified their intention to act as maternity nurses only was 3 The number of pupil-midwives entering first-period train institutions during the year ended March 31, 1949, was 486 less th in the previous year; and the number of second-period pupils by 199. Of the 4025 pupil-midwives entering first-period at schools in 1948–49, 3777 (94%) did so for the reduced period training allowed to State-registered nurses and registered sick children's nurses.

At March 31 this year, 15,897 midwives and pupil-midwive (9094 of whom were in practice in 1948) had been trained in the administration of nitrous-oxide and air analgesia. In pursuit of a recommendation by the Royal College of Obstetricians and Gynæcologists, the board has asked the Home Secretary to amend the Dangerous Drugs Regulations to

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1. Report on the Work of the Central Midwives Board for the year ended March 31, 1949. Published for the board by *Spottiswoode, Ballantyne,* & Co. Ltd., 1, New Street Squar London, E.C.4.
2. Leading article, *Lancet*, Oct. 1, p. 611.
3. See *Ibid*, 1949, i, 190.

THE DOCTOR'S CREED

AN ADDRESS TO MEDICAL STUDENTS *

GEOFFREY FISHER
P.C., M.A., D.D.
ARCHBISHOP OF CANTERBURY

FOR a fully effective life, a man must have a firm, thful. adequate belief about life. Normally a man y, if he likes, borrow it at second hand from the con- ational doctrine of his generation. Today he cannot : there is no established, conventional, generally epted doctrine of life. Truth is fragmented : each ence cultivates its own plot and is a law to itself and mystery to everyone else. Man is fragmented : the onomic man, the industrial man, and the like. Life is strated : for there is no unity of faith and purpose out it. All of us today are compelled, if we think at , to make a deliberate and intelligent choice. For a an, to choose none is to be a nihilist. Each man, erefore, must work for his belief, and not least the edical profession ; for its members are accepted and usted as guides and advisers in much more than atters of health. They touch men's lives at many nsitive points. If priests in their own craft, they are astors too, and they must have a clear, surely based, ctrine of life behind them.

Against this background—may I venture to raise rtain fundamental questions, closely related to aspects the medical profession ?

THREE QUESTIONS

The pursuit of scientific truth, in which you are rained, is a grand, exciting, exacting, and splendid iscipline indeed. There is the acquisition of exact and recise knowledge by observation, experiment, the nspired guess, even by accident. There is the testing f it by applying it and seeing what trial and error teach ou. And then out of it come fresh problems, fresh tudy, and more truth. That is all magnificent and nthralling. On all this I want to make three obvious bservations, which because they are obvious are the more easily overlooked.

1. Scientific truth is discovered, not created by you. It was there before you found it in the universe, whether it be the truth of nuclear energy or of penicillin. What you do is not to create truth, but to find it and use it. From the beginning of time it was there awaiting your discovery—and not only scientific truth, but the laws of reason and principles of intelligence on which it rests. How did it get there ? If that be a mystery, it is not one that we can ignore. There are three possibilities. It got there by accident, which means that Chaos is King ; it got there by an inherent necessity, which is another way of saying that we do not know ; or it got there by the deliberate act of a Mind which put it there. In which case we recognise an affinity between that mind and ours. It is in Creation—how ? There is *a metaphysical question*.

2. Pure science is concerned only with truth and error. But as soon as you put it to use, it involves you in good and evil, and moral values. Pure science produced the atom bomb. That bomb has shaken Japan and mankind. Even more it has shaken the scientists ; for the thing can be used and its use raises moral questions which men cannot avoid. Science cannot be a law to itself : it demands to be subject to a moral control of its uses. Medical science is constantly and increasingly involved in moral problems. Once it was the simple problem of healing disease. But what of—to give one instance only—what of artificial human insemination—with all the complex questions attached to it of personal and family and social well-being ? It is no longer possible to rest quietly in the simple belief that what science or medical science can do, it may do.

Science, or rather the use made of it, must be subject to the moral judgment ; unless, of course, you like to say there is no such thing as a moral judgment. In which case I reply (*a*) you deny the experience of mankind that there is ; (*b*) you don't believe it yourself ; for there are some things you could not bring yourself to do because they are wrong. But if there is a moral judgment—then, since it is to control life, it deserves study and care as thorough as science itself, and not an unscientific, haphazard, and amateur guess. There is *an ethical question*.

3. Both science and the moral judgment are possessions of Man. Man is greater than the things he possesses, prior in thought to them and superior in essence. What is Man that medical science should serve him ? Unless you have a working answer to that—your work will be in the strict sense of the word faithless and futile. And if it is a mystery, all the more reason for seeking the truth of it.

You see and deal with man as a physical body. But you are never unaware that he is something more. What more ? How much more ? You are all compelled, as any pastor is, to be something of a psychologist. What does a man's ψυχή make him ? In the end an ego, a person, or an *Id*—that thing. And if an ego, a person—how far does that take him (and you, for you too are a man) in terms of moral value and of the purpose of his creation ? There is *a personal problem*.

Well, there are three problems or mysteries. Is creation an accident or a design, and if a design, can we read it ? Is the moral judgment an illusion or in truth a reflection of something in the design and a matter of moment ? Is man a person or a thing—and if a person, confined within the physical order, or reaching beyond it, and if so how far ? Neither a man nor a doctor nor a generation can be at peace and purposeful without some kind of an answer.

I ask—is the medical student trained to find the answer ?

And I answer, almost certainly, no.

Why not ? First because this generation has no settled faith, and a medical school would be hard put to it to know what official answer to give or teach. Secondly, because it is not supposed to be their job.

Nor is it quite. And yet it matters intensely that medical students and their seniors should neither ignore these mysteries nor get hold of false answers nor pick up a ragbag of ideas about them, but should know the best that can be known.

THE CHRISTIAN ANSWERS

I shall now tell them and you, in the fewest possible words, what is the answer of the Christian Faith.

1. *Metaphysical Problem*

Creation—its origin and upholding—is not accident, but design ; and that not unconscious design, but the design of God. God is the creator of all things and holds all things living in life, and therefore is relevant to every problem, metaphysical, moral, and personal.

A priest said to a young man of his flock the other day " I am going to ask you a question : I want you to answer it straight off without stopping to think. Would God be able to understand radar ? " And the young man at once said " No." The Christian Faith says " Of course he does ; it is out of his workshop ; and just as he knows all about radar so he knows all about you." There is a metaphysical unity of truth for you !

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* Substance of an address delivered in opening the new session of the university medical school at Birmingham on Oct. 4.

this young college with Cinderella; for was not Cinderella always innocent and good and her two sisters elderly and unpleasant? In the end he likened the college to Aphrodite, who is said to have risen from the waves.

Manx Health Services

Dr. T. Lloyd Hughes, Prof. C. A. Wells, Mr. A. A. Gemmell, and Dr. E. Noble Chamberlain are visiting the Isle of Man to advise on the replanning of hospitals and medical services there.

University College Hospital

The dinner of past and present students of the medical school will be held at the Savoy Hotel, Strand, London, W.C.2, on Friday, Oct. 28, at 8 P.M., when Mr. J. B. Hunter will be in the chair. Tickets (*27s. 6d.*) may be had from the dinner secretary, University College Hospital medical school, University Street, W.C.1.

British Medical Students' Association

The annual general meeting of the association will be held in B.M.A. House, Edinburgh, from Nov. 11 to 13. Mr. P. Eggleton, D.SC., will give the guest lecture. Subjects chosen for discussion will include student health services, clinical conferences, staff-student discussions, further education and training grants, and medical films.

Health and Diet in Old Age

Prof. W. Hobson, of the department of social and industrial medicine at Sheffield University, is directing an inquiry among elderly people into the effects on health of dieting and advancing age. The inquiry is being conducted with help from the Nuffield Foundation, the Social Survey, and the Sheffield Council of Social Service.

Mothercraft Exhibition

This exhibition will be held at Central Hall, Westminster, from Nov. 23 to 30. The National Baby Welfare Council have arranged a conference to be held concurrently. Further particulars may be had from the organising secretary, Universal Exhibitions, 40, Holland Park, W.11.

Infant Milk-foods

Proprietary infant milk-foods and National dried milk may now be had as an alternative to liquid milk for children up to 2 years of age. Since April, 1948, supplies of these foods have been restricted to children up to 1 year of age. Anyone wishing to take advantage of this alternative for a child aged 1–2 years should take or send the child's ration book to the local food office.

Messrs. Sharp and Dohme Ltd., Hoddesdon, Herts, inform us that inquiries for 'Tyrozets' should be addressed to them and not (as stated in their advertisement last week) to Messrs. Boileau and Boyd Ltd., Dublin.

Births, Marriages, and Deaths

BIRTHS

BURNS.—On Oct. 12, in London, the wife of Dr. Stewart Burns—a son.

DOHERTY.—On Sept. 29, the wife of Dr. Michael Doherty—a daughter.

FAWCETT.—On Oct. 8, in London, the wife of Dr. J. W. Fawcett—a son.

FISHER.—On Oct. 8, at Luanshya, Northern Rhodesia, the wife of Dr. A. C. Fisher—a son.

FRANKS.—On Oct. 14, in London, the wife of Dr. L. M. Franks—a son.

GILFORD.—On Oct. 12, the wife of Mr. W. W. Gilford, F.R.C.S.—a daughter.

GREGORY.—On Oct. 8, at Aylesbury, the wife of Mr. T. S. S. Gregory, F.R.C.S.—a daughter.

HART.—On Oct. 8, in London, to Dr. Mary (née Sawday), wife of Dr. Robert Hart—a daughter.

HEBBERT.—On Oct. 5, the wife of Dr. John Hebbert—a daughter.

ISAACS.—On Oct. 8, in Manchester, the wife of Dr. H. D. Isaacs—a daughter.

LLOYD.—On Oct. 7, at Swansea, the wife of Dr. Joseph Lloyd—a son.

MARRIAGES

BROOKES—HUGHES-STANTON.—On Oct. 15, in London, Claud James Brookes, F.R.C.S.E., to Barbara Hughes-Stanton.

CARMICHAEL—DALL.—On Oct. 6, in Edinburgh, A. Brian Carmichael, M.B., to Isabel Dall.

DEATHS

JAMES.—On Oct. 13, in London, Richard Gostwycke James, O.B.E., M.R.C.S.

KYLE.—On Oct. 8, in London, James Kyle, M.R.C.S., air commodore, R.A.F. medical branch (rtd).

WATSON.—On Oct. 15, at Bath, Andrew Gordon Watson, M.D. Edin.

Diary of the Week

OCT. 23 TO 29

Monday, 24th

UNIVERSITY OF LONDON
1.45 P.M. (University College, W.C.1.) Dr. Charity Weym Technique and Applications of Tissue Culture (Firs two lectures.)
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Mr. Terence Cawthorne, Mr. Ian Robin: Deafness.

Tuesday, 25th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. E. S. R. Hughes: Development of the Mam Gland. (Arris and Gale lecture.)
UNIVERSITY OF LONDON
5 P.M. (St. Mary's Hospital Medical School, W.2.) Prof. C. Schmidt (University of Pennsylvania): Physiology *Pharmacology of the Cerebral Circulation.*
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histopathology of the Skin.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
2 P.M. (Postgraduate Medical School of London, Ducane W.12.) Mr. Lawrence Abel: Mammary Cancer in P nancy.
3 P.M. Prof. L. S. P. Davidson: Anæmia in Pregnancy.
EUGENICS SOCIETY
5 P.M. (26, Portland Place, W.1.) Sir Godfrey Thomson, D. Intelligence and Fertility—an Investigation of Scott Children.
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
5 P.M. (University New Buildings.) Dr. Denis Williams: N Orientations in Epilepsy.

Wednesday, 26th

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
11 A.M. (Chelsea Hospital for Women.) Mr. C. S. Gwilli Vaginal Hysterectomy.
NOON. (Prof. E. C. Dodds, F.R.S.: Œstrogens.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 23, Portla Place, W.1
3.30 P.M. Dr. H. E. Magee: Popular Fallacies regarding Hum Nutrition.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. A. Wright Thomson Gyrate Atrophy of the Choroid.

Thursday, 27th

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Desmond Curran: Psychiatry lecture demonstra tion.
INSTITUTE OF UROLOGY
5 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2 Mr. A. E. W. McLachlan: Manifestations of Osseo *Syphilis.*
MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Dame Louise McIlroy: C of Scientific Research in Medicolegal Practice. (Presidenti address.)
HONYMAN GILLESPIE LECTURE
5 P.M. (Edinburgh University New Buildings.) Dr. Bruce Williamson: Diastole.

Friday, 28th

UNIVERSITY OF LONDON
5.30 P.M. (Westminster Medical School, S.W.1.) Prof. V du Vigneaud (Cornell University): Indispensability o Biologically Labile Methyl Groups in the *Diet* and Trans methylation. (First of three lectures.)
MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9
5 P.M. Dr. S. Nevin: Psychiatry demonstration.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.1
8 P.M. Colonel L. W. Harrison: Is Treatment before Diagnosis on Suspicion of Venereal Disease advantageous to the Patient and/or the Public Health?
ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Sir Philip Manson-Bahr: The Dawn of Tropical Medicine (the Life and Work of Sir Patrick Manson).

Appointments

BARRAN, G. F., B.A., M.D. Camb.: whole-time consultant chest physician, King's Lynn and West Norfolk area.
*STEWART, R. H. M., M.D. Lpool: asst. senior M.O., Manchester Regional Hospital Board.

The Hospital for Sick Children, Great Ormond St., London:
ALCOCK, R. J., M.B. Camb.: house-surgeon.
BACK, E. H., M.B. Camb., M.R.C.P.: house-physician.
D'ARCY, JOAN, M.B. Belf.: resident M.O., Tadworth Court.
MITCHELL, R. G., M.B. Edin., D.C.H.: house-physician.
RENDLE-SHORT, T. J., M.A., M.B. Camb., M.R.C.P., D.C.H.: house-physician.

* Amended notice.

CORRIGENDUM: *Clues to the Ætiology of Graves's Disease*—We regret to find that in publishing Professor Means's lecture on Sept. 24 we introduced another error besides the one corrected last week (*capable* for *incapable* on p. 547). In the 5th and 7th paragraphs under Adrenal Cortex (pp. 547, 548) Professor Means is made to refer to *addisonian anæmia* (i.e., pernicious anæmia) when he was in fact speaking of *Addisonians* (i.e., sufferers from Addison's disease). We trust that the error will have been evident to readers.

THE DOCTOR'S CREED

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For a fully effective life, a man must have a firm, thful, adequate belief about life. Normally a man y, if he likes, borrow it at second hand from the con- ntional doctrine of his generation. Today he cannot ; there *is* no established, conventional, generally epted doctrine of life. Truth is fragmented : each ence cultivates its own plot and is a law to itself and mystery to everyone else. Man is fragmented : the nomic man, the industrial man, and the like. Life is ustrated : for there is no unity of faith and purpose out it. All of us today are compelled, if we think at , to make a deliberate and intelligent choice. For a an, to choose none is to be a nihilist. Each man, erefore, must work for his belief, and not least the edical profession ; for its members are accepted and usted as guides and advisers in much more than atters of health. They touch men's lives at many nsitive points. If priests in their own craft, they are stors too, and they must have a clear, surely based, octrine of life behind them.

Against this background—may I venture to raise rtain fundamental questions, closely related to aspects the medical profession ?

THREE QUESTIONS

The pursuit of scientific truth, in which you are ained, is a grand, exciting, exacting, and splendid iscipline indeed. There is the acquisition of exact and recise knowledge by observation, experiment, the spired guess, even by accident. There is the testing f it by applying it and seeing what trial and error teach ou. And then out of it come fresh problems, fresh tudy, and more truth. That is all magnificent and nthralling. On all this I want to make three obvious bservations, which because they are obvious are the nore easily overlooked.

1. Scientific truth is discovered, not created by you. t was there before you found it in the universe, whether t be the truth of nuclear energy or of penicillin. What ou do is not to create truth, but to find it and use it. rom the beginning of time it was there awaiting your iscovery—and not only scientific truth, but the laws f reason and principles of intelligence on which it rests. ow did it get there ? If that be a mystery, it is not ne that we can ignore. There are three possibilities. t got there by accident, which means that Chaos is ing ; it got there by an inherent necessity, which is nother way of saying that we do not know ; or it got here by the deliberate act of a Mind which put it there, n which case we recognise an affinity between that nind and ours. It is in Creation—how ? There is *a* *question.*

ience is concerned only with truth and error. ut as soon as you put it to use, it involves you in good nd evil, and moral values. Pure science produced the tom bomb. That bomb has shaken Japan and mankind. Even more it has shaken the scientists ; for the thing can be used and its use raises moral questions which men cannot avoid. Science cannot be a law to itself : it demands to be subject to a moral control of its uses. Medical science is constantly and increasingly involved n moral problems. Once it was the simple problem of healing disease. But what of—to give one instance only—what of artificial human insemination—with all the complex questions attached to it of personal and family and social well-being ? It is no longer possible to rest quietly in the simple belief that what science or medical science can do, it may do.

Science, or rather the use made of it, must be subject to the moral judgment ; unless, of course, you like to say there is no such thing as a moral judgment. In which case I reply (*a*) you deny the experience of mankind that there is ; (*b*) you don't believe it yourself ; for there are some things you could not bring yourself to do because they are wrong. But if there is a moral judgment—then, since it is to control life, it deserves study and care as thorough as science itself, and not an unscientific, haphazard, and amateur guess. There is *an ethical question.*

3. Both science and the moral judgment are possessions of Man. Man is greater than the things he possesses, prior in thought to them and superior in essence. What is Man that medical science should serve him ? Unless you have a working answer to that—your work will be in the strict sense of the word faithless and futile. And if it is a mystery, all the more reason for seeking the truth of it.

You see and deal with man as a physical body. But you are never unaware that he is something more. What more ? How much more ? You are all compelled, as any pastor is, to be something of a psychologist. What does a man's ψυχή make him ? In the end an ego, a person, or an *Id*—that thing. And if an ego, a person—how far does that take him (and you, for you too are a man) in terms of moral value and of the purpose of his creation ? There is *a personal problem.*

Well, there are three problems or mysteries. Is creation an accident or a design, and if a design, can we read it ? Is the moral judgment an illusion or in truth a reflection of something in the design and a matter of moment ? Is man a person or a thing—and if a person, confined within the physical order, or reaching beyond it, and if so how far ? Neither a man nor a doctor nor a generation can be at peace and purposeful without some kind of an answer.

I ask—is the medical student trained to find the answer ?

And I answer, almost certainly, no.

Why not ? First because this generation has no settled faith, and a medical school would be hard put to it to know what official answer to give or teach. Secondly, because it is not supposed to be their job.

Nor is it quite. And yet it matters intensely that medical students and their seniors should neither ignore these mysteries nor get hold of false answers nor pick up a ragbag of ideas about them, but should know the best that can be known.

THE CHRISTIAN ANSWERS

I shall now tell them and you, in the fewest possible words, what is the answer of the Christian Faith.

1. Metaphysical Problem

Creation—its origin and upholding—is not accident, but design ; and that not unconscious design, but the design of God. God is the creator of all things and holds all things living in life, and therefore is relevant to every problem, metaphysical, moral, and personal.

A priest said to a young man of his flock the other day " I am going to ask you a question : I want you to answer it straight off without stopping to think. Would God be able to understand radar ? " And the young man at once said " No." The Christian Faith says " Of course he does ; it is out of his workshop ; and just as he knows all about radar so he knows all about you." There is a metaphysical unity of truth for you !

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* Substance of an address delivered in opening the new session of the university medical school at Birmingham on Oct. 4.

2. Ethical Problem

The moral judgment deals with realities (partially known as all realities are) because it *derives from God.* The Good really is good because it corresponds with the being of God, and Evil really is evil *because it conflicts* with the Perfection of God—*and thank God for that.* It really would be ghastly if at the heart of *everything* there really was no difference between the two, or even if Evil was God—*the ultimate sovereign.*

And the Christian Faith then does two things *more for* us: first it trains us to judge moral questions, our own and other people's, *not by our own ideas but by what* God has revealed of His *Ideas*; and like any good *educationalist, God does not say "There's the answer at the end of the book," but "Here are the principles. Work it out for yourselves and I will help you."*

Secondly, the conflict of good and evil is real to God and to us. The process of overcoming evil with good is unceasing. Every man helps or hinders. Moral judgment is not an intellectual exercise but a personal *commitment to a share in the battle.*

3. Man

What is Man? The Christian Faith says, on our side, from our end, Man is a being who "has *the capacity to* hear *the* word of God and respond to it," and, from God's side, Man is the object of God's love, as God has shown in His own acts. *Hence flow all the doctrines of the Christian Faith.* So we *believe in the Incarnation.* So we can believe in a personal *commitment of God through the Incarnation, physical defeat, and Bodily* Resurrection. He did what we can believe, but could never believe *had he not done it. And* Man's part is to hear what God has done and respond to it. *That is all* I can say without making this more *of a sermon than* it is already.

So far has my consideration of the scientific aspect of medicine brought me. I have said *these things to* medical students, because they touch their profession closely. Many medical students don't often hear them and still less *often think of them. Yet* as a hypothesis, they have as much to be said for them as any medical hypothesis, and no-one has a right to look askance at them, *until he is quite certain that he has a better* hypothesis which will better equip him for his life and for his work.

SOCIAL AND PERSONAL ASPECTS OF MEDICINE

In what is left of my time may I hurriedly refer to two other aspects of medical work.

1. The Social Aspect

Here the Church and the medical profession ought to have sympathy for one another, for both of us now are "established," in a measure. You draw part of your salaries from the State; we draw not a penny piece from the State. But you and we have a State connexion. We are intimately involved in the Welfare State and work for its welfare, and—and this is the point I want to make—we both insist that that State connexion shall leave us absolutely free to deliver the truth that is in us—to care for persons, and for their true health, by our own highest standards.

And why? We are here to serve our people. We have and recognise our obligation to society. We intensely believe in the Welfare State, in the sense of a State which serves the true welfare (as we may see it) of all its people and does all to help it. Yet we *look* beyond and above the State for our principles. They are sacred. You have your medical creeds, and there is the Christian creed. They are sacred and cohere because they are both of God and not of man.

2. The Personal Aspect

When all is said and done—about scientific approach and social service—the end of science and of *society is Man in himself and in his social relations.* That is the whole point of the struggle against totalitarianism. Man and the family have their indefeasible rights and dignity which may not be overridden or denied, because they are not the result of sociology or State law, but are of God *and to be respected by Man. And your job* and mine is *to serve Man* in his own person and in his family, relieving *his distresses of body* and soul, preserving him in health *of body, mind,* and soul because he is not an *Id*, or an *average, or a bit of statistics,* but a fellow creature bound to us and we to him as members one of another *in the family* of God whose nature is Love. Body and soul are closely allied. The parson has his job with the souls of *men* but *again* and again he can't do it without help of the doctor. The doctor has his job with the bodies of men, but again and again he cannot do it without the *help of a priest.* That is being rediscovered. We cover the same ground and belong to one another, as from the beginning of the Christian era we always have. The blessed doctor is the general practitioner *He sees and knows not a case,* but a person; not a person sole, but a person in his family. He is the family doctor. Nothing in State service must destroy that. Consultant specialists are a degree more remote (like bishops!): and therefore (again like bishops) they need a double dose of Grace to keep them sensitive to the personal and *pastoral.*

THE DOCTOR'S CREED

And this last word: if doctor and priest are covering the same ground with their complementary prescriptions, the doctor needs to be anchored to a Faith as good and compelling, true and exacting, as that of a priest. For he has to *deliver the goods—spiritual* as well as physical He must have a creed that impels him to value, care for, respect each *man, and if he is to* have that, it must be a creed which governs *him himself.* For I believe that what *men look for* and need and pray for in a doctor is something over and above his skill in medicine. It is *a sure touch—in the things* of the *spirit.* And as I have said, no man has the right to reject or by-pass the Christian Faith unless and until by prayer and fasting he *has convinced himself* of a Faith truer, better, and which exacts more and not less from him.

TOPECTOMY

THE TREATMENT OF MENTAL ILLNESS BY FRONTAL GYRECTOMY OR BILATERAL SUBTOTAL ABLATION OF FRONTAL CORTEX[*]

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TOPECTOMY (from τόπος, a place, region, or part, and ἐκτομή, a cutting out) is an operation used for treating mental illness (Pool et al. 1949). It can equally well be described as frontal gyrectomy (Penfield 1947) or bilateral subtotal ablation of frontal cortex (Heath and Pool 1948).

Burckhardt in 1890 reported encouraging results of limited unilateral ablation of temporal and frontal cortex in a few psychotic patients. Later Moniz (1936) introduced bilateral frontal leucotomy, which was subsequently modified by Freeman and Watts (1942), Scarff and Kalinowsky (1947), Poppen (1948), and others. In the laboratory Fulton and Jacobsen (1935) were among those who demonstrated the effects on behaviour of bilateral ablation of frontal cortex, and Mettler in

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[*] With notes on postoperative epilepsy, cerebral circulation, autonomic effects, thalamic surgery, and speech. Lecture delivered at the Institute of Neurology (National Hospital, Queen Square, London, W.C.1) on Aug. 26.

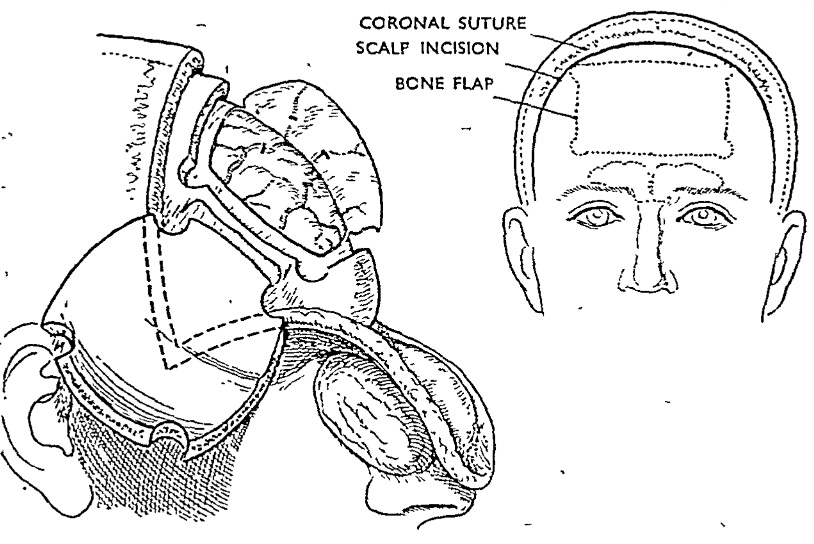

Fig. 1—Scalp incision, bone flap, and dural opening for topectomy.

44 suggested that behaviour changes in laboratory imals were associated particularly with bilateral moval of Brodmann's area 9. For this reason, in our iginal topectomy operations an effort was made to cise at least a portion of what we believed to be rodmann's area 9 (Heath and Pool 1948). My associates, r. Robert G. Heath and Dr. John Weber, and I felt hat such an operation could safely be done.

Our reasons for doing topectomies instead of lobotomies ere as follows:

(1) We hoped that relatively small cortical ablations ould prove more specific as regards the site and extent of he lesion and might therefore yield equally good therapeutic esults without as much cerebral dysfunction.

(2) We hoped that by purposely varying the site and xtent of cortical excisions valuable information might be btained about the rôle of various portions of the frontal obes in mental illness.

(3) We expected that special studies during these operations ould shed light on still other facets of frontal-lobe functions.

How far these hopes were realised will, I hope, be revealed below.

The first topectomy was performed in 1946 (Heath and Pool 1948), and early in 1947 an elaborate study of various types of topectomy or bilateral frontal gyrectomy was conducted (Columbia-Greystone Associates 1949). In my opinion this preliminary work indicated that the best therapeutic results were obtained in those patients from whom cortex was removed bilaterally in the region of Brodmann's areas 9 and 10. Accordingly the topectomy operation as subsequently done by me has been largely confined to symmetrical excision of cortex from the rostromedial portion of each frontal lobe, presumably representing parts of Brodmann's areas 9 and 10.

Later Penfield (1947) described, without enthusiasm, the results of a somewhat similar operation called frontal gyrectomy. However, his experience seemed to parallel ours to the extent that he also noted adverse personality changes when the surgical lesions extended too far posteriorly—i.e., caudal to the plane of the coronal suture. Moreover, in one case of Penfield's showing significant postoperative improvement the cortical ablation was quite similar to that currently used in topectomies.

SELECTION OF PATIENTS FOR TOPECTOMY

The first 52 patients on whom topectomy was done have all been observed for more than a year, and some for nearly three years. Though most of them were private patients, little effort was made in this initial series to select cases according to the severity of their illness or to their prognosis. In general, essentially the same criteria were used in selecting cases for topectomy as for lobotomy (Scarff and Kalinowsky 1947, Poppen 1948), the operation being reserved with few exceptions for those cases in which psychotherapy, shock therapy, and sometimes psycho-analysis, had failed.

In the light of our total experience with this operation it now seems clear that topectomy is less radical than the so-called standard prefrontal lobotomy (Freeman and Watts 1942) as regards the amount of frontal lobe sacrificed, and more radical than transorbital lobotomy (Freeman 1948). This is an impression that may serve as a further guide in the selection of patients for topectomy.

PREOPERATIVE AND POSTOPERATIVE STUDIES

Before operation all patients were subjected to a physical, neurological, and psychiatric examination, a complete blood-count, blood-Wassermann test or its equivalent, analysis of urine, and sometimes other special studies. Electro-encephalography, radiography of the skull, and psychometric studies were also done whenever possible. After operation an effort was made to repeat these tests.

ANÆSTHESIA

Anæsthesia consisted of intravenous thiopentone sodium, supplemented by nitrous oxide/oxygen by inhalation through an intratracheal tube, and local infiltration of the scalp with 1% procaine solution.

OPERATION

All operations were carried out in one stage. A coronal type of scalp flap was reflected anteriorly, and a single bone flap hinged on the right temporal muscle was turned, crossing the midline so that both frontal lobes could be exposed. The posterior edge of the bone flap was cut close to or just anterior to the coronal suture, the anterior edge being cut as far forward as the frontal air sinuses permitted (fig. 1). Laterally each flap extended 4–4·5 cm. from the midline. Though four burr-holes were usually sufficient, in cases with an unusually thin or adherent dura additional burr-holes were made in the midline posteriorly and anteriorly so that the dura could be separated from the bone without undue tearing. After bleeding from the dura had been controlled with the electrocautery, a dural flap was opened over each frontal lobe. The superior cerebral veins were next divided between silver clips or by cauterisation so that the cortex could be exposed medially on each side along the falx cerebri (fig. 1).

Resection of Cortex

A block of cortex was excised symmetrically from each frontal lobe, beginning about 2 cm. anterior to the junction of the coronal and sagittal sutures and extending laterally for 3·0 to 3·5 cm., anteriorly 5·5–6·0 cm., and in depth 1·9–2·0 cm.—i.e., to the depths of the grey matter but no deeper (fig. 2). The site and extent of resections were also checked with reference to readily recognisable landmarks, such as the tip of the frontal pole, the sylvian, frontal, and precentral fissures, the falx, and the sphenoid ridge. In some cases the motor cortex was electrically stimulated also. Resection was greatly facilitated by first occluding the major arterial channels supplying the designated block of cortex, by placing silver clips on the appropriate branches of the anterior cerebral arteries medially, near the inferior margin of the falx. The cortex was then removed easily either by a subpial suction technique or simply by incising to a depth of 1·9 cm. with a scalpel blade at right angles to the surface of the cortex. Further hæmostasis was accomplished with silver clips or the electrocautery, both methods having been used, usually in combination. In earlier cases the cortex was resected chiefly with interrupted black silk ligatures passed through the cortex on curved needles, but this technique was soon discontinued.

It was sometimes necessary or advisable to complete the removal by slightly undercutting the margins of the excision with gentle suction, especially anteriorly if large frontal sinuses prevented adequate exposure. After the cortical incision had been made, a slightly curved spatula was employed to undercut the block of cortex and thus complete its removal. The edges of the cavity were next made smooth and even with a small-calibre suction tip. Each block of cortex thus removed should weigh about 25–30 g. in the fresh state. In a psychotic patient anything less than this amount usually proved therapeutically ineffective. However, Le Beau et al. (1948), who have used this type of operation to relieve intractable pain, feel that in the non-psychotic patient removal of only 15–20 g. from each side is sufficient, and that more than this may induce permanent undesirable personality changes. In a word, the quantity of cortex removed seems a most important factor.

Closure

In every case the cerebral cavities caused by the operation were lined with a thin layer of 'Hemopak' (an oxidised cellulose prepared by Johnson & Johnson Ltd.) and filled with 5 ml. of a dilute solution of penicillin 1000 units per ml. The dural flaps were next closed in watertight fashion, and the bone flap replaced and anchored with periosteal sutures. The defects created by the anterior burr-holes were usually closed with tantalum discs (fig. 3). In some cases the opening and closing of the scalp incision was facilitated by the use of ordinary 'Zipp' fasteners instead of sutures—a technique developed by the author. A snug head dressing was then applied, well reinforced in cases where postoperative violence might be expected.

POSTOPERATIVE COURSE

The usual postoperative course of the topectomy patient differed considerably from that of the patient who had undergone a standard prefrontal lobotomy. The topectomy patient tended to be less depressed and disoriented, especially during the first 24 hours after operation, and most of them recognised their friends and family, read the papers, and ate during the 1st postoperative day; while some even walked about, and did picture puzzles. From the 2nd to the 5th postoperative day, and sometimes longer, the post-topectomy patients often showed an exacerbation of their preoperative psychotic symptoms. This tended gradually or sometimes abruptly to subside, with the result that the patient could be discharged by the 10th–14th day. Generally a convalescent period with psychotherapy in a nursing-home was advised for 4–8 weeks before returning the patient to his home. Significant improvement, when it occurred, was usually manifest by the 3rd postoperative month, though some further improvement often took place during the following 3–4 months.

PATHOLOGY

Though in many cases the exposed cortex appeared grossly abnormal, showing atrophy, unusual firmness, or apparent abnormalities of the vascular pattern, there was no obvious correlation between the gross or microscopic appearance of the cortex and the type of psychosis, its duration, or the amount of shock treatment administered (Pool et al. 1949). It did seem, however, that the dura was often exceptionally vascular in most patients who had recently undergone extensive shock treatment.

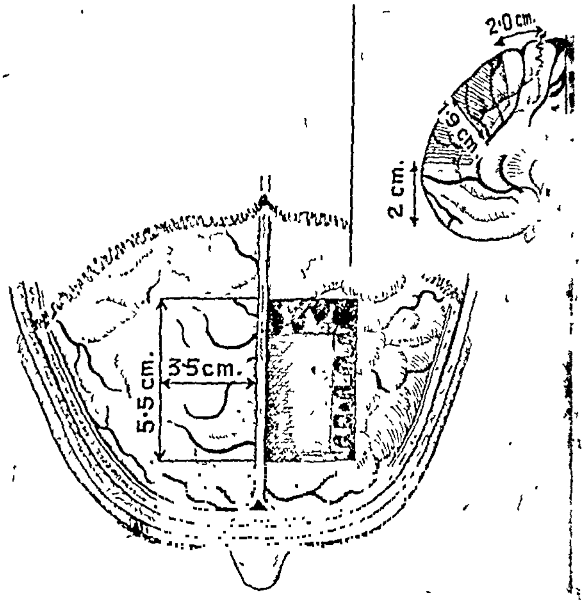

Fig. 2—Amount of cortex ordinarily removed. Somewhat more than this should be removed in chronic schizophrenics, and considerably less for relief of pain.

COMPLICATIONS

Postoperative hæmorrhage occurred in 2 cases, and was successfully treated by prompt re-elevation of the operative flap and evacuation of the hæmatomata. Temporary incontinence of urine occurred in about a third of our patients and lasted for an average of 10 days. In no instance was the incontinence permanent. Retention of urine occurred in 5 cases and likewise was not permanent.

MORTALITY

In this series of private and ward patients, and in another consecutive series making a total of more than 125 topectomies so far done by me, there has not been a single death from the operation.

ELECTRO-ENCEPHALOGRAPHY AND CONVULSIONS

In these patients there were no significant preoperative abnormal appearances in the electro-encephalogram (E.E.G.). For 10–28 days after operation most, but all, patients had focal E.E.G. disturbances in the and sometimes adjacent regions, and a few for than this. In most cases the E.E.G. was within limits by the 4th postoperative month. However, those who subsequently had generalised convulsions, a few presented no abnormality in their postoperative E.E.G. pattern before the onset of the convulsions. Of these 52 patients 7 had two or more attacks of postoperative convulsions. Two others may have had one attack each, but the reports on these two cases did not specify this. Thus the known incidence of convulsions was about 14% and possibly nearly 18%. This is higher than the incidence of convulsions after lobotomy, which in some series is reported to be about 10–12%. Fits generally occurred for the first time 4–6 months after operation, with sudden loss of consciousness followed by tonic-clonic contractions, without any aura or focal

In our cases, however, attacks were controlled odium phenytoin and phenobarbitone, provided the were faithfully taken. All the patients who had lsions had a dynamic type of personality: there no convulsions in patients of the "flat" or hebetic type. There seemed to be no correlation between iagnosis, prognosis, or age of the patient and the of fits. Their incidence was slightly higher among arly cases in which the cortex had been ablated silk ligatures, but 2 patients in whom the subpial ique was used (without sutures) also had convul- Excessive use of the electrocautery, however, ed a definite predisposing factor.

the cases developing fits the lesions bordered closely he cingulate gyri (area 24) and presumably on 8 if not 8s, which may be significant in view of ie Russell's interesting hypothesis that post-natic convulsions seem to occur most often in the nce of injury involving supposed suppressor zones e cerebral cortex (Russell 1947).

CORTEX AND E.E.G. AT SECOND OPERATION

7 cases of this series a second operation was done months after an initial topectomy which failed, for urpose of removing more cortex from areas 9 and 10. ach case the dura was found to be lightly adherent e cortex for 1–2 cm. all round the previous excision. nearly 1 cm. round the scar the presenting surface he cortex looked slightly yellow. The site of the ious excision was marked by a rather shallow ession with a smooth glistening lining. Electrical rdings were made with special bipolar electrodes 5 cm. apart, connected to a three-channel inking amplifier. The operations were done under pentone sodium and nitrous-oxide-oxygen anæsthesia. ler these conditions no abnormalities in the electrical vity of the cortex could be detected when electrodes e placed at various points within 1·5 cm. of the edge the cortical scar or at distances up to 4·5 cm. from scar.

n resecting more cortex and subjacent white matter, e increased resistance was noted on cutting tissue hin 1 cm. of the previous scar, but the underlying ite matter seemed macroscopically normal in all but case. In this case microscopy showed a moderate use astrocytosis for a distance of 1 cm.

CEREBRAL CIRCULATION

In some cases the distribution of some of the frontal nches of the anterior cerebral arteries was tested. ore cortical ablation, by injecting the vessels with a r drops of sterile solution of methylene-blue. By this ans it was possible to demonstrate clearly that a rtial overlap of the circulation existed between adjacent anches of the anterior cerebral arteries, and between them and some of the neighbouring tributaries of the middle cerebral artery, illustrating how collateral circulation in the cerebral cortex may take place.

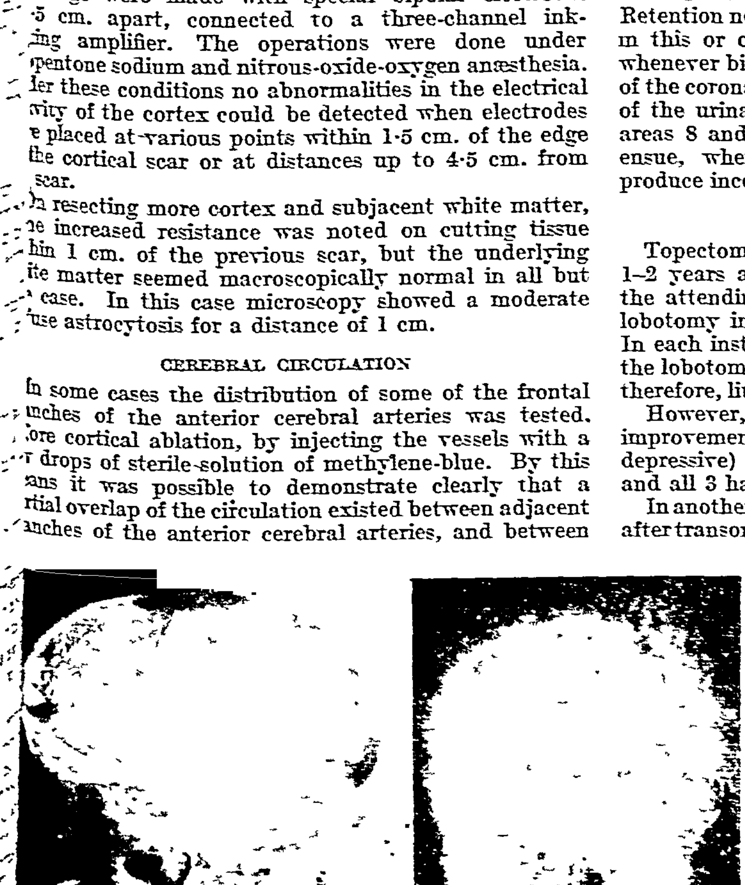

Fig 3—X-ray photographs showing silver clips marking site of ablation of cortex, and tantalum discs inserted into anterior burr-holes for cosmetic reasons.

In 7 cases not included here, frontal and prefrontal branches of the anterior cerebral arteries were clipped with silver clips bilaterally, in the hope of inducing ischæmic changes in that part of the frontal cortex usually excised during topectomy. In 5 patients with an intractable reactive or involutional depression so treated improvement followed operation, though no cortex had been either incised or excised. None of them had convulsions, though all showed temporary E.E.G. changes for 3–4 months in both prefrontal leads. Though this seems a promising and simple operation it is not recommended, because of the possibility that a collateral circulation will develop.

In another small series of psychotic cases, at the request of a group of psychiatrists, the operation was confined to ligation of the superior cerebral or cortico-dural veins over each frontal lobe. This produced no psychiatric improvement but was followed by a relatively high incidence of convulsions, and hence is decried. It is mentioned here to indicate that venous ligation of this kind may be a factor in the production of postoperative convulsions in some topectomy cases.

DYSFUNCTION OF URINARY BLADDER

Of the 52 cases in the topectomy series 5 early ones developed transitory postoperative urinary retention requiring one or more catheterisations. In each of these cases the cortical ablation had extended into what was believed to be the caudal portion of Brodmann's area 9. Retention never followed more anteriorly placed ablations in this or other series, while incontinence was the rule whenever bilateral ablations extended caudal to the plane of the coronal suture. This suggests a dual cortical control of the urinary bladder such that, when cortex close to areas 8 and 6 of Brodmann is removed, retention may ensue, whereas more caudal cortical lesions usually produce incontinence.

TOPECTOMY AFTER LOBOTOMY

Topectomy has been done in 3 schizophrenic cases, 1–2 years after prefrontal lobotomy, at the request of the attending psychiatrists on the supposition that the lobotomy incision might not have been properly made. In each instance, however, it was seen at operation that the lobotomy had been well done. As might be expected, therefore, little improvement followed a second operation.

However, topectomy has been followed by considerable improvement in 3 patients (2 schizophrenic and 1 manic-depressive) in whom transorbital lobotomies had failed, and all 3 have been discharged to their homes.

In another 3 patients who had not improved significantly after transorbital lobotomy a modified topectomy was tried, to see what rôle corticocortical connexions might play. In these 3 cases no tissue was removed. Instead, an incision was made 2 cm. deep in each frontal lobe all round the area of cortex that would have been excised by topectomy. Thus far relatively little change has taken place, which confirms the theory that cortico-subcortical rather than intercortical connexions must be severed in frontal operations to secure clinical improvement.

In some cases in which part of the cingulate gyri or the frontal poles were also deliberately removed there seemed to be little difference in the postoperative behaviour from that in cases in which these regions had not been ablated. This is another reason why the standard topectomy (as currently practised by me)

RESULTS OF TOPECTOMY

Type of patient	No. of cases	0 Not improved	1 Slightly improved	2 Moderately improved	3 At home or working but somewhat unstable	4 *At home*, working, and socially rehabilitated
Schizophrenic:						
Paranoid ..	20	9	1	2	4	4
Hebephrenic	7	2	2	2	..	1
Catatonic ..	3	2	..	..	..	1
Mixed ..	8	1	..	1	2	4
Total schizophrenic ..	38	14	3	5	6	10
		14	8		16	
Depressive:						
Agitated ..	2	..	..	1	..	1
Involutional	3	..	..	1	1	1
Reactive ..	2	..	..	2	..	..
Obsessive-compulsive	2	..	..	..	1	1
Manic-depressive:						
Manic ..	2	1	..	..	..	1
Depressed ..	1	..	..	..	..	1
Psychopathic ..	2	1	..	1	..	..
Total non-schizophrenic	14	2	..	5	2	5
		2	5		7	
Total ..	52	16	13		23	
Percentage ..	..	31	25		44	

has been limited to removal of the rostromedial portions of what is believed to represent Brodmann's areas 9 and 10.

In 2 schizophrenic patients in whom lobotomy had failed, slight improvement followed unilateral incision of the anterior thalamic nucleus, and in 2 others some temporary improvement followed bilateral surgical incision of the dorsomedial nuclei of the thalamus.

AUTONOMIC EFFECTS

After Cortical Ablation

During the investigation (Columbia-Greystone Associates 1949), in which various parts of the frontal lobes were excised, pronounced temporary autonomic effects were observed after bilateral subtotal removal of the cingulate gyri (area 24 and part of area 32) and in 2 other cases after bilateral excision of area 44.

Ablation of the cingulate gyri led to several bouts of violent retching, with two episodes of fæcal vomiting. The extremities, which were cold, wet, and clammy before operation, were warm, dry, and pink during the first 2–3 postoperative weeks, but there were no significant alterations of blood-pressure, pulse, or respiration.

Bilateral removal of cortex of the inferior frontal gyri immediately anterior to the foot of the precentral sulci in 2 other cases was followed by temporary emesis and diarrhœa in one, and retching and profuse salivation in the other. In these 2 cases motor aphasia did not follow the bilateral removal of area 44 (presumably representing a part at least of Broca's area), but dysarthria and some facial weakness were observed in one of the cases. These findings are in keeping with the views expressed by Moutier (1908) and others that motor aphasia need not follow lesions involving the so-called area of Broca but is associated rather with deeper lesions.

Associated with Stimulation

In 15 cases in which a standard topectomy was done the rostral cingulate cortex (area 24) was stimulated electrically, and in 1 case mechanically. Significant alterations of blood-pressure and of the cardiac and respiratory rates were observed singly or in combination in every one of these cases, as described by Pool Ransohoff (1940). These autonomic effects are to those reported by Smith (1945), Ward (1948), (1947), and others on stimulation of the rostral cing cortex in animals, and confirm for the first time the that the rostral cingulate cortex in man is analog in function to that of other species.

RESULTS OF TOPECTOMY

In the 52 cases of topectomy involving areas 9 of Brodmann all postoperative results were by my psychiatric colleagues and not by me. A of 4 represents the best results from all points of 3 represents significant improvement, 2 only improvement, and so on, as indicated in the acc table. It is apparent from this table that sig improvement followed in 44% of the topectomies

In the case of the patients who gave the best resu their families, and the patients themselves often st that their emotional and intellectual capacity is the sa as it was before the onset of their illness. One man, w had been unable to work for eight years, was rece kept at his job as a skilled electrician, though seve others in the shop were discharged because busine had slackened. Another, a Government tax expert, ha been promoted since his topectomy. One woman ha been paid handsomely for a magazine article she wro after her topectomy; another has been retained as secretary despite two attacks of convulsions; and Musical and artistic skills are preserved, and busines have returned to their usual office work. One fami wrote that, since topectomy, their mother had becom "100% perfect, with interest in and love for her famil the capacity to act as hostess at dinners, &c., where she had never spoken a single word to her family fo ten years." Some patients, however (but not all even though clinically improved, tend to show distracti bility and fatigability after operation, especially th schizophrenics.

Psychometric studies a year or more after topectomy have shown an improved intelligence quotient, less rigidity of ideas, and evidence of greater social adaptations compared with the preoperative condition.

When improvement took place it almost always became manifest within three months after topectomy. Of those patients who showed significant improvement only 2 have relapsed during the follow-up period of from one to nearly three years.

In 7 of the 52 patients additional cortex from the rostromedial portion of each frontal lobe (area 10) was removed at a second operation, because the first operation, presumably too conservative, had not been beneficial. Of these 7, 4 who were schizophrenic did not improve after their second, more extensive, operation. However a second operation on 1 schizophrenic, 1 obsessive-compulsive, and 1 depressed patient produced considerable improvement. In general, it seems that, if the schizophrenic patient does not improve after a standard topectomy, removal of more cortex, or even lobotomy, will seldom help appreciably.

DISCUSSION

Compared with frontal lobotomy, topectomy takes longer to perform (two or three hours) and leads to a higher incidence of postoperative convulsions. However, there have been no deaths due to topectomy in 125 consecutive cases done by me. Topectomy apparently causes less dysfunction of the frontal lobes than does the usual lobotomy and is perhaps more precise as regards the location and estimated extent of the surgical lesion.

Another advantage, according to our impression, is that after topectomy the emotional and intellectual capacity is apt to be better preserved than after lobotomy, hat, with 2 possible exceptions, none of our patients to have been made worse by topectomy.

ny topectomy, or any type of psychosurgery, is ive, we do not know. However, several points l out. First, it seems to be well established that ition on the prefrontal portion of the frontal lobes sential. Whether there is an optimum zone for cal removal or disconnexion within the prefrontal remains to be shown.

e quant ty of cortex removed seems to be as important ie site of its removal. As a general rule, less cortex be excised in non-schizophrenic patients than in ophrenics, just as still less need be removed in non-hotic patients—e.g., for the relief of pain. In many nically deteriorated schizophrenics it seems that, natter how extensive the operation, no improvement es.

nally, it looks as though we may have to direct operation in some categories of psychotic pat ents abcortical (rather than frontal) structures, such as hypothalamus and the anterior or dorsomedial ei of the thalamus, as Spiegel et al. (1947) have l.

SUMMARY

he operation of topectomy (frontal gyrectomy or otal bilateral ablation of frontal cortex) is described.

he indications for topectomy are essentially the e as for prefrontal lobotomy. The selection of cases be influenced to some extent by the fact that ectomy seems to be less radical than prefrontal otomy but more radical than transorbital lobotomy.

he disadvantages of topectomy are the relatively i incidence of postoperative convulsions (14% in this es) as compared with 10–12% after frontal lobotomy; the fact that the operation takes longer.

he advantages of topectomy are a mortality-rate 125 cases) of zero; better localisation of the lesion a better estimation of its extent; less risk of serious toperative personality changes; and a better oppor-ity for studying the functions of the frontal lobes.

utonomic effects following cortical ablations and gulate stimulation are mentioned, and effects on the ulation are described.

Both the site of the cortical ablation and, more ecially, its quantity are important factors in deter-ning the success of topectomy.

About 44% of all topectomy patients have maintained nificant improvement for periods of from one to nearly ee years after operation.

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SELF-ADMINISTERED ANALGESIA IN LABOUR

WITH SPECIAL REFERENCE TO TRICHLORETHYLENE

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There are many ways of relieving the pain of labour. A common practice in this country is to combine general medication with intermittent inhalation analgesia. With general medication, the interests of mother and baby are mutually antagonistic. Pain relief is obtained at the expense of respiratory depression of the infant. Intermittent inhalation analgesia is particularly useful in the few hours immediately preceding delivery; the mother is free of drug action between uterine contractions (which occupy only about a quarter of the time), and moreover the inhaled gases are not likely to interfere with the establishment of the baby's respiration. Another advantage is that the gas mixture may be self-administered and so provide the mother with something to do at a time when her passive rôle in the first stage of labour is becoming difficult to play. The importance of this factor is demonstrated from time to time, when a mother attests to complete relief from pain though unwittingly using apparatus which by error delivers air only.

Yet another advantage of inhalation analgesia, as compared with local or regional analgesia for instance, is that it can be supervised by the midwives, and is suitable for almost any case. Nevertheless there are disadvantages: use of a face-mask often leads to uncomfortable dryness of the mouth, probably due to mouth-breathing; intermittent analgesia does not relieve the continuous backache which is sometimes worse than the pain of contraction; and self-administered analgesia becomes a burden to the mother if it is the sole means of pain relief in prolonged labour.

MANAGEMENT OF SELF-ADMINISTERED ANALGESIA

The early stages of labour can be made comfortable with analgesic and sedative drugs. The place of intermittent inhalation analgesia is towards the end of labour, during a period which includes the most painful phases—namely, the end of the first stage and actual delivery. Correct administration is essential if relief is to be effective, and may be attained by instruction in the use of apparatus before labour begins and careful supervision when it is in progress. The mother's confidence will be lost unless she understands what is going on in labour. She must appreciate the fact that, though pain is relieved, awareness of visceral sensations such as pressure will be retained. As for the gas mixture to be inhaled, there is merit in a mixture of constant composition from an apparatus which needs no adjustment. This applies even in institutions where medical assistance is always to hand, for it eliminates the need for constant medical supervision. Though in theory the anæsthetic requirement of patients is variable, in practice a constant mixture carefully chosen gives very good results. If pain relief is not adequate the mixture can be reinforced by a very small dose of analgesic drug. A 50% nitrous-oxide air mixture is widely used, but in spite of careful administration, even this concentration does not always give the measure of relief desired. Depressing drugs have then to be used in at least moderate dosage and the gas loses much of its safety value with regard to the baby.

A careful study has been made of anæsthetic mixtures suitable for intermittent self-administration. The requirements are (1) a rapid onset of effect, (2) a rapid elimination of the gas between inhalations, and (3) the possibility of continued use for 4–5 minutes (at delivery) without taking the average patient into the stage of uninhibited reaction or full anæsthesia. There is usually about 15 seconds' interval between the beginning of a uterine contraction and the development of pain from it; so analgesia should be obtained within 15 seconds, which allows 6 comfortable deep breaths. The apparatus should deliver a mixture which remains constant irrespective of the patient's breathing, for the respiratory activity of women in labour varies greatly both in rate and depth, the variation being an expression both of the emotional state of the woman and of the intensity of the pain stimulus.

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COMPARISON OF ANALGESIC MIXTURES

In the present investigation, a comparison of three anæsthetic mixtures by one observer has been made by close observation of their use in labour. The mixtures were the 50% nitrous-oxide/air—permitted by the Central Midwives Board; a 75% nitrous-oxide/25%-oxygen mixture; and a 0·5% trichlorethylene/air mixture. These percentages are expressed as volume/volume, and the strengths mentioned were adopted in consequence of previous trials. The gas-air apparatus used was either the 'Jecta' or the new Minnitt. The gas-oxygen apparatus was that designed by Andreas Warming of Copenhagen, experience with which has already been reported elsewhere (Royal Society of Medicine 1949). In this intermittent-flow apparatus, nitrous oxide cannot be inhaled if the oxygen supply fails. The trichlorethylene/air apparatus was an experimental one in which compensation is made for changes in temperature. With the last two apparatuse , changes in respiratory minute volume cause negligible changes in the composition of the mixture.

A planned investigation on 150 cases was made of the efficiency of these three mixtures, comparing two in any one labour. Each subject for the investigation received two in successive trial periods of about half-hour each near the end of the first stage of labour, when contractions were strong and regular. On account of the variable factors involved, two series of cases were observed for each pair of mixtures, one mixture being given first in one series and the other mixture first in the control series. Each subject was asked, after a fair trial of each mixture, which was more effective in relieving the pain of uterine contraction. The results were:

		Better		Equal
Nitrous-oxide/air ..	Nitrous-oxide/oxygen	0	49	1
Nitrous-oxide/air ..	Trichlorethylene/air	0	45	5
Nitrous-oxide/oxygen	Trichlorethylene/air	14	12	24

It is clear that nitrous-oxide/oxygen and trichlorethylene/air are both better than nitrous-oxide/air, and that nitrous-oxide/oxygen and trichlorethylene/air are about equally effective.

This trial was followed by observation of a comparable series of labours in which nitrous-oxide/air and trichlorethylene/air were used. Cases were selected at random, the criterion for inclusion in the series being a reasonable prospect of normal labour. Management was uniform in that there was no antenatal instruction in analgesia but careful instruction when administration was commenced. Almost all patients received some other drug as well as the inhaled mixture; these drugs were given in the early stages of labour, followed by inhalation analgesia beginning at half to three-quarters dilatation of the cervix, and further doses were given in the case of inadequate pain relief or requiring sedation. A concurrent series in nitrous-oxide/oxygen was used is not comparabl it was given mainly for abnormal labour. T observations were made:

—	Number of cases	Parity		Analgesia						Other drugs			Compl of labou
				Adequate			Inadequate						
		Primiparæ	Multiparæ	Primiparæ	Multiparæ	Total	Primiparæ	Multiparæ	Total	C	P	H	P.P.H.
Nitrous-oxide/air	100	81	19	32	10	42	49	9	58	80	73	5	5
Trichlorethylene/air	100	75	25	68	23	91	7	2	9	50	47	7	3

P.P.H. = post-partum hæmorrhage of 20 oz. blood or more.

Asphyxia = failure to establish regular efficient respiration 2 minutes of delivery or 30 seconds of clamping the cord.

Analgesia was judged as adequate if visceral sensations experienced without pain.

Other drugs: total number of doses given in whole series.
C = tinct. opii min. 15 and chloral hydrate gr. 30;
P = pethidine 100 mg.;
H = heroin gr. 1/6 or morphine gr. 1/4, with or wit barbiturate.

While the nitrous-oxide/air and trichlorethylene series are comparable as regards complications of labo the trichlorethylene series contains a larger numbe multiparæ than does the nitrous-oxide/air series. T slight balance in favour of trichlorethylene does vitiate the clear-cut difference between the two se as regards effectiveness of analgesia.

Analgesia was estimated in all cases by observati during labour, by questioning within half an hour delivery of the baby and again within twenty-four ho of delivery. (It soon became apparent that questioni only some hours after delivery would give a wrong favourable impression of the analgesia, in that memo of the unpleasant side tends to be dulled very quick though there may be clear recollection of events such moving from room to room and other incidents.) Reli of pain was more effective in the trichlorethylene ser and it was obtained with the use of fewer other drug The series quoted here is too small to justify the conclusi that 0·5% trichlorethylene/air used as routine wou provide adequate analgesia in 90% of all cases.

EXPERIENCE WITH TRICHLORETHYLENE

Trichlorethylene is a potent analgesic agent but the are limitations to its usefulness in labour. These are interest at the present time when attention is being give to the question whether trichlorethylene is suitab for the domiciliary midwife working without medic supervision.

The effect of inhaled trichlorethylene vapour i cumulative, so that if it is inhaled over a long period o time the patient becomes increasingly drowsy. This drowsiness is related to slow elimination of the drug. Using 0·5% trichlorethylene/air mixture, in average labour, drowsiness does not become marked until it has been used for about six hours. This applies when the vapour is inhaled only during contractions. When trichlorethylene is used in this way for longer than six hours, the patient usually becomes drowsy and her coöperation is impaired. When administration is likely to exceed six hours, or where supervision is not close gh to prevent inhalation between contractions. a concentration (0·3–0·4% in air) has been found able. This lower concentration is quite adequate ven in conjunction with pethidine or morphine. when the mother is drowsy there does not appear any falling-off in uterine activity such as to render tive delivery or post-partum hæmorrhage likely count of the trichlorethylene.

ere is a smaller tendency to emotional upset with lorethylene than with the nitrous-oxide/oxygen are, though pain relief is about the same with each. was well shown in the preliminary period of finding cost suitable strength for the mixtures. When the us-oxide/oxygen mixture was too strong many nts became excited by the stimulus of uterine actions and had to be restrained, whereas, when the lorethylene/air mixture was too strong the patient e increasingly drowsy without preliminary excite-. This is in keeping with the greater analgesic r of trichlorethylene compared with nitrous oxide, h reduces the patient almost to the state known in thetic parlance as that of "uninhibited reaction" re comparable pain relief is obtained. For the same n. trichlorethylene is more useful for episiotomy. ive to twenty breaths of 0·5% trichlorethylene/air allow episiotomy to be performed without pain and minor reaction to the physical sensation of cutting, reas with nitrous-oxide/oxygen the reaction may be ssive.

xperience suggests that the 0·5% trichlorethylene/air ture is best suited to normal labour or to a fast-ing labour, where the administration is not expected ast more than six hours. This strength of tri-rethylene has proved helpful for the woman who is tionally tense with only a thin veneer of voluntary trol of her behaviour: here, nitrous oxide will produce obstreperous patient whereas trichlorethylene will w voluntary control to be maintained though pain is ved.

s regards toxic effects, maternal arrhythmia has been rved only once in more than 150 cases. In this case re was bradycardia, the pulse-rate falling from to 48 per minute while trichlorethylene was used, rising again as it was excreted. This patient was he acute stage of mumps at the time of her labour: appeared none the worse for her bradycardia and the hlorethylene was not withdrawn. The fœtal heart- in this case remained steady. Fœtal bradycardia been mentioned by one observer as likely to follow hlorethylene analgesia combined with pethidine yal College of Obstetricians and Gynæcologists 9), but this relationship has not been confirmed.

fœtal bradycardia appears to be a manifestation of gen-lack rather than drug depression. The relation ween inhalation analgesia and fœtal bradycardia has n studied and will form the subject of another article. clinical grounds there is little doubt that trichlor-ylene passes the human placental barrier and that rdosage of the mother often leads to a sleepy baby. initiation of respiration is, usually, delayed only en overdosage with trichlorethylene is combined with other analgesic drug which depresses respiration. this drug is pethidine, the dose should be much reduced half or quarter) from that required in conjunction th nitrous-oxide/air analgesia.

The chief conclusion reached from this investigation that trichlorethylene/air analgesia is at least as cient as other available methods and is particularly itable for certain cases. It is administered from paratus which is easily portable. These attributes trichlorethylene/air analgesia commend it as convenient d safe for domiciliary midwifery. It has also proved useful in a hospital unit handling normal and abnormal midwifery.

SUMMARY

The advantages and disadvantages of self-administered analgesia in labour are considered.

Trichlorethylene 0·5% in air is more effective than the usual nitrous-oxide/air mixture in relieving the pain of uterine contraction.

Nitrous-oxide/oxygen (75–25% mixture) is more effective than the usual nitrous-oxide/air mixture in relieving the pain of uterine contraction.

Trichlorethylene/air is better than nitrous-oxide/oxygen for a fast-moving labour and for the nervous patient, but is not suitable for prolonged administration.

I would like to acknowledge with thanks the facilities afforded by the Nuffield Department of Obstetrics and Gynæcology, and the Area Department of Obstetrics and Gynæcology, Oxford. The work was made considerably easier by the helpful coöperation of the labour-ward sisters and nursing staff of the two departments. I am also indebted to Mr. D. J. Finney, lecturer in design and analysis of scientific experiment, University of Oxford, for his valuable assistance.

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SYNTHETIC ŒSTROGENS IN MAMMARY CANCER

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RESULTS already published (Haddow et al. 1944, Nathanson 1946) indicate that the administration of certain synthetic œstrogens to patients with advanced mammary cancer may have temporary beneficial results. In a small proportion of cases there is dramatic improvement, including actual regression of the primary tumour and secondaries; in others the effect is not so striking but some hold-up of the disease results; while in the remainder the disease pursues its course apparently unaffected by the treatment. In all where improvement occurs it is only temporary, and ultimately the disease again becomes active and progressive.

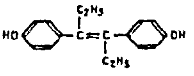
Various factors have been cited as contributing to the wide variation in response to treatment, but the reasons for it are still obscure. Their elucidation might well provide the *rationale* for more effective chemotherapy in this disease.

The mode of action of œstrogens on human mammary cancer is itself uncertain; it is not even clearly established that they act on such tumours by virtue of their œstrogenic activity per se. In the hope of obtaining further evidence on this point the clinical response in a series of patients under treatment with œstrogens has been compared on a quantitative basis with the concomitant changes in the vaginal epithelium—the keratinisation of the superficial cells of the vaginal mucosa being a well-recognised criterion of the response in animals and man to œstrogenic stimulation. Three œstrogenic compounds were used, two of these at more than one dose-level. The opportunity was taken to examine the influence of such factors as drug, dosage, and the age of the patient on clinical and vaginal responses.

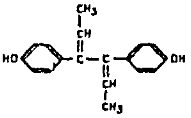
MATERIAL AND METHODS

Œstrogens Used

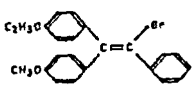
Stilbœstrol, dienœstrol, and 'M.2613' were used. Their formulæ are:



Stilbœstrol



Dienœstrol



M.2613

The two former were used at two dose-levels—high and low. The high dose was 20 mg. per day in four doses each of 5 mg. The low dose was 1·2 mg. per day divided similarly. M.2613 was given at doses of 300 or 600 mg. daily in three doses.

Separate analyses were made of the effects of stilbœstrol and dienœstrol at high and low doses. All cases treated with M.2613 were regarded as one group irrespective of the dose-level.

Clinical Material

In all, 50 patients with advanced carcinoma of the breast were studied. They were selected only in the sense of living close enough to the hospital for ease in follow-up, and of being postmenopausal to facilitate getting smears which would be uncomplicated with the cyclical menstrual changes in the vaginal mucosa. Most of them had had no previous treatment by surgery or X rays and were untreatable by either method when *first seen*. In 18 carcinoma had recurred after amputation, in 5 after X-ray therapy, and in 1 after both. In all the irradiated cases the disease had recurred, generally widely and it is therefore improbable that any response following chemotherapy was due to their previous X-ray treatment. Only 1 patient had had treatment with œstrogens; none had had androgens. The diagnosis was histologically proved in half the cases, but in none of them was there any doubt about the diagnosis, which was clinically evident from the metastases and the subsequent course of the disease.

Assessment of Clinical Status and Progress

Before treatment with œstrogens a detailed examination of the patients was made to ascertain the extent of the disease. Where the primary breast tumour was present its size was measured with callipers and the extent of ulceration was charted. Similar measurements were made of secondary nodules and lymph-nodes. Lung and bone lesions were followed with radiographs. The clinical assessment of the cases before and during œstrogen treatment was made on the measurements of as many of these manifestations as were present—i.e., the size of the primary tumour, the number, size, and extent of chest nodules, and the presence and size of enlarged nodes, and of pulmonary and bone metastases. *In 41 of the 50 patients two or more of these* manifestations were present.

The patients were mainly studied as outpatients. At each visit the amount of drug actually taken was checked as far as possible, a vaginal smear was taken, and the sizes of the lesions were noted. A numerical assessment of the progress of the disease was made at intervals of three months from the start of œstrogen treatment. A score of 0 was given if a manifestation was advancing, of 1 if it was stationary, and of 2 if it was regressing, as compared with its appearance at the start of treatment. The total score for each patient, divided by the number of manifestations exhibited, gave a mean value which in each case was multiplied by 6 to give a whole number, the mean clinical value (M.C.V.). Thus a patient showing regression of the primary lesion and of lung metastases but in whom secondary skin nodules were ad would be given a rating of $\frac{2+2+0}{3}\times 6=8$. The ance of a new lesion—e.g., in bone—was advancing.

TABLE I—REGRESSION-RATE ACCORDING TO SITE OF M FESTATIONS OF MAMMARY CANCER AFTER SIX TREATMENT WITH ŒSTROGENS

Site	Cases	Regressions
Primary	23	10
Lung	7	2
Bone	4	1
Lymph-node ..	26	5
Chest nodules ..	11	1

The Vaginal Smear

One or more preliminary vaginal smears wer before treatment began, and thereafter smea made at intervals usually of one month. The secretion was obtained from the posterior fornix glass pipette as suggested by Papanicolaou (193 from this a thin smear was made on a glass slid was *immediately placed in a* glass specime (3×1¹/₄ in. diam.) closed with a tightly fitting bung. In this way the drying of the smears was r and their staining properties preserved. As possible after being made, the smears were fixed ethanol and stained by a slight modification of the of Shorr (1940).

The cell types commonly found in human smears are described by Papanicolaou (1933) Papanicolaou and Shorr (1936). A quantitative tion of the response was made on the basis of the proportions of the various cell types which appe the smear. Numerical indices were assigned various stages in the transition from a typical menopausal smear showing no evidence of œst stimulation (index=0) to a "fully cornified" (index=9). The method was similar to that u Robson (1938) for the quantitative evaluation of re to œstrogens in the vagina of spayed mice.

RESULTS

Effects on Tumour

The response to the three œstrogens was A quantitative difference dependent on dose was for stilbœstrol and dienœstrol where two widely di

TABLE II—CASES TREATED WITH DIENŒSTROL

Case	Three months		Six months	
	M.S.I.	M.C.V.	M.S.I.	M.C.V.
	A. *Dose-level 1·2 mg. per day*			
1	4·5 (2)	0	4·6 (5)	—
2	6·0 (2)	3	—	—
3	5·7	0	5·8 (5)	—
4	5·7	12	6·1	12
5	3·8	0	—	—
6	7·3	3	7·0	3
7	5·0	0	4·2 (5)	0
8	4·3	12	4·8	12
9	6·0	0	—	—
10	5·8	6	5·9	6
	B. *Dose-level 20 mg. per day*			
11	4·2	3	4·8	0
12	6·7	6	6·7 (5)	—
13	6·5 (2)	12	—	—
14	1·5 (1)	3	2·0 (4)	0
15	5·3	3	4 6 (5)	0
16	4·8	0	—	—
17	3·5	6	3·3 (5)	6
18	6·7	12	5·8	6
19	4·7	9	1·6 (4)	9
20	3·8 (2)	3	—	—
21	6·3 (2)	3	—	0
22	7·2	8	6·2	8
23	2·8 (2)	0	—	—
24	6·7	1	5·9 (4)	1
25	5·8	3	—	—

levels were employed. Thus the M.C.V. at three hs for the group treated with high doses of stilbœstrol dienœstrol was 5·3, that for the low-dose group 3·4.

ne dependence on dose was shown in the ocurrence degree of vaginal hæmorrhage. This was more ent and severe in high-dose cases, the over-all inci- in the series being 58%. Nausea was complained only 3 cases, 2 of these being on low doses.

e age of the patient bore a relation to the clinical nse. Over the whole series the M.C.V. (three hs) for patients over sixty averaged 5·4, that for under sixty being 3·7. The corresponding values months were 5·1 and 3·0. This better response of patients was not due to more of them being treated higher doses, since these patients represented only of the high-dose group, and 55% of the low-dose). Nor was it due to the inclusion in the under- group of patients who were recently menopausal who might be considered to be less favourable ; the average M.C.V. at both three and six months e 7 patients who were recently menopausal was r than that of the remainder of the under-sixty p.

TABLE III—CASES TREATED WITH STILBŒSTROL

Three months		Six months		Months on drug
M.S.I.	M.C.V.	M.S.I.	M.C.V.	
A.	*Dose-level*	1·2 *mg. per day*		
6 3 (2)	3	6·3 (5)	—	5
2·0 (2)	0	—	—	2 –
7·3	12	7 0	12	8
1 5	2	1·5 (5)	0	8
6 5	0	6 0	—	5
3 8 (2)	4	—	—	5
5·3	1·5	4·9 (4)	—	3
1·5	3	1 8	—	2 +
B.	*Dose-level*	20 *mg. per day*		
3·2	3	2·9 (5)	2	4
1 0 (1)	6	2·9 (4)	6	6
5·8 (2)	12	—	8	21
5 7	6	—	—	16

Another possibility explored was that elderly ents might tend to have lesions which would be rated tationary, so increasing the M.C.V. This was not so. proportion of stationary lesions was the same in the age-groups, while on the other hand the proportion gressing lesions was significantly higher in the over- ies. Thus there is a real basis for the clinical ression that œstrogens are more effective in older ients.

has been thought that breast cancer in some sites respond to œstrogen treatment more favourably n it does in other sites. The regression-rate for the ious manifestations observed after six months' treat- nt is shown in table I. It will be seen that though re were differences in responsiveness they were not striking.

ore interesting was the observation that certain of patients who responded did so in respect of several nifestations. We therefore examined the possibility t in certain patients it was the disease as a whole t responded. The data show that this was the case ; our series the probability on a random basis that a tient would show more than one regressing lesion was ceedingly small ($p=0{\cdot}001$). This generalised type of ponse is one of the factors which must be remembered considering the growth-inhibiting action of œstrogens.

ffects on Vaginal Smear

In tables II, III, and IV the cases are grouped according the drug with which they were treated and the dose- vel employed. In most cases the mean of the first ree and of the first six consecutive monthly smear dices, starting one month from the commencement of treatment, are shown. These are designated M.S.I. (3 months) and M.S.I. (6 months) respectively. When less than the full numbers of consecutive monthly smear indices were available for calculation of the means the actual number used is indicated in parentheses. Together with these are shown figures for the clinical rating of the disease at three and six months respectively from the start of chemotherapy. These are designated M.C.V. (3 months) and M.C.V. (6 months) respectively. Some patients died or were lost sight of before the end of six months' œstrogen treatment ; this is indicated in the tables by a dash. The number of months during which drug treatment was continued in each case is also shown. Where the period was just under three months this is indicated by 2+. No differences were found between the three drugs in respect of œstrogenic effect and no correlation was found between the level of dosing and the response in the vaginal epithelium. The average M.S.I. of patients having the higher doses was almost identical with that of low-dose patients, for both three and six months of treatment. This suggests that the effect on the epithelium can be achieved with the smallest doses, and that where this effect is slight, despite the dose, other inhibitory factors must be operative.

TABLE IV—CASES TREATED WITH M.2613

Case	Three months		Six months		Months on drug
	M.S.I.	M.C.V.	M.S.I.	M.C.V.	
38	2·7	6	2·2	—	4
39	4·0	0	4·0	0	4
40	5·0	2	4·7	3	8
41	6 0 (2)	4	—	12	2 +
42	4·3 (2)	9	5·1 (4)	4·5	6
43	7·7	6	7·6	9	8
44	5·3 (2)	6	5·8 (4)	0	4
45	5·0 (2)	6	5·6 (4)	6	5
46	5·5 (2)	3	—	3	5
47	2·8 (2)	12	2·8 (5)	12	9
48	2·7	0	—	—	3
49	4·5	4	4·4	4	6
50*	5·3	0	4·5	0	7

* No drug for a year before M.2613. Had previously had urethane and before that stilbœstrol and triphenylchlorethylene.

However, a positive correlation exists between age and vaginal response. The average M.S.I. for patients over sixty was 5·18 for the first three, and 5·25 for the first six months of treatment, while the corresponding figures for younger patients were 4·51 and 4·38.

A correlation was sought between the response as shown by the vaginal smears and the clinical response of the tumour. In figs. 1, 2, and 3 mean smear indices of individual patients have been plotted against the corresponding values for clinical response, both on arbitrary scales. It is evident that there is a limited direct correlation between the two. The practical conclusion emerges that patients who show a high M.S.I. may or may not respond to the treatment, while those who fail to show a vaginal response (M.S.I. less than about 4) rarely display significant clinical improvement.

DISCUSSION

The mechanism of action of œstrogens in human mammary cancer is obscure. No satisfactory explanation in terms of the known actions of œstrogens on the normal mammary gland in man or animals has been advanced, and none appears possible yet. It is not even clear that œstrogens act on such tumours by virtue of their œstrogenic activity per se ; but there are several reasons for thinking that they do. For example, their therapeutic effects in cancer are limited to tumours associated with the reproductive system (prostate and breast). In other forms of malignant disease in which they have been tried they have little or no effect (Haddow et al. 1944). There is thus no evidence for regarding them as general inhibitors of tumour growth comparable with X rays.

In the present work we have found three synthetic œstrogens, each a distinct chemical entity, producing effects in mammary cancer which are indistinguishable qualitatively, or even quantitatively (when dose-levels are given in ratio to the effective œstrogenic dose). This is further evidence that the effects on the tumour are but a manifestation of œstrogenic activity. It would be of interest to know the effect of other œstrogens, including those which occur naturally; but as far as we know this has not been studied.

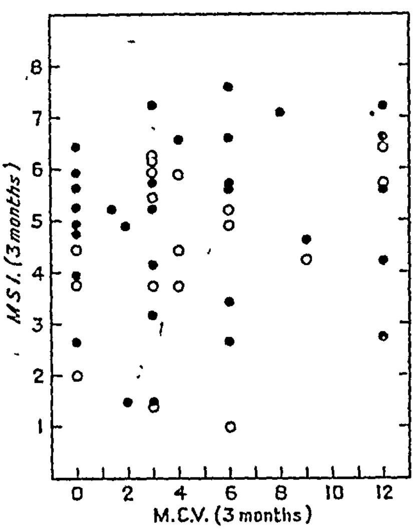


Fig. 1—Mean smear indices (3 months) plotted against mean clinical values (3 months) on arbitrary scales. Each point represents an individual patient. Solid points refer to patients for whom the full number of consecutive monthly smear indices was available for computing the mean, circles to those for whom a smaller number was available.

The fact most urgently requiring explanation is that some patients are quite refractory to œstrogen treatment, whereas in others the disease tends to regress in all its manifestations. Probably many factors contribute to the wide variation in response. The histological grading may be important, as suggested by Lowenhaupt and Steinbach (1949); this aspect of the problem has not been explored by us. We have found, in our patients, some measure of direct correlation between clinical response and vaginal response. This suggests that, where both are poor, some factor or group of factors is involved which tends to prevent both effects. In this connexion dosage and those other factors (absorption, distribution, metabolism, and excretion) which govern the access of the drugs to their site of action, must first be considered. Throughout the present investigation the œstrogens used have been given by mouth; clearly they must be absorbed and pass into the blood-stream in an active form before they can exert their effect on the tumour or the vaginal epithelium. It has been shown that those patients having stilbœstrol and dienœstrol at the higher dose-level showed more clinical improvement than the low-dose patients. Thus with regard to clinical effect such factors as are mentioned above are operative. We have no evidence that in our work the upper dose limits were reached, above which further increase would lead to no further improvement in response. therefore plan to administer these drugs in still doses, and also by the intramuscular route, in the of improving the therapeutic effect. We expect, over, that a limit will be set by an increase in incidence and severity of vaginal hæmorrhage.

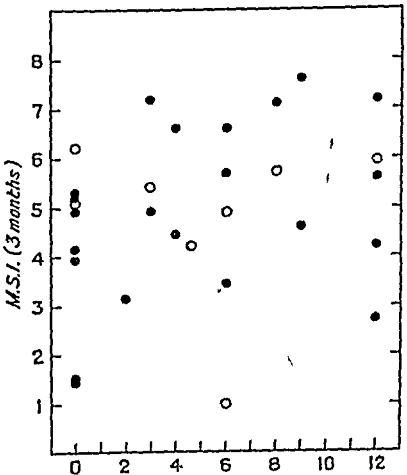


Fig. 2—Mean smear indices (3 months) plotted against mean clinical values (6 months). Conventions as in fig. 1.

The reaction of the vaginal epithelium, on the hand, is not correlated with dosage over the dose which we have employed. It appears that the full achieved with the smallest doses used, and that where effect is small, despite the dose, other inhibitory must be operative. We suggest that such correlation as exists between clinical and vaginal response is referable to such factors, and further, since both responses are correlated with the age of the patients, that those factors are associated with age. We hope to obtain a clearer indication of the existence of such factors from investigations at present in progress.

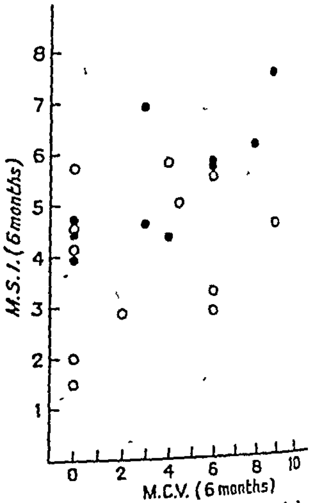


Fig. 3—Mean smear indices (6 months) against mean clinical values (6 m Conventions as in fig. 1.

A noteworthy feature of the results presented ab the almost complete absence of vaginal respon certain patients receiving high doses of œstrogen such patients we are now giving stilbœstrol b intravaginal route. As has been shown by Em (1941) stilbœstrol is a "true" œstrogen in the that it acts directly upon the vaginal mucosa wi having to undergo any preliminary metabolic cha the body. If, with intravaginal stilbœstrol, patients still fail to show any vaginal response we have clear evidence for the existence of inhibitory f quite unrelated to dosage, transport, and metab On the nature of these factors we can only spec It may be that in many of the patients treate vaginal and mammary tissues are inherently insen to œstrogens; it may be that the inhibition is d anti-hormones elaborated by the body, or perhaps malignant cells, which counteract their action. gesterone or androgens, in sufficient concentration, have this neutralising effect.

SUMMARY

The response of advanced mammary cancer to œst treatment has been studied in 50 postmenopausal w and compared on a quantitative basis with the and compared on a quantitative basis with the Concomitant changes in the vaginal epithelium. C improvement was greatest in the older patients a those receiving the higher doses of œstrogen. V keratinisation also was more pronounced in the patients but was not correlated with dosage.

The implications of these findings are discussed.

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ERIPHERAL SKIN TEMPERATURE IN NORMAL PREGNANCY

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1948, in the course of studies of peripheral blood- in women in the later weeks of pregnancy, it was nd that the skin temperature of the fingers was ntained at a level higher than that to be expected the environmental temperature (18–22°C); of 20 ients between twenty and forty weeks pregnant 1 had a resting finger temperature of under 30°C. imilar state of peripheral vasodilatation was found 17 of the 20 during the period one to eight weeks r delivery (Burt 1949).

ork on basal temperature changes during the men- al cycle and pregnancy has been published, but little ut circulation in the extremities at those times. ervations on the size and length of capillaries in gnancy have been reported (Hinselmann and Haupt 4, Melbard 1938), and in an investigation of peripheral od-flow during gestation and the puerperium Abramson al. (1943) found that in most women the blood-flow ained within normal limits in the leg and forearm ing the last two trimesters, but that in the hand re was a tendency towards an increase, which persisted some time after delivery. Their observations were ade at a room temperature of 25°C, the water in e plethysmograph being at 32°C.

ABLE I—SKIN TEMPERATURE OF FINGERS IN PREGNANCY

Subjects	Temperature			No. of readings
	Under 25 C	25–29 C	30°C or more	
pregnant controls	24	3	3	30
nant women :				
–12 weeks ..	29	1	4	34
13–28 weeks ..	32	17	35	84
–40 weeks ..	3	1	42	46
erperium 1–2 weeks	0	0	13	13

Particularly in summer, a subjective feeling of warmth ring pregnancy is reported by many patients. In 62 Raynaud recorded that one of his patients invariably agnosed her own pregnancy by her freedom from sospastic attacks, and there is a clinical impression at remissions from vasospastic attacks, chilblains, d acrocyanosis often occur during pregnancy.

I thought that it might be of interest to compare the sting digital temperatures in upper and lower limbs non-pregnant women with those at all stages of rmal pregnancy, at a low environmental temperature.

METHOD

Readings were made of the resting skin temperature the nail bases of all digits of one hand, and digits ne, three, and five of one foot, on 30 non-pregnant olunteers and on 100 patients during either normal regnancy or the puerperium. A thermocouple with a oveable applicator was used (Barcroft). Records ere made in the morning, after a light breakfast, and he room temperature was maintained at 17 ± 1°C. Each woman was rested quietly in bed for thirty minutes with one hand and one foot exposed, and thereafter igital skin temperature, pulse-rate, and blood-pressure were recorded at five-minute intervals for a further period of thirty minutes. In some cases records were obtained at several stages of pregnancy, and 16 patients were followed throughout pregnancy at intervals of about four weeks.

Observations were begun in September and continued until April; hence during the greater part of the time outdoor temperature tended to decrease. In addition, to obviate error from possible acclimatisation to winter conditions, during each month, except in the small group followed throughout pregnancy, readings were made at many stages of pregnancy.

RESULTS

Average Digital Temperature after Exposure to Room Temperature of 17°C for One Hour.—Average finger and toe temperatures at the end of the thirty-minute period were calculated in the non-pregnant controls. at four-weekly intervals during pregnancy, and during the first two weeks of the puerperium (fig. 1). In the controls average finger temperature was 22·3 ± 0·72°C (S.E. mean). During pregnancy it showed a gradual rise from 22·5 ± 1·02°C at five to eight weeks (a level nearly the same as that of the controls) to 34·2 ± 0 13°C during the last four weeks. All the patients examined during the last four weeks maintained full vasodilatation in the hands during the period of exposure. A small reduction to 33·3 ± 1·3°C was found in patients examined during the first two weeks of the puerperium. In the controls the average toe temperature was 19·9 ± 0·25°C (S.E. mean). During pregnancy it was 21·2 ± 1·1°C from the fifth to the eighth week, and did not show significant change until the twenty-fourth to twenty-eighth week, when it rose to 25·0°C. During the last four weeks the average toe temperature was 26·0 ± 1·2°C, and in the puerperium 23·0 ± 0·94°C. In fingers and

TABLE II—SKIN TEMPERATURE OF TOES IN PREGNANCY

Subjects	Temperature			No. of readings
	Under 25°C	25–29 C	30 C or more	
Non-pregnant controls	30	0	0	30
Pregnant women :				
0–12 weeks ..	30	4	0	34
13–28 weeks ..	73	6	5	84
29–40 weeks ..	23	11	11	45
Puerperium 1–2 weeks	10	2	1	13

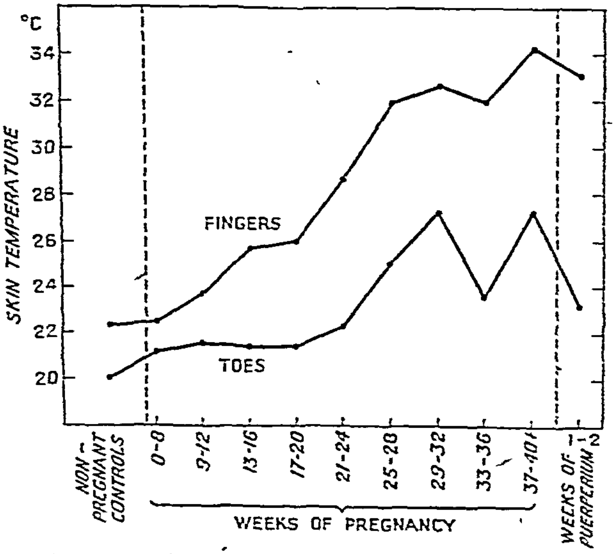


Fig. 1—Average digital temperatures of 100 pregnant or puerperal women after exposure to room temperature of 17 C for an hour.

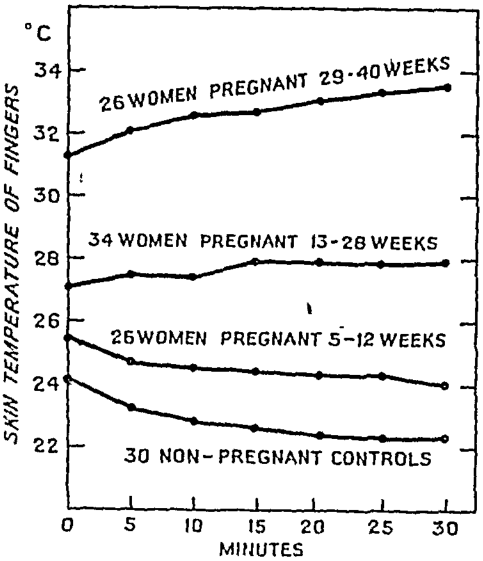


Fig. 2—Average finger temperatures at room temperature of 17°C.

toes there was a slight drop in temperature between thirty-three and thirty-six weeks.

Time of Change in Temperature.—There was a wide scatter in readings; some patients showed full vasodilatation early, others late; but, when the numbers were divided into groups according to temperature level, below 25°C, 25–29°C, and over 30°C (tables I and II) it appeared that the change in vasomotor control involved in this rise in temperature most often occurred in the middle trimester, and at the environmental temperature of 17°C it was much less marked in the feet than in the hands.

Effect of Excitement.—When the average readings during the whole thirty-minute period were considered (figs. 2 and 3), an interesting point emerged. The graph in the non-pregnant controls and that of women in the first trimester showed a slight but steady drop in temperature, whereas in the last trimester there was a slight rise. The change was more evident in fingers than in toes. Only first-visit readings were used for these graphs; therefore any initial vasoconstriction due to nervousness must have applied equally to each group. The slightly lower initial readings shown in the group in the last trimester may have been caused by vasoconstriction due to nervousness. It is unlikely that the controls and women in early pregnancy alone became increasingly nervous during the period of reading; it seems more likely that in them vasoconstriction increased because of the cool environmental temperature. It was noted that any disturbance or questioning caused a slight drop in finger temperature, even in patients whose fingers were becoming warmer (fig. 4), and because of this every effort was made to [illegible] interruption.

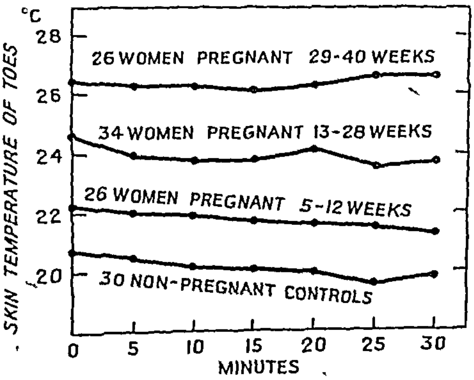


Fig. 3—Average toe temperatures at room temperature of 17°C.

Patients Followed throughout Pregnancy.—In 16 patients records were made at several stages of pregnancy. The finger and toe temperatures in this group closely followed those of the larger group. With slight individual variations, repeated recordings in the same woman produced a similar graph (fig. 5). In this group 4 patients were tested between one and seven weeks after delivery. In 3 of them the average resting finger temperature was 31·5–33·5°C. Normal lactation was established in 2 of these patients at the time of the test. The 3rd mother, whose digital temperatures were recorded seven weeks after delivery, had had to wean the baby three weeks after birth because of insufficient breast-milk, after which inhibition of lactation had been encouraged by taking large doses of Epsom salts. In the 4th patient resting finger temperature in the puerperium was 23·2°C and she complained of a subjective feeling of coldness. In her case vasoconstrictor drugs had not been used after delivery, and normal lactation had been established.

ANALYSIS OF RESULTS

Stage of Menstrual Cycle in Controls.—The day of the menstrual cycle was known in 27 of the non-pre[illegible] volunteers. The average resting temperatures of fingers and toes of 13 women in the first half of the cycle were 23·1 ± 1·3°C (s.e. mean) and 20·0 ± 0·36°C (s.e. mean) respectively. In the second half of the cycle the average finger temperature of 14 women was 21·2 ± 0·76°C, and that of the toes 19·5 ± 0·21°C. The differences are not statistically significant.

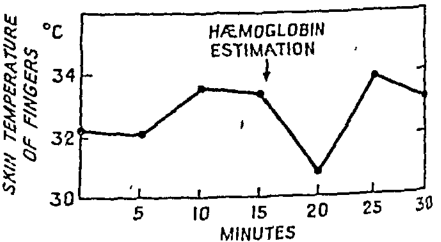


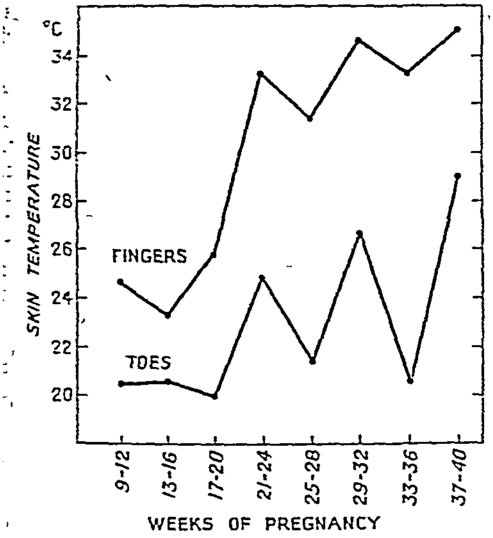
Fig. 4—Example of fall in finger temperature when patient is disturbed.

Effect of General Environment.—Since some of the women were inpatients living in a centrally heated building, whereas others were outpatients, it was thought advisable to see if there was any significant difference between the two groups. Those who were seen as outpatients in the later months of pregnancy had slightly lower resting finger and toe temperatures than had the inpatients, but the difference was not significant (tables III and IV.)

Age.—The average age in the non-pregnant controls was 24·9 years, whereas in the pregnant women it was 27·9 in those tested in the first trimester, 26·0 in the second, and 27·7 in the third. No significant difference was found when each group was divided into those aged 25 or less and those aged 26 or more (tables III and IV).

Parity.—No significant difference in finger or toe temperature was found in parous patients when compared with nulliparous patients in the controls or between parous and primigravid patients in the same trimesters of pregnancy (tables III and IV).

Normal Vasomotor State.—All patients were questioned directly regarding (*a*) tendency to have cold hands and/or feet in cold weather, (*b*) incidence of chilblains, (*c*) incidence of vasospastic attacks, and (*d*) subjective temperature changes during pregnancy. 10 non-pregnant women and 56 of the 100 pregnant patients stated that they



. 5—Digital temperatures in a woman throughout pregnancy.

lly had cold extremities in winter, while 9 non-nant women and 34 pregnant ones gave a history hilblains on hands or feet. 12 of the non-pregnant nen and 25 of the pregnant had occasionally noted spastic attacks in one or more fingers. There was ignificant difference in resting finger or toe tempera- between patients with a history of vasospastic cks and those without (tables III and IV).

major degree of vasomotor upset was present in one woman, who was seen in the middle trimester er second pregnancy. Unfortunately she came from stance and could not report again. She stated that re her first pregnancy she had had severe vasospastic cks in the hands. During her pregnancy and in the ter following delivery she had had no attacks, but hands had become very blue. When seen on a cold ter day at the seventeenth week of her second nancy her hands were blue and the resting tempera- was 21·1°C in fingers and 20·7°C in toes, readings h were lower than those of the average at this od. 4 other patients reported freedom from minor spastic attacks during pregnancy; 2 seen in the r months reported continuance of attacks; and ated that they felt subjectively colder as pregnancy anced, but they showed a resting finger temperature ver 30°C when tested during the last trimester. the 100 patients, the number who had noted a subjective feeling of warmth in the present or previous pregnancies was surprisingly small (19), but of the 16 followed throughout pregnancy, who were questioned repeatedly, 13 finally reported a subjective feeling of warmth or stated that they had not noted the cold during the winter. In this group the time of appreciating the change varied from the twenty-first to the thirty-eighth week of pregnancy.

TABLE III—AVERAGE FINGER TEMPERATURE IN °C *

ubjects	Non-pregnant controls	Weeks of normal pregnancy		
		5–12	13–28	29–40
tient ..	21·3 ± 0·9 (10)	23·8 ± 1·1 (8)	29·6 ± 1 4 (13)	33·5 ± 0·6 (18)
atient ..	22·6 ± 0·85 (20)	23·9 ± 0·95 (18)	26·7 ± 1·1 (19)	32·6 ± 0·58 (19)
1 25 or less	22·3 ± 0·65 (23)	24·8 ± 1·3 (14)	27·7 ± 1·2 (19)	33·6 ± 0·66 (11)
1 26 or more	22·6 ± 0·22 (6)	24·4 ± 0·75 (11)	27·4 ± 1·3 (13)	33·3 ± 0·73 (14)
tiparous ..	20·3 ± 1·1 (6)	25·4 ± 1 6 (8)	27·94 ± 1·3 (12)	34·2 ± 0·21 (9)
liparous ..	23·5 ± 0·8 (24)	23·4 ± 0 6 (18)	27·95 ± 1·2 (21)	32·8 ± 0·7 (16)
-pasm esent ..	20·2 ± 0·3 (12)	25·1 ± 1·8 (7)	26·7 ± 1·3 (13)	32·2 ± 1·0 (5)
ospasm bsent ..	23·7 ± 1·0 (18)	23·5 ± 0 74 (19)	28·6 ± 1·2 (21)	33·6 ± 0 53 (20)

ean values for finger temperature in non-pregnant and pregnant women. The figure following the mean is the S.E. of the mean, and the figure in parentheses is the number of observations on which the mean is based.

PULSE-RATE AND BLOOD-PRESSURE

In the present investigation the average pulse-rate and blood-pressure readings showed a slight drop during the thirty-minute period in non-pregnant and pregnant patients.

At the end of the thirty-minute period the average pulse-rate was 71 in the non-pregnant controls, whereas in the pregnant women it was 75 in the first trimester, 77 in the second, and 83 in the third. In the 13 patients tested during the first two weeks of the puerperium the average pulse-rate was 82.

The final average resting blood-pressure was 109/70 in the non-pregnant controls, 109/66 in the first trimester, 107/64 in the second, 114/78 in the third, and 113/78 in the puerperium.

SUMMARY

At a room temperature of 17 ± 1°C observations were recorded of the resting skin temperature of 30 non-pregnant women, 87 pregnant women, and 13 women in the first two weeks of the puerperium.

In non-pregnant women and during the early weeks of pregnancy the resting toe temperature closely approached that of the environment, whereas the temperature of the fingers was only a few degrees above it.

As pregnancy proceeded, in most of the women the extremities became warmer and did not cool in a moderately cold environment.

This maintenance of vasodilatation in cool surroundings was more marked in the fingers than in the toes.

A slight drop in resting temperature of fingers and toes occurred during the first two weeks of the puerperium, but it did not fall to the levels found in the non-pregnant controls or during the first trimester of pregnancy.

During the resting period there was a gradual drop in the temperature of the extremities in non-pregnant controls and patients in the early weeks of pregnancy, but in women in the later months of pregnancy the resting temperature tended to rise. It is suggested that

TABLE IV—AVERAGE TOE TEMPERATURE IN °C *

Subjects	Non-pregnant controls	Weeks of normal pregnancy		
		5–12	13–28	29–40
Inpatient ..	19·1 ± 0·26 (10)	21·7 ± 1·07 (8)	23·7 ± 0·97 (13)	26·3 ± 1·13 (18)
Outpatient ..	20·3 ± 0·33 (20)	21·2 ± 0·5 (18)	21·2 ± 0·47 (19)	24·4 ± 0·87 (19)
Aged 25 or less	19·9 ± 0·3 (23)	21·2 ± 0·65 (14)	21·8 ± 0·54 (19)	28·4 ± 1·39 (11)
Aged 26 or more	19·8 ± 0 64 (6)	21·6 ± 0·79 (11)	22·5 ± 0·97 (13)	24·7 ± 1·28 (14)
Multiparous ..	19·0 ± 0·37 (6)	20·5 ± 0·5 (8)	22·4 ± 1·06 (12)	26·3 ± 1·56 (9)
Nulliparous ..	20·1 ± 0·28 (24)	21·7 ± 0·66 (18)	21·9 ± 0·57 (21)	26·4 ± 1·2 (16)
Vasospasm present ..	19·9 ± 0·31 (12)	20·8 ± 0·46 (7)	22·1 ± 0·72 (13)	24·7 ± 2·55 (5)
Vasospasm absent ..	19 9 ± 0·81 (18)	21·5 ± 0·67 (19)	22·1 ± 0 63 (21)	26·7 ± 1·04 (20)

* Mean values for toe temperature in non-pregnant and pregnant women. The figure following the mean is the S.E. of the mean, and the figure in parentheses is the number of observations upon which the mean is based.

this rise may be due to the passing off of an initial slight vasoconstriction due to fear or excitement.

I am much indebted to Prof. Sir James Learmonth and Prof. R. J. Kellar for their help and advice during the course of this investigation, and to Prof. Henry Barcroft, whose specially designed thermocouple was used throughout.

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SERUM ACID PHOSPHATASE IN THE DIAGNOSIS OF CARCINOMA OF THE PROSTATE

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THE ability of the prostatic epithelial cell to secrete acid phosphatase has been repeatedly demonstrated (Gutman et al. 1940, Watkinson et al. 1944). Hyperplasia of the prostate gland is often reflected in greater acid-phosphatase activity in the serum, and many clinicians look on a raised serum-acid-phosphatase level as confirming the malignancy, and a low level the benign character, of such hyperplasia.

Though Abul-Fadl and King (1948) and King and Delory (1948) have shown that such a conclusion is not always justified, this test is still being used in the diagnosis of prostatic carcinoma, together with a radiographic search for bone metastases.

THE PLACE OF MICROSCOPY

Microscopy of prostatic tissues, apart from material obtained from endoscopy or aspiration biopsy, should not be regarded as a means of diagnosis but rather as a means of ascertaining the degree of malignancy of excised tumours. Routine microscopy of prostatic adenomata must be extensive if it is to be reliable. To reveal small malignant foci serial sections of the whole of the excised material must be examined. Therefore aspiration biopsy and endoscopy are haphazard methods of obtaining material for histological examination; the specimen obtained is only a random sample of the growth. Adenomata of the prostate are almost always surrounded by a bed of hyperplastic tissue from which further adenomata may arise, or in which malignant foci may remain or develop after prostatectomy. Whereas recognition of the more undifferentiated variety of prostatic carcinoma is relatively easy, the well-patterned adenocarcinoma may present difficulties of interpretation even to the most experienced pathologist. Histological examination is therefore limited in its scope as a precise means of determining the diagnosis and prognosis of any one case of prostatic hypertrophy. Further, as most of the carcinomas of the prostate diagnosed by clinical and radiological means are beyond radical surgical treatment, the histological method often can be used only after necropsy. Its chief value is in the detection of unsuspected early malignancy after surgical removal of a clinically benign gland.

DIFFICULTIES IN DIAGNOSIS

There are three types of case in which the diagnosis is difficult.

(1) The first type is *prostatic carcinoma* unreco able clinically or radiologically, but unexpectedly f to be malignant on histological examination of enucleated specimen. If the serum-acid-phos test was reliable it would be a great help in the operative assessment and the planning of the op in such cases.

(2) In the second type of case neoplastic deposits bone have been discovered radiologically, but the clin evidence that they originated from the prostate inconclusive. The primary lesion may be elsewh and remain undetected, and the radiological app ances may be atypical. Here again the serum-a phosphatase test, if reliable, would be of great value.

(3) In the third type the prostate gland appears t clinically malignant by reason of its hardness, irregula and size; histological examination is not feasi *and radiological evidence of metastasis is not forthcom* In such a case the diagnosis would be clinched by serum-acid-phosphatase test, if reliable.

INVESTIGATION

For these reasons we have reviewed the case-rec of 48 patients admitted to hospital with prostatic hy plasia, and we have tried to assess the diagnostic prognostic importance of the serum-acid-phosph level.

Method.—About half the serum-acid-phosph determinations were done by the phenyl-phosp method of King and Armstrong (1934) and the remai

TABLE I—SERUM-ACID-PHOSPHATASE LEVELS IN PROST. HYPERPLASIA CONFIRMED HISTOLOGICALLY

Case no.	Preoperative serum-acid-phosphatase level (K.A. units per 100 ml.)	Histological report
1	(3·0)	Adenomatous hyperplasia
2	(2·7)	Adenoma with foci of cellular atyp
3	(1·5)	" " " " " "
4	3·2	Adenomatous hyperplasia
5	(1·3)	" "
6	0·3	" "
7	(0·4)	" "
8	1·0	" "
9	0·3	" "
10	(0·8)	" "
11*	4·7	" "
12	0·4	" "
13	1·5	" "
14	(1·6)	" "
15	(5·0)	" "
16	(1·6)	" "
17	(4·2)	" "
18	(4·0)	" "
19	(2·7)	" "
20	(7·2) and (6·8)	" "
21	(1·7)	" "
22	(3·7) and (2·6)	" "
23	2 5 and 0·4	" "
24	(1·6)	" "
25	0·8 and 4·4	" "
26	0·3	" "
27	0·9	" "
28	1·2	Adenofibromatous gland
29	1·0	Adenomatous hyperplasia
30	3·4 and 1·2	" "
31	0·6	" "
32	1·8	" "
33	0·6	Adenomatous hyperplasia with at cellular proliferation
34†	(1·5)	Adenocarcinoma
35‡	1·5	Well differentiated adenocarcinoma
36	(1·8)	Small foci of adenocarcinoma
37§	4·1	" " " "

* In view of the high preoperative figure of 4·7 the patient was Several preoperative estimations than 1·8 K.A. units per 100 ml at 6·n

†

atase

‡

§ el 0·7 K.A. unit per 100 ml on charge from hospital a month after operation. *On stilbœ* Reported after 8 months, when serum-acid-phosphatase was 8·2 K.A. units per 100 ml. Had not taken stilbœstr 4 months. No radiol

TABLE II—SERUM-ACID-PHOSPHATASE LEVELS IN PROSTATIC HYPERPLASIA NOT CONFIRMED HISTOLOGICALLY

	Serum-acid-phosphatase level		Radiological changes	Remarks
	(K.A. units per 100 ml.)	Date		
	7·0 0·8 1·8 1·8 1·8	July 14, 1948 Aug. 19, 1948* Oct. 14, 1948* Jan. 10, 1949* March 9, 1919*	No evidence of metastasis	Clinically a hard craggy gland, not very large, treated with stilbœstrol 5 mg. daily since diagnosis, health maintained
	1·5 1 2	March 19, 1948 March 11, 1949*	Calcareous deposits in the prostate, no evidence of metastasis	Hard nodules felt in both lobes of prostate, treated with stilbœstrol since diagnosis
	(0 6)	Oct. 31, 1947	No record	Clinically a hard left lobe of prostate patient died of uræmia Nov. 6, 1947, no necropsy obtained
	1·8	May 21, 1947	No bone changes	Clinically a hard lobe of prostate; regarded as carcinoma and treated with stilbœstrol; letter recently received from relation stating patient too weak to attend for follow-up.
	1·6 0·4	Oct. 1, 1948* Feb. 4, 1949*	X-rays showed no bone changes on Feb. 7, 1946, and Feb. 9, 1949	Treated with stilbœstrol for last 3 years as a carcinoma because of hard prostate; in good health
	12·0 6·8	June 21, 1948 July 9, 1948*	No bone changes	Treated with heavy doses of stilbœstrol and dienœstrol; died, jaundiced at death, no necropsy specimen
	3·1	Jan. 19, 1949	pelvis, sion of	Clinically a carcinoma, suprapubic cystotomy, died in auricular fibrillation, no necropsy
	5·7 0·6 2·3	July 22, 1948 Aug. 6, 1948* April 21, 1949*	Secondary deposits in lumbar spine and pelvis	Only a small adenomatous nodule removed at cystotomy, histologically a benign glandular hypertrophy, treated with stilbœstrol
	103 31·9 14·4 15·0	Sept. 6, 1948 Sept. 18, 1948* Oct. 7, 1948* April 30, 1949*	Secondary deposits in lumbar spine and pelvis	Small piece of gland removed showed no evidence of malignancy, treated with stilbœstrol
7	(2 1) (0·8) (1·6) 7·1 0·4	Oct. 13, 1947 Oct. 17, 1947 Feb. 20, 1948 July 1, 1948 Aug. 18, 1948*	Secondary deposits in lumbar spine and pelvis, July, 1948; in July, 1946, X rays showed no evidence of metastatic disease	Histological report 1946 adenoma, 21 months after original operation and after two subsequent explorations for bladder neck obstruction, patient returned with secondary deposits and raised serum-acid-phosphatase level. Remarkable clinical improvement with stilbœstrol
8	4·0 1·0 3·5	March 19, 1949 March 29, 1949 April 19, 1919*	Secondary deposits in spine and pelvis	Clinically left lobe of prostate irregular

* Readings obtained after administration of stilbœstrol.

the formalin-inhibition method of Abul-Fadl and ng (1948). Figures in parentheses in the accompanying les are those obtained with the former method.

Results.—The preoperative serum-acid-phosphatase els, together with the histological findings in 33 cases benign prostatic hypertrophy are set out in table I well as those of 4 cases of histologically confirmed cinoma. It is to be noted that in 3 of these 4 cases adenocarcinoma the serum-acid-phosphatase levels re conspicuously low, and in the 4th the level was ly 4·1 King-Armstrong (K.A.) units per 100 ml.

Table II sets out the details of 11 cases diagnosed and ated on clinical grounds as carcinoma of the prostate which no histological proof was obtained. The gnosis rested mainly on clinical examination of the ostate aided by the estimation of the serum-acid-osphatase level and routine radiography of the lumbar ine and pelvis.

Excluding cases 39 and 42, in which the diagnosis nnot be considered definite, there remain 13 cases carcinoma of the prostate in which serum-acid-osphatase levels were known before treatment with lbœstrol was begun; they were 0·6–103 K.A. units r 100 ml.

DISCUSSION

In this series of cases the serum-acid-phosphatase vel before operation seems to have been of little value differentiating between clinically benign enlargements the prostate and those in which small areas of alignancy were unexpectedly found on microscopy.

In 36 of the cases shown in table I the preoperative iagnosis had been benign adenomatous hyperplasia; of these were found to be of early malignant change. Case 35 had been regarded clinically as malignant The serum-acid-phosphatase level in these 4 malignant cases was 1·5–4·1 K.A. units per 100 ml., and in the whole group 0·3–7·2 units per 100 ml. Of the 42 estimations made in the 37 cases in this group 40 were less than 5 K.A. units per 100 ml. The 2 higher levels were found in the same patient (case 20). The most frequent reading was in the range 0·3–3·0 K.A. units in which there were 31. Low or normal serum-acid-phosphatase levels cannot therefore be taken as evidence of the essentially benign character of a prostatic hyperplasia.

Wray (1945) states that serum-acid-phosphatase levels up to 3·5 K.A. units per 100 ml. are normal; those of 3·5–5·0 K.A. units are significant if there are clinical reasons for suspecting prostatic carcinoma; and those above 5·0 K.A. units strongly suggest prostatic carcinoma. Abul-Fadl and King (1948) maintain that serum-acid-phosphatase levels above 5 K.A. units strongly suggest prostatic carcinoma, and those above 3 K.A. units are suspect, especially after formaldehyde treatment of the serum. These levels have been used for grading prostatic neoplasms preoperatively according to their degree of malignancy. If cases of prostatic tumour associated with a serum-acid-phosphatase level under 5 K.A. units per 100 ml. are regarded by clinicians as benign, errors in diagnosis will inevitably arise.

In the series investigated by Abul-Fadl and King (1948) 8 out of 22 patients with prostatic cancer with bone metastasis had a serum-acid-phosphatase level under 5 K.A. units per 100 ml., and 19 out of 22 patients with prostatic carcinoma without bone metastasis had a level under 5 K.A. units, whereas 6 out of 23 patients with adenomatous hyperplasia of the prostate had a level of 5–21 K.A. units. In view of this wide range it is obviously necessary to exercise great caution in using the serum-acid-phosphatase level for diagnosing prostatic disease. This need for caution is reinforced by the fact that Boylan and Tillisch (1948) found that in 44 out of 100 cases of carcinoma of the prostate with skeletal metastasis the serum-acid-phosphatase level was within normal limits.

Sullivan et al. (1942) suggested that a normal serum-acid-phosphatase level associated with carcinoma of the prostate was due to the anaplastic character of the neoplasm; but in cases 34–37 in the present series the histological pattern was that of a well-formed adenocarcinoma.

In the 12 cases in which prostatic carcinoma had been diagnosed on clinical findings the serum-acid phosphatase level was 0·6–103 K.A. units per 100 ml., but despite this greatly increased range levels higher than 10 K.A. units were found only in 2 patients. In the remaining 10 cases the level was 0·6–7·1 K.A. units which is almost identical with that of the cases regarded preoperatively as benign. In this group 4 cases also showed radiological evidence of vertebral or pelvic metastasis, and in these the level was 3·1–103 K.A. units per 100 ml. In the remaining 8 cases without bone metastasis the level was 0·3–12 K.A. units.

It was in the cases included in table II that the diagnosis was most difficult, because there was usually no indication for radical surgery allowing thorough histological examination of the removed tumour. Radiological evidence of metastasis gives no certain indication of the site of the primary tumour in many instances. According to Willis (1948) the error attached to clinical diagnosis of prostatic hyperplasia is as high as 2 out of 7 cases, based on his series of 31 patients, upon whom very thorough necropsies were done.

In the present series there are 15 cases of carcinoma of the prostate, in 4 of which the diagnosis was confirmed histologically, and in only 2 of which the serum-acid-phosphatase level was higher than that obtained in 33 cases of histological benign hyperplasia—a frequency too small to be of definite help in the individual case.

Wray (1945) and other workers have suggested serial determinations of the serum-acid-phosphatase level as a means of controlling the treatment of prostatic cancer with synthetic œstrogens. This might be feasible where the initial level is high; but, where the initial levels are low, small reductions are insignificant, probably not outside the range of experimental error.

SUMMARY

The preoperative serum-acid-phosphatase levels were investigated in 33 cases of benign prostatic hypertrophy, 4 cases of adenocarcinoma of the prostate, and 11 cases clinically diagnosed as cancer of the prostate with or without metastases in bone.

Prostatic malignant disease was often associated with a normal serum-acid-phosphatase level, and the test was of little value in the clinical assessment of most cases.

A low serum-acid-phosphatase level cannot be accepted as evidence of the benign character of a prostatic tumour.

We are very grateful to Mr. Philip Hawe, F.R.C.S., and to Mr. W. R. Hunter, F.R.C.S., for allowing access to the records of patients under their care.

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ACUTE POLYARTERITIS NODOSA IN CHILDHOOD

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POLYARTERITIS nodosa, though recognised more than formerly, remains a rare disease. With the ledge that its classical features, such as the subcuta nodules and eosinophilia, are often missing, there been a tendency to diagnose it on insufficient gro The experimental evidence for its allergic origin is unconfirmed, and it may be premature to draw p between polyarteritis nodosa and such conditions anaphylactoid purpura, nephritis, and acute rheumati If all conditions where an allergic element is combi with inflammatory vascular lesions are to be classed varieties of polyarteritis nodosa, then this term will ce to have any clinical value, and the classification of will not be advanced. Nevertheless there seems no doubt that polyarteritis nodosa is sometimes unrecognised cause of grave illness.

In the following case the peripheral vascular predominated in the early stage. The clinical p bore close resemblances to conditions described other names.

CASE-HISTORY

A girl aged 7 years was admitted to the Kent and S Hospital in the early afternoon of Aug. 10, 1948. She been quite well until two weeks previously, when she a sore throat and fever. This responded to sulphonam about five days. Two days before admission, she of aching legs. On the day of admission she co nausea on waking. During the morning she vomited times and it became apparent that her face was swelling. midday there was well-marked œdema of the cheeks orbital region. There was slight epistaxis, after which vomit was bloodstained. She had passed some clear on waking, but none since. There had been no melæna.

Previously she had had measles, whooping-cough, and chickenpox, but none severely. The rest of the family, including her two sisters, was quite well. Their diet included plenty of fresh fruit and vegetables.

On examination the child was drowsy but conscious. Bo eyelids were ecchymotic and swollen. The palpebral fissu were occluded and could not be opened even with pressu The cheeks and the upper lip were œdematous and shiny an did not pit on pressure. Blood oozed from the left palpe fissure and both nares. The pulse was slow and regular an the blood-pressure 118/60. There was nothing abnormal chest, heart, or abdomen. A blood-count showed: hæmoglobin 88%; red cells 4,380,000 per c.mm.; platelets 80,000 per c.mm.: white cells 32,000 per c.mm. (polymorphonuclears 86%). Ascorbic acid 500 mg. and vitamin K 10 mg were given intramuscularly.

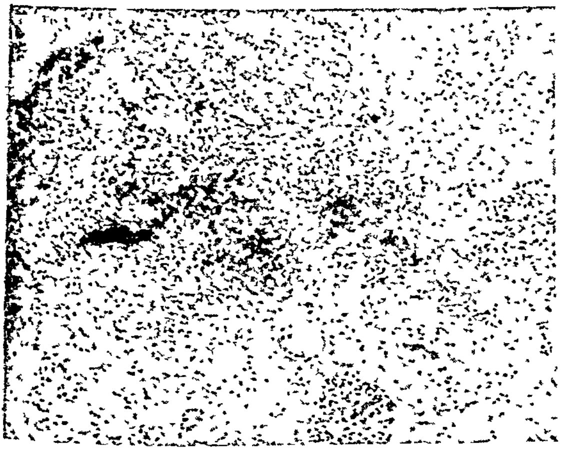
By 9 P.M. on the same day, the facial œdema had increased, and the bleeding continued. The blood-pressure was 138/80. One pint of stored blood was given by intravenous drip, and subsequently the infusion was continued with 5% dextro in 1/5 physiological saline. Penicillin was given intramuscularly, 150,000 units four-hourly. At midnight it was noticed that the feet had become blue, cold, and œdematous. The discoloured area involved the whole of the foot and ankle and had a sharply demarcated upper edge.

On the *second day* the facial œdema did not increase, but a blue staining appeared, which became progressively deeper in colour. The bleeding from the palpebral fissures and the nares continued slowly but steadily. There was occasional vomiting of bloodstained mucus.

Since admission, we had been anxious to examine the urine, but none was passed. There was no evidence of distension of the bladder, and it was recognised that the child had either partial or complete suppression of urine. A catheter was passed and 2 oz. of bloodstained urine was obtained. It contained red blood-cells, pus cells, and granular casts. At subsequent intervals a catheter was passed again, but, as no more urine was obtained, steps were taken to re-establish ion of urine. At this stage the blood-urea was 265 mg.)0 ml. and the intravenous infusion was therefore changed % dextrose. On several occasions 20 ml. of 50% dextrose given intravenously. But none of these measures was ssful.

the *third day* the face showed a "butterfly" area which lmost black. The hæmoglobin had fallen to 48% and a er pint of blood was given. At this time thrombocytes 100,000 per c.mm., and bleeding-time was over 12 tes; coagulation-time was normal.

the *fourth day* there was little change. The blood-urea 58 mg. per 100 ml. As the suppression of urine remained ute it was decided to use peritoneal dialysis, in the hope it would tide the child over until the kidneys recomed secretion. Under local anæsthesia, a small abdominal r and cannula was inserted into the peritoneal cavity, e left iliac fossa. About 750 ml. of 10% dextrose solution un in during about 20 min., using an ordinary infusion olitre' drip-chamber and rubber tubing which was ected to the cannula. The rubber tubing was then ped. After an hour the fluid was siphoned off. The urea nt of the fluid obtained varied between 0 25 and 0·44%. procedure was carried out twice daily and the amount fluid which siphoned back approximated to the amount in on each occasion.



1—Section of kidney showing acute necrosis of arteriole, with surrounding hæmorrhage. (× 85.)

)n the *fifth day* the blood-urea had fallen to 188 mg. per ml. and the feet were warmer and less blue.

)n the *sixth day* the child, who had been remarkably scious all the time, relapsed into coma. Her blood-urea now 376 mg. per 100 ml. After two fits she died.

Necropsy.—The orbits were filled with hard coagulated sses of blood, and attempts to remove a globe by dissection ved futile, because tissues could not be differentiated. The heart and lungs appeared normal. The peritoneal cavity wed only the entry marks of the cannula used for dialysis: re was no evidence of peritoneal infection. The spleen was larged to about three times the normal size and showed eral small infarcts. The kidneys were swollen and intensely morrhagic; the cut surface was much congested, with any hæmorrhages; the capsule stripped easily. The suprapal glands were not affected. The bladder was empty, and ere were no other abnormalities of the renal tract. Other scera appeared normal.

On removing the brain, it was found that the hæmorrhage d extended over the whole of the anterior fossa, but mained entirely extradural. The brain itself showed only me flattening of the convolutions, consistent with increased tracranial pressure. No evidence could be found of thrombi any large vessels.

Histology.—An acute arteritis involved arteries and arteriles extensively, with complete necrosis of the affected segnents of the vessels and much resulting hæmorrhage into urrounding tissues. The lesions were most widespread in the idneys, where the effect was one of almost complete infarction of both kidneys. The spleen was also widely affected. Figs. 1 and 2 show typical lesions. The picture was that of acute polyarteritis nodosa, and the lesions were identical with those frequently described in this condition.

DISCUSSION

This case presented difficulties in diagnosis. The main signs were those of multiple spontaneous hæmorrhages into the orbits and soft tissues surrounding the eyes, with epistaxis and hæmatemesis. There followed rapidly subcutaneous hæmorrhages over both feet and ankles, and an absolute anuria which ultimately proved fatal. The histological picture in tissues removed at necropsy was that of acute polyarteritis nodosa. Our purpose in recording the case is not only to draw attention to a dramatic variety of a disease whose clinical variations are endless, but also to suggest a common pathology for clinical conditions described under several different names.

Miller and Daley (1946), in their excellent review of polyarteritis nodosa, list some of the commoner skin manifestations of the disease, including erythema, urticaria, vesicles, bullæ, purpura, and ecchymoses, with such complications as necrosis, ulceration, and gangrene. They point to the origin of skin ecchymoses from rupture of subcutaneous aneurysms, and emphasise the increased incidence of purpuric skin eruptions and peripheral gangrene in childhood. Melczer and Venkei (1946), in a comprehensive review of the skin manifestations of polyarteritis nodosa, give a good account of the histology of the condition and describe new cases of multiple, often symmetrical, ecchymoses, followed by gangrene. They lay stress on the diagnostic importance of a prolonged bleeding-time associated with a normal platelet-count. Vining (1938) describes a case of proven polyarteritis nodosa in childhood where subcutaneous nodules complicated by gangrene occurred on the nose and shoulders, and where recovery followed a long illness. Sheldon (1947) describes under the name of purpura necrotica a syndrome seen in three children where the main features were symmetrical ecchymotic lesions leading to necrosis and separation of the sloughs: the depth varied from necrosis of the superficial layers of the skin to lesions involving deep muscle layers with resultant severe scarring. All three patients recovered and no histological examination was possible. From the description of the cases, however, it seems highly probable that the condition was again polyarteritis nodosa. Sheldon compares his cases with one reported by Beinhauer (1929) who described in a child aged 2 years a fatal purpuric condition which progressed to gangrene affecting areas in both thighs, buttocks, the left elbow, and the right hand. The condition was termed "purpura hæmorrhagica gangrenosa," but the photomicrograph reproduced in the paper is strongly suggestive of polyarteritis nodosa. In this

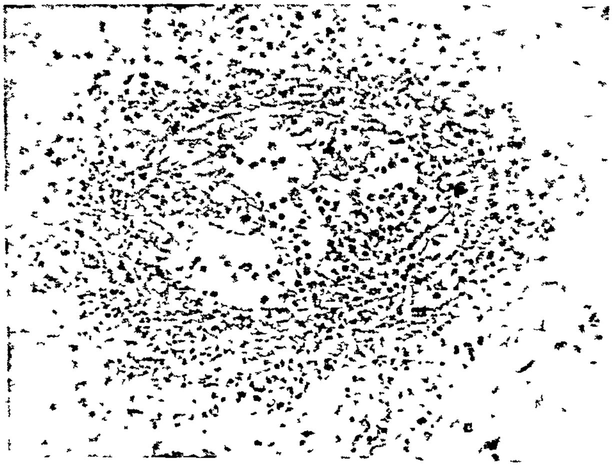


Fig. 2—Transverse section of arteriole in spleen showing acute necrosis. (× 295.)

case, as in Sheldon's, infection of the upper respiratory tract preceded the onset of purpura by 10–21 days.

Closely related to these cases are the rarely recorded cases of purpura and gangrene complicating scarlet fever. Hoyne and Smollar (1941) collected 17 recorded cases of gangrene following scarlet fever, and gave a description of a new one in a child aged 4, with symmetrical gangrene of both feet, developing in the third week of scarlet fever. Following amputation, section above the level of gangrene showed a severe arteritis apparently identical with polyarteritis nodosa.

In postscarlatinal gangrene massive purpuric and ecchymotic lesions are frequently described as preceding the onset of gangrene. The maximal incidence is in childhood. Here then appears a clear link with another rare condition—purpura fulminans. This severe form of purpura, originally described by Henoch, appears from time to time in the literature, usually as a severe complication of scarlet fever. Heinild (1947) in recording a fatal case in a child of 3 weeks emphasises the ætiological rôle of scarlet fever, the purpuric condition developing 2–4 weeks after the rash. He describes the violent bluish-black infiltrated ecchymoses, surrounded by a red halo, as specific of streptococcal sepsis. Henoch's strict diagnostic criteria of a violent ecchymotic eruption proceeding rapidly to a fatal conclusion and never associated with mucosal or internal hæmorrhages have had to be abandoned because an increasing number of cases have been reported, and it is now agreed that the condition is not always fatal, may be associated with hæmorrhages from mucous membranes or internal organs, and is sometimes followed by gangrene in the affected regions. It is clear that this condition can no longer be separated from postscarlatinal gangrene.

These descriptions have so much in common that they seem to refer to a single clinical entity, with minor variations. The patient is usually, but not always, a child, and the illness usually follows 10–21 days after an upper-respiratory infection—usually streptococcal and often scarlet fever. The main features are sudden extensive, commonly symmetrical, ecchymoses of the skin, often involving the extremities, and in the more severe cases followed by local gangrene. There may be associated hæmorrhages from mucous membranes or internal organs. There is little or no deficiency in blood-platelets, but a prolonged bleeding-time is sometimes found. The course is variable: in some cases it is short and fatal, but in others it is long and stormy, with relapses not uncommon. The histological findings, where reported, are those of an acute arteritis, the lesions being characteristic of polyarteritis nodosa. The condition must be regarded as an acute variety of this disease, in which the peripheral arteries and arterioles often bear the brunt of the attack.

Our case exemplifies most of these features but is unusual in that there was very severe involvement of the internal organs, especially kidneys and spleen. A similar complete anuria following almost complete infarction of both kidneys has been described by Rodnick and Davidsohn (1942) in an adult.

SUMMARY

A case of acute polyarteritis nodosa in childhood is described.

The relation between this condition, purpura fulminans, postscarlatinal purpura and gangrene, and purpura necrotica is discussed, and a common ætiology is postulated.

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CHOICE OF A TEST-MEAL

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TEST-MEALS offer the most direct method of gating simultaneously the emptying and the the stomach. In this laboratory the development new method of investigating gastric activity which the amounts emptying and amounts secreted to measured made the choice of a test-meal a problem of surprising difficulty. We wished to a standard meal which would minimise the between individual subjects in emptying and The factors which led to the final choice are below.

PHYSIOLOGICAL CONSIDERATIONS

It is customary to divide gastric secretion into th phases according to the origin of the secretory stimul the psychic or appetite juice flows first; then the of the gastric phase; and finally the juice of the phase.

The amount of appetite juice is believed to vary w the palatability of the meal. No matter what mea chosen, the psychic response to it will vary in differ subjects. To reduce this variation as far as possi the meal should engender neither profound pleasure distaste: it should have the bland quality of pota rather than the emotional atmosphere of oysters. S a choice provides a small stable psychic stimulus w relatively little influence on the total amount of gas juice secreted in response to the meal.

The gastric phase of stimulation is believed to h two components: (1) mechanical, the result of distens of the stomach by the meal; and (2) chemical, result of stimulating substances present in the meal.

In order to simplify interpretation, it is desirable eliminate one variable. In an investigation desig to measure gastric emptying it would be impracticabl reduce to a minimum the volume of the meal. It is theref necessary to minimise the chemical stimulus. This be achieved by ensuring that the meal contains substances known to cause gastric secretion as a res of their chemical qualities—e.g., protein derivativ Since the intestinal phase is also believed to result fr chemical stimulation, such a meal would be expect to have a minimal stimulating effect from the intes But an effective stimulus is desirable to secure measura volumes of secretion. To achieve this, the volume the meal must be as large as is compatible with a maxim response and the tolerance of the subjects. Thus large bland meal might be expected to owe its stimulat effect mainly to mechanical distension of the stoma and little to chemical and psychic stimulation.

PHYSICAL CONSIDERATIONS

These physiological considerations are a guide to t choice of a meal but there are other, more practic considerations. The test-meal must be recoverable a should allow quantitative estimation of the constitue of the gastric secretion. Unless the meal is fluid becomes liquefied in the stomach, it will not be recov able through a tube which the average subject w tolerate. If the aim is to recover large quantities of meal in a short time, its viscosity must be such as allow this without suction dangerous to the gast mucosa; and our investigation called for a meal of l viscosity, to ensure thorough mixing in the stomach. the other hand, the meal should be somewhat visco since watery fluids tend to leave the stomach re quickly without allowing enough time for the investigati

-tric function. Thus a balance must be struck m a fluid of high viscosity and a watery solution. choice of an agent to render the test-meal viscous icult. No protein matter can be used for this se since it would be digested by gastric juice and oducts of digestion would inactivate the proteolytic es; and thus estimation of the enzymic activity secretions entering the stomach would be prevented. ermore, any digestion of protein or other substances alter the osmotic pressure of the gastric contents. , if the osmotic pressure of the test-meal is to be s an experimental variable, any substance which en down in the stomach must be excluded. Thus , alginates, or gruel are unsuitable.

viscosity of the meal should be uniform and lucible; in order that other workers may use the meal the substance responsible for the viscosity l be widely available in pure form, and it must not re with the estimation of any dyestuff incorporated.

CITRUS PECTIN

far no substance has fully satisfied these criteria; trus pectin, which has been used in our investigation, een found satisfactory.

tin is not broken down by treatment with gastric for 24 hours; it does not reduce the proteolytic ty of gastric juice except by dilution; it does not b hydrogen or chloride ions; and from a single sample it has proved possible to make up solutions viscosity has not varied by more than ± 10%. viscosity has been measured in absolute units, so by trial and error a comparable solution could be in other laboratories. Pectin has not interfered the estimation of phenol-red incorporated in the

the other hand, pectin has its disadvantages. not possible to make up a homogeneous solution except a mechanical mixer. It is not a pure substance, samples being contaminated with glucose, citric a small amount of chloride, and possibly other ances. Its viscosity is influenced by temperature, viscosity at 37°C being about half that at 20°C. lly, a solution does not keep at room-temperature more than 24 hours, fungi and acid-producing bacilli ng it an admirable culture-medium. However, with ol-red such contamination is readily detected by ge in the colour of the dye.

ne of the subjects has been enthusiastic over the ability of the pectin solution even after the addition gar and flavouring; but, although its bland texture ther cloying, no-one has complained of its taste. ral subjects have commented on their intestinal being after the meal.

sides viscosity, probably a number of other factors e meal affect the response of the stomach. Certainly osmotic pressure is important in determining the of emptying and probably also the secretory response. e is a tonicity which gives a maximal rate of empty- From experiments made with gruel fractional meals this appears to be produced by sucrose when depression of freezing-point is about 0·2°C.[1] But is not a suitable depression of freezing-point for a meal which is to be used in investigating the influence smotic pressure on gastric activity; the stomach to the test-meal secretions which depress the zing-point of the gastric contents to 0·4–0·5°C. ng to individual variation in the volume of juice eted it would be impossible to standardise the city of the gastric contents with a meal having a ression of freezing-point of 0·2°C. In preliminary eriments it was found that the depression of freezing- t of the gastric contents towards the end of a gruel l tended towards 0·4°C. It was therefore desirable to strike a balance between a depression of 0·2°C, giving rapid emptying, and one of 0·4°C, with an osmotic pressure least influenced by added secretions.

It has also been shown that solutions with a high osmotic pressure inhibit gastric secretion. The depression of freezing-point of the pectin test-meal—0·3°C—is believed to be below the threshold of the receptors for this response.

The final pectin test-meal used in our investigation contains 20 g. of pectin, 35 g. of sucrose, 60–70 mg. of phenol-red, and sufficient caustic soda to raise the pH to 6·5 in a litre of distilled water. In practice this test-meal has proved very satisfactory.

SUMMARY

Physical and physiological factors in the choice of a test-meal are discussed.

Pectin has proved satisfactory for rendering the test-meal viscous.

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[1] Hunt, J. N., Spurrell, W. R. *J. Physiol* 1948, 107, 245.

Preliminary Communication

A POLYTHENE SUBSTITUTE FOR THE UPPER TWO-THIRDS OF THE SHAFT OF THE FEMUR

There are occasions when it may be desirable to use an internal prosthesis to replace bone. Plastic substitutes have already been used with some measure of success for the head and neck of the femur, the carpal lunate, and the mandible. This preliminary communication is concerned with the more ambitious substitution of a plastic model for the upper part of an abnormal femur; metallic substitutes have already been used.

A boy, 12 years old, was admitted to hospital with a long-standing chondromatous dysplasia of the femur and tibia on the same side; its exact nature is not immediately relevant. We and our colleagues agreed that the only satisfactory treatment was amputation through the hip-joint. But an artificial limb for such an amputation is at best a poor affair, and we welcomed the suggestion made by Mr. K. I. Nissen that an attempt

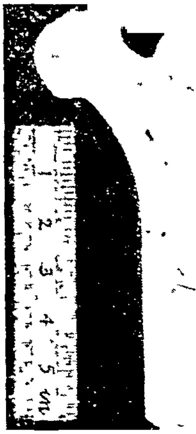
Fig. 1.

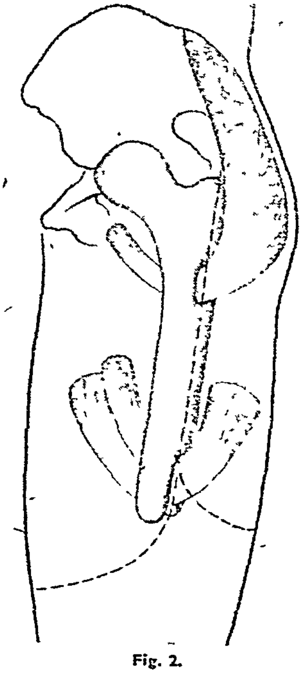
Fig. 2.

Fig. 1.—The polythene prosthesis.

Fig. 2.—Diagram of the prosthesis in position.

should be made to amputate the limb through the middle third of the thigh, fillet out the femur, and substitute for it a plastic model of its upper half or two-thirds. This was done. Precise measurements of the normal femur were first obtained from radiographs taken with precautions to avoid magnification and distortion.

'Polythene' was chosen as the material for the prosthesis on account of its satisfactory mechanical and chemical properties. Superficial alterations can readily be made at the time of operation, which is hardly possible with more rigid materials such as 'Vitallium' and 'Perspex.' Polythene is a straight-chain (aliphatic) hydrocarbon containing 1000–2000 carbon atoms and having only about one double bond; it therefore has the stability and high resistance to chemical change characteristic of the ordinary paraffins, and it also possesses considerable toughness and resistance to fatigue strain. It further resembles paraffin wax in that it has a non-wettable surface and that living tissue does not adhere to it. Polythene has already been used in the human body, animal experiments having demonstrated its inertness and lack of toxicity.

The prosthesis (fig. 1) was carved from a block measuring 10 by 4 by 3 in.; when finished it weighed $7^{1}/_{2}$ oz. and was 8 in. long. Channels were made in the prosthesis for the attachment of the flexors and extensors of the hip, the adductors, and vastus lateralis. From the nature of the deformity of the femur it was obvious that the abductors of the hip would be useless, so no provision was made for attaching them to the prosthesis.

The operation was performed on Aug. 2, 1949, by H. J. S. assisted by J. T. S., Mr. M. Albert, and Mr. D. Evans; the anæsthetic was given by Dr. M. V. H. Denton, and during the course of the operation two pints of blood were transfused. The steps (fig. 2) were as follows:

1. The external iliac artery was exposed and was then occluded by a loop of tape until the greater part of the operation was over.
2. The usual long anterior and short posterior curved incisions for amputation through the lower third of the thigh were made, their lateral junction being continued as a longitudinal incision up to the trochanter.
3. The lateral incision was deepened posterior to the vastus lateralis and the femur dissected out by peeling off the muscles with diathermy cutting. The flaps were completed and all vessels tied distally so that the vascularity of the flaps would be as great as possible.
4. The prosthesis was then inserted, after a good fit of the head of the "femur" had been obtained by filing its surface. The tendon of the iliopsoas was led through the canal in the upper part of the prosthesis and sutured to the tendon of gluteus maximus. The lower margin of the adductors was similarly attached to that of vastus lateralis, the point of attachment lying in the slot cut in the lower end of the prosthesis. By these means the prosthesis was secured effectively, and there seemed some prospect of its becoming well controlled by the more important muscle-groups.
5. The remaining muscles were brought together with interrupted sutures, and the skin likewise, around corrugated rubber drains inserted at the upper and lower ends of the longitudinal incision.

The operation, which lasted for two hours, was a formidable affair and during the last thirty minutes the patient's condition gave us some anxiety. However, with the aid of another pint of blood after operation, he improved rapidly.

Our chief anxiety was the avoidance of infection, for an enormous area of tissue was exposed during the course of the operation. Intramuscular injections of 40,000 units of penicillin four-hourly were therefore given from July 29 (four days before operation) until Aug. 26. Even so there was a little deep infection of the end of the stump and a terminal slough 2 by 1 in. in diameter. Pyogenic staphylococci were found in the discharge, as well as in the patient's nose during the third week after operation, and although these organ sensitive to penicillin it was decided to change to mycin (to which they were also sensitive) in view disturbing persistence of diffuse tenderness and Systemic streptomycin was therefore given at of 1 g. a day for one week. By Sept. 2 the healthy and the ulcer at its tip almost healed; usual after-treatment for an amputation thigh was started.

On Sept. 22 the state of the stump was normal boy has been measured for an artificial limb already walking on a temporary pylon.

We are greatly indebted to Imperial Chemical Ind Ltd. for supplying the block of polythene and de Havilland Aircraft Company for their help in mak radiographic measurements.

Royal National Orthopædic Hospital, London. H. J. SEDD D.M., F.R.C

Institute of Orthopædics, London. JOHN T. SC M.R.C.S

Medical Societies

ROYAL SOCIETY OF MEDICINE

Whither Antenatal Care?

AT a meeting of the section of obstetrics on O with Mr. LESLIE WILLIAMS, the president, in the a discussion on antenatal care was opened by Mr. BOURNE.

Mr. Bourne said he had been asked to keep the sion on a higher plane, so he deliberately avoided The recorded history of antenatal care went b Aristotle, but it was Pinard who laid the real found Pinard opened a home for abandoned pregnant in Paris in 1895 and noted an improvement in the whose mothers came under his care. Ballant Edinburgh had often been called "the father of ant care"; but this was inaccurate, for his main i was in stillbirth and fœtal abnormality. He was obstetrician, but rather a teratologist; he ha interest in antenatal health than in the deformed It was in later years that he instituted the syst antenatal visiting, and such a system had alread started some years before in Boston.

Mr. Bourne went on to recall how, in 1909, wh was a student at Queen Charlotte's, a small clinic was started by Harold Waller and others attention was focused first on presentation, secon the contracted pelvis, and thirdly on albuminuria an attempt was made to forestall dystocia. The 1914–18 checked progress; but in 1918 the Minis Health began to establish antenatal clinics, and were now over 1600 throughout the country. He d the history of antenatal care into four phases: (1 from Aristotle to Pinard; (2) that introduced by P (3) that introduced by Ballantyne; and (4) that ini at Queen Charlotte's Hospital.

Until lately the emphasis had been more on str than on function, except in regard to albuminuria. mechanical view encouraged unnecessary interf —for example, induction of labour where the hea high. Herman had even given a list of the peri gestation at which induction should be carrie according to the size of the conjugate. Inducti Krause's bougies was the usual method. Between and 1921 the induction-rate at Queen Charlotte' risen from over 2% to over 7%, and the maternal mor had steadily risen to 4·41 per 1000 in 1934, which w highest recorded since 1890. This was despite incr antenatal care and better obstetrical training. It appear therefore that up to this point antenatal car failed in its primary object. But much of this mor was due to mismanagement in labour. In the external pelvimetry came to be regarded as useless the mechanists got further encouragement from introduction of X-ray pelvimetry. Mr. Bourne dep the practice of basing obstetrical prognosis on radiological findings, and pointed out that the f normality were far too narrow ; moreover. many actors—notably the ability of the uterus to t—had to be taken into account.

function was all-important. could this be pre- r ensured ? Mr. Bourne felt that it could. Func- ction of the uterus depended primarily on the 's emotional reaction. and secondly on the type ent : and he contrasted the gynæcoid with her riods. her ready conception. her effortless preg- and her eutocia with—at the other extreme—the type with her menstrual difficulties. her unsatis- obstetrical history, and her liability in labour to num of pain with a minimum of effective function. gnancy unresolved fear was bound to lead to Physical constitution could not. of course. be ; but much could be done with regard to fear. hould if possible be exorcised during pregnancy. in secure good uterine function. Short of moderate rition, he did not think that diet had much effect ine function, except in the matter of premature The chief value of antenatal exercises depended gestion and the feeling engendered in the patient e was contributing towards her labour. The e results of X-ray pelvimetry and other structural d been overemphasised at the expense of function.

W. C. W. NIXON urged that the mechanistic ch should be replaced by the holistic. Dr. Wrigley inted out that meddlesome midwifery had spread he labour ward to the antenatal clinic. It was m who had coined the term "constructive e" in relation to pregnancy. and the new attitude natal care was born in those days. Professor Nixon ed the persistence in midwifery teaching of sis on the abnormal. A food advice bureau. such been established at University College Hospital. necessary part of an antenatal clinic. Nutritional a still prevailed. and all cases should have a routine tion of their hæmoglobin at their first attendance ain at 36 weeks. This would help to reduce post- hæmorrhage and its effects. X-ray examination chest was done as a routine at University College al. and this should be obligatory. He advocated l version as a matter of course. where needed— n anæsthetic only when an attempt without an etic had failed. One of his main concerns was the tion of fear. and classes of training organised by esthetist to the obstetric unit did much to engender nce. These courses were run in coöperation with iotherapist and a labour-ward sister. The physio- ist talked of the value of relaxation as indicated ntly Dick Reid. Breathing, posture. and exercises all influence labour favourably, and the exercises ere those of Mrs. Helen Herdman. These ideas iginated in Britain. but they were already better ted in the U.S.A.

A. J. WRIGLEY suggested that in the past the t's general health had too often been ignored : and lored the practice whereby one worker did all the esting, another rushed round with a sphygmo- neter, and another laid hands on the abdomen. t none took any notice of the patient as a person. to results from remedial exercises were discour- ; two investigations had shown that these exercises o significant effect on the nature or outcome of . As regards version, this was seldom necessary the 34th week ; no force should be used. parti- y if the patient was anæsthetised. Dr. Wrigley ed pointless and ineffective inductions for alleged aturity, and held that less attention should be to the breast in pregnancy. Without wishing to be d as a mechanist, he felt that all primigravidæ l have X-ray pelvimetry. In antenatal clinics routine practices could be replaced if more common were used. He referred to the present detachment antenatal officer from the hospital officer as a great hich had evolved fortuitously with the growth of atal clinics ; under the National Health Service etachment was being aggravated—not abolished as een hoped—owing to the division of responsibility en the local health authority and the regional tal board.

ARNOLD WALKER welcomed the provocative note Dr. Wrigley had introduced. He pleaded for less condemnation of the work of antenatal officers. Nobody thought this system perfect, but it was the only way to fill an otherwise inevitable gap. Welfare-mindedness was the spirit and essence of antenatal clinics. and it was backed by a knowledge of local conditions. These clinics should be integrated with the hospitals. though this would not be easy. In the clinics it was better to have routine than serious omissions.

Mr. A. W. PURDIE said that the system of antenatal clinics worked well ; but the system might break down through routine ; toxæmia might be missed because supervision automatically ceased when the patient outran her theoretical gestation period.

Mr. J. M. WYATT thought that much fear was engendered by the publicity given to the difficulties of labour and all the measures to which the patient was subjected to forestall these difficulties. The greatest source of reassurance was the successful multipara who had weathered six or more pregnancies without difficulty.

Reviews of Books

The Mammalian Adrenal Gland

GEOFFREY H. BOURNE, D.SC., D.PHIL., reader in histology in the University of London at the London Hospital Medical College. London : Oxford University Press. 1949. Pp. 239. 30s.

Dr. Bourne's book is a well-documented comparative study of the anatomical position and histology of the mammalian adrenal. It is introduced by a historical review of the gland and its histology. and contains descriptions of the adrenals of more than 250 species. Many of the descriptions of the adrenals of the eutherian mammals have been collected from published work. and so are less complete than those derived from Dr. Bourne's own observations (which are particularly extensive on the marsupials). His study demonstrates that the mammalian adrenal displays a remarkably constant structure, and he concludes that an adrenal gland in which the medulla is in the main completely separated from the cortex. and surrounded for at least three-quarters of its circumference by the latter. is as diagnostic of the mammalia as hair and nails. Only in the monotremes does the adrenal differ from the typical mammalian type. The book ends with a general summary of mammalian adrenals, including concise observations on the lipoids, pigments, and vitamin C of the adrenal. and the relation of adrenal cortical structure to function.

A Twentieth Century Physician

Being the Reminiscences of Sir ARTHUR HURST, D.M., F.R.C.P. London: Edward Arnold. 1949. Pp. 200. 15s.

WHEN Sir Arthur Hurst died he left behind him his autobiography in the making. Now, after four years. with the help of his friend Prof. John Ryle, it has been completed. If he had been given time Hurst would no doubt have expanded the account here given of his later activities to the scale on which his earlier life is presented. Had he done so the story might have gained in completeness but perhaps not in interest. For it is of the young. vital, ardent Hurst that we may be content to read. before his asthma had taken toll of his incomparable energy and vitality. Nothing that he ever did. or wrote. was dull or colourless. and here is the authentic voice of his early days, with its curious deep buzzing note of eager interest, determined to expose what he knew to be error and to demonstrate what he held—not always correctly or for very long—to be truth.

Autobiography is apt to unfold itself on a fixed pattern : childhood's memories. school. college. initial difficulties and setbacks, recognition and reward. Hurst's does not differ from others except that there were no initial difficulties, and no setbacks in the astonishing burst of success which was his from the first, and of which he here makes so little. For within a few years he became not only a consultant whose opinion was widely sought. but the most popular and inspiring teacher of his great medical school and an acknowledged leader in the investigation of disease by the newer methods. For a variety of reasons, at the turn of the century. medicine in this country was in some danger of stagnation, and Hurst was one of those who did much to restore the strong current.

As in all good autobiographies there is considerably less about the writer than about those with whom he came in contact. On almost every page are set inimitable little sketches of his teachers, colleagues, and fellow workers which one feels are true without being unkind—of Babinski for example, or Jacobson, Fripp, James Mackenzie, or Parkes Weber. His own rich and varied personality found expression in irregular features of extraordinary charm; so it is not strange that the two great artists whom he numbered among his friends lost no time in deciding that he must sit for them. Had it not been for Sir William Rothenstein's perfect sketch, Herkomer's fine portrait might seem altogether satisfying. Both show him as he was when young, and both are admirably reproduced in the present volume. All who knew Hurst and many who did not will enjoy the gay easy flow of his memories of a memorable life.

Coronary Artery Disease

F. P. Boas, M.D., associate physician, Mount Sinai Hospital, New York; N. F. Boas, M.D. Chicago: Year Book Publishers. London: H. K. Lewis. 1949. Pp. 399. 33s.

The subject of coronary disease is now so large that even a book of this size can cover only the essentials. It opens with brief accounts of the anatomy and physiology of the coronary arteries. Their physiology, indeed, is still little understood, and hence the mechanism of many cardiac pains cannot be explained. In discussing the drugs reputed to improve the coronary circulation, the authors can make out a good case for none but the quick-acting nitrites. Their account of the effects of coronary disease does little to clear up the confused terminology of our day. Thus "angina pectoris" is used for cardiac pain of effort, the term "coronary insufficiency" is condemned but retained, and "benign heart pain" is applied to pain which is not of cardiac origin. However, the descriptions of the clinical pictures are good and will help the practitioner in his essential problem—diagnosis.

Medical Clinics on Bone Diseases

A Text and Atlas. (2nd ed.) I. Snapper, M.D., clinical professor of medicine, Columbia University, New York. New York and London: Interscience Publishers. 1949. Pp. 308. £6.

The new edition of this work emphasises afresh the extent to which our knowledge and conception of diseases of the skeleton have changed in the last twenty-five years. Clinical investigation and clinical observation have repeatedly demonstrated that a close relation exists between general medicine and many diseases of the bones. Too often a monograph on skeletal diseases is a dull collection of weird cases published by an author who lacks the power of critical thought and who knows little of the rapid advance of medicine. By contrast, Professor Snapper's monograph has the refreshing air of a work undertaken by a master of modern medicine who has studied bone diseases according to a well-considered plan. His work ranges over a long experience in Amsterdam, Peiping, and New York, and shows the constant application of a lively intelligence, kept up at one time despite the worst cruelties of war. He delights in unfolding the complicated story of calcium and phosphorus metabolism and how it is related to hyperparathyroidism, osteomalacia, rickets, and the various types of osteoporosis. In doing this he shows equal skill in explaining histological and biochemical detail.

The whole book has been rewritten and rearranged. The chapter on hyperparathyroidism has been subdivided into four parts, and new ones on osteoporosis circumscripta cranii, leontiasis ossea, neurofibromatosis of the bones, and the skeletal lesions in lymphosarcoma, Hodgkin's disease, and hæmolytic anæmias have been added. Polyostotic fibrous dysplasia of the bones has been separated from lipoid granulomatosis of the bones, and the skeletal changes in leukæmia have been separated from multiple myeloma. There are 46 plates reproducing 264 illustrations, and 234 of these are true photographic prints.

For every condition ætiology, biochemistry, anatomy, histology, experimental data, sym radiological findings, diagnosis, and treatment fully considered. Statements made in the critically examined and each chapter has a full graphy. Those American doctors who are to think of morbid histology as an effete pastime can congratulate themselves that a ph *thoroughly trained in the European method* is their midst.

It seems curious that Professor Snapper has had no tunity to study the Fanconi syndrome, and it is to be that cases will be sent to him in New York in time for edition of his monograph. This form of osteomalacia is identified because of the associated renal it is evidently due to incompetence of the renal reabsorb glucose, amino-acids, and phosphates. gross deformities resulting from osteomalacia, fibrosis of liver may develop, and this sometimes leads to pri carcinoma of the liver. There is no other known con in which persistent amino-aciduria occurs; and al twelve different amino-acids have been identified in the of various patients—a partial revelation which could fascinate the agile mind of this author.

This monograph is a masterpiece. Most medical students will pass it by as too detailed for liking; postgraduate students will devour it; general practitioner will never find time to read it the orthopædic surgeon will say that he does not stand it. But for the physician it is a feast.

Modern Practice in Anæsthesia

Editor: Frankis T. Evans, M.B., F.F.A.R.C.S., anæsthetist, St. Bartholomew's Hospital, Lon London: Butterworth. 1949. Pp. 566. 50s.

Before even a line is read, both the eye and hand delighted with this book. It is a standard work reference, and must surely become indispensable *everybody interested in anæsthesia.* The scope frankly limited to clinical anæsthesia; so the resea worker in allied fields, seeking experimental statistical information, may be disappointed. For anæsthetist in training, however, or for the physic with an anæsthetic problem, the book is authoritati complete, and essentially practical. Dr. Frankis Ev has almost succeeded in the difficult task of maintain a uniform standard among his team of writers. A rat condensed and somewhat limited chapter on anato may well be the result of inadequate briefing, for author himself is not an anæsthetist: more topographi details of the nervous system are needed, as a guide regional anæsthesia, and this section deserved fuller better illustrations. A more serious falling off from general standard is to be found in the chapter apparatus: it is hardly enough to give a superfic description of the machines on the market today, and a book of such standing a more learned treatment needed of the mechanical, physiological, and phy principles underlying the construction of anæsth apparatus. For the rest there can be nothing praise. The authors are all experienced London an thetists, and, while their own views naturally rece prominence, they do give a fair review of other metho In the 38 chapters the whole field of clinical anæsth is covered, and that fact alone puts the book in a cl by itself.

Modern Treatment Yearbook 1949 (London: Medi *Press.* 1949. *Pp.* 338. 15*s.*).—This volume, edited by Cecil Wakeley, contains some fifty short articles on vari common conditions. They are divided about equally betwe medical and surgical subjects, and as in previous years written with an essentially practical outlook. The materi chosen is necessarily of varying importance, but the numero authors have obviously all approached their subject with th purpose of providing concise and helpful information, eve if much of it is not *particularly "modern."* This useful seri of low-priced handbooks would be even more useful, perhap if some way could be found of indexing the whole seri together, so that the practitioner could regard them as complete manual of treatment.

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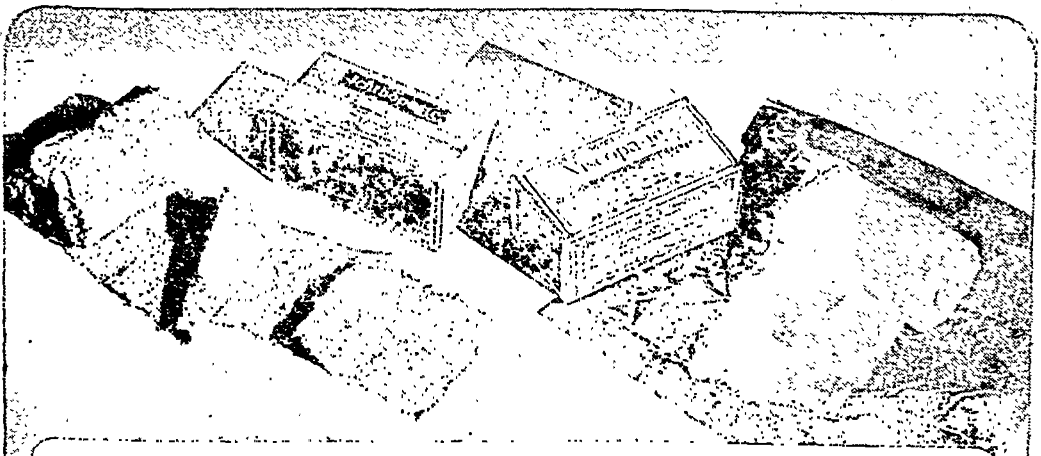

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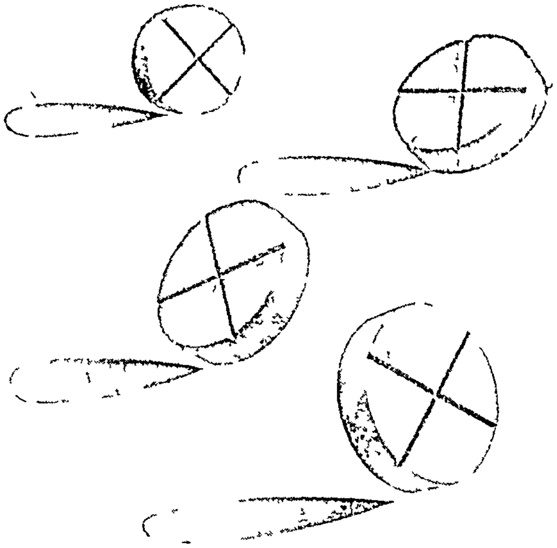

Three or four months may yet pass before the chil season is at its height. But *active* anticipation of the try weather can make the future a great deal brig for those inveterate chilblain cases. Started now, a routine of four Ostocalcium Tablets will make an es tial contribution towards the healthy capillary circul so vital in withstanding the cold. Ostocalcium e a controlling influence on the permeability of the ca ries, preventing the exudation of fluid into the tis that causes the characteristic swelling and inflamma And the Ostocalcium formula takes full account o need for vitamin D in calcium therapy, each tablet con ing 500 i.u. of the vitamin with 125 milligrams of calc

course of action
against chilblains . . . GLAXO OSTOCALCIUM TABLE

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GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3·

THE LANCET

LONDON: SATURDAY, OCT. 29, 1949

Economy

a the moment the Minister of Health has
ssfully defended the National Health Service
st arbitrary cuts that might have done it much
ge. But the pressure will continue—first on the
id that equally good value might be obtained
ess expenditure. and secondly on the ground
the country cannot at present afford a good
ce.

e there grounds for thinking that we are not
ng a pint out of the pint pot? If we are candid
nust surely admit that there are places where
eciable leaks may be suspected. For example, it
is a fair guess that a business consultant called
have a look at the rapid and expensive growth
he hospitals, and their high cost relative to the
ices of the general practitioner, would ask what
he relationship of the two, with reference to
hods of remuneration. On hearing that general
titioners are paid capitation fees but are at
rty to refer their patients to the hospitals for
nosis and treatment, he would observe that here
point which calls for inquiry. He might remark
if no change in the financial arrangements can
ontemplated, at least accurate information should
available as to what is happening, so that the
ess can be guided and controlled. Reference
atients to hospitals rose steeply after 1911, and
present financial arrangements are likely to
ourage the process to go further: and this shift
he centre of gravity towards the expensive hospital
specialist services is further stimulated by the
that it is to everyone's interest to press on
ards expansion. The consultants are naturally
for more sessions and for more registrars. Even
chief executive officer's remuneration is stepped
in accordance with the increasing number of beds
he group for which he is responsible. These and
ny other important arrangements have been settled
n the best of intentions—what is medically
rable, and what is fair as between employer and
loyed—but without any sufficient eye to their
ring on the growth of the hospital and specialist
ices. Exhortations from the Minister or from
regional boards, or even cuts in the estimates, are
r substitutes for incentives to economy, and are
ost wholly ineffective. The technical elements
so easily able to sway the layman, at almost any
el from hospital management committee to Parlia-
nt itself, that unless matters are arranged on a
tem of checks and balances within the system
re can be little hope of controlling the expansionist
dencies.

econdly, there is the larger question: "can the
ntry afford the present rate of expenditure on
dicine and the other social services?" We are being
rned by our American friends that the burden of taxation is throttling our industries and threatening our standard of living. We as a country have embarked on this programme, financed out of taxation, not because we think that it will pay in terms of productivity (though that may incidentally be so) but because we think it right to redistribute the national income in this way, and because it has become part of our conception of the social democratic State. It was accepted by the electorate in 1945 and is not now likely to be reversed whichever party wins the next election. But the revenue side of the budget is mainly sustained by the income-tax and various other forms of taxation, a large proportion of which is levied on industry: and if we have to rely on our industries to buy us our bread and meat and cotton from across the Atlantic we cannot pile any more burdens on to them. Therefore, runs the argument, expenditure on the social services, however desirable and right, must be checked. This line of thought is now dominant: it will be all that the Minister of Health can do to hold the present line, and further advances, on which many hopes had been set, must be eschewed for an indefinite future. Yet the fact remains that, strange to say, there are large sections of the population, by no means all of them with large incomes, who have money to spare for this and that, for anything from sweet rations and nylons to television sets and holidays abroad—not to speak of an expenditure on tobacco sufficient to provide the Exchequer with a revenue three times as great as the whole cost of the hospital services. Is it really true that a country which has money in its pockets for all these things cannot "afford" to bring its hospitals for the chronic sick up to date? Is it not perhaps rather the case that we have not yet found the right way of financing the social service, and that the mistake has lain in loading this expenditure on to the national budget while the latter remains largely dependent on taxation of industry for its resources? Ought not the cost of the social services to be considered, not in relation to the total national revenue as computed by the Chancellor of the Exchequer for his Budget, but against the far larger total national income? Should not means be devised for making the necessary cost of a healthy community as much a first charge on each man's earnings as is his expenditure on food and shelter?

It is easy to write "and means devised"; but they would of course imply a revolution in methods of taxation. It was perhaps of the ultimate necessity of some such change that Sir Stafford Cripps had a glimpse when he spoke of a special tax to finance the health service. Big changes in our fiscal system, not cuts in the social services, may be the right answer to our dilemma. It certainly seems worth reconsidering the possibility of redesigning the pattern of taxation so as to reduce the load of the social services on industry, and give expression to a truer scale of values, in which health and education come to the fore and cigarettes and television masts are pushed into the background. We can, one suspects, have a good health service if we want it badly enough. And if we tell the Americans that we prefer to have our health service—and to wear our togas till they are patched and patched again—what is that to them?

Too Much Vitamin A

NEARLY 25 years ago Japanese workers[1] noticed that the crude concentrates of vitamin A then obtainable were toxic when given experimentally in massive doses to animals. Later work, summarised by MOORE and WANG,[2] led to the recognition of skeletal fractures with intramuscular hæmorrhages as the characteristic lesions of an excessive intake of vitamin A in young rapidly growing rats, while older animals were often found to die suddenly from massive hæmorrhages in the viscera, without skeletal lesions. VEDDER and ROSENBERG[3] suggested that the lesions in rats resembled scurvy, while LIGHT and others[4] demonstrated that the syndrome involved a hypoprothrombinæmia, which could be corrected, without affecting the bone injuries,[5] by the administration of vitamin K.

The clinical observation of hypervitaminosis A, however, pre-dated its scientific discovery by several hundred years. Arctic explorers, at least since Elizabethan times, have recognised that the liver of the polar bear is poisonous, causing drowsiness, headache, vomiting, and peeling of the skin. The possibility that vitamin A might be the toxic agent was raised when RODAHL and MOORE[6] found that the liver usually contains about 20,000 I.U. per g., which means that the fresh tissues have nearly half the activity of good halibut-liver oil. The symptoms reported in explorers have not included the skeletal fractures or fatal hæmorrhages characteristic of experimental hypervitaminosis A, but their absence should not rule out vitamin A as the toxic factor in bear liver; the explorers presumably suffered from the acute effects of one large meal of liver, whereas the rats were given massive doses of vitamin A over long periods. RODAHL[7] has recently examined further specimens of liver from bears killed in north-east Greenland, and has found that the toxicity is associated with the vitamin-A fraction and not with the residual tissues after the extraction of the vitamin. The toxic fraction, moreover, becomes innocuous when its vitamin A is destroyed. He has also reported that the liver of an arctic fox, which the Eskimos believe to be poisonous, came close to bear's liver with 12,000 I.U. of vitamin A per g.; the edible livers of the snow hare and walrus contained much smaller amounts. In further investigations with vitamin A from other sources he has obtained more evidence of the resemblance between hypervitaminosis A and scurvy.[8] Thus both the clinical picture and the post-mortem findings in guineapigs given excess of vitamin A were very similar to those caused by a scorbutic diet, while in each condition the ascorbic-acid contents of the liver and blood-serum were much reduced. In a dog large doses of vitamin A for 57 days caused bleeding and swelling of the gums, with a reduction of the ascorbic-acid content of the blood from the original 0·7 mg. per 100 ml. to zero.

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Western Union and Health

A BASIC idea behind Western Union is "convergi progress." Article 2 of the Treaty of Brussels, sig in March, 1948, between the United Kingdom, Fran Belgium, the Netherlands, and Luxembourg—and force for fifty years—states that "The High C tracting Parties will make every effort in comm both by direct consultation and in specialised agenci to promote the attainment of a higher standard living by their peoples and to develop on cor sponding lines the social and other related servi of their countries." Pursuant to this article, t five Powers have set up, under a Council of Minist and a Permanent Commission, a series of exp committees, of which one is an expert committee health. This committee has now held four meetin at intervals of about six months, in London, Pa Brussels, and Luxembourg, and will meet next The Hague in March, 1950.

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[1] Takahashi, K., Nakamiya, Z., Kawakimi, K., Kitasato, T. *Sci. Pap. Inst. phys. chem. Res., Tokyo*, 1925, 3, 81.

[2] Moore, T., Wang, Y. L. *Biochem. J.* 1945, 39, 222.

[3] Vedder, E. B., Rosenberg, C. *J. Nutrit.* 1938, 16, 57.

[4] Light, R. F., Alscher, R. P., Frey, C. N. *Science*, 1944, 100, 225.

[5] Walker, S. E., Eylenburg, E., Moore, T. *Biochem. J.* 1947, 41, 575.

[6] Rodahl, K., Moore, T. *Ibid*, 1943, 37, 166.

[7] Rodahl, K. *Nature, Lond.* 1949, 164, 530.

[8] *Ibid*, p. 531.

[9] Toomey, J. A., Morissette, R. A. *Amer. J. Dis. Child.* 19 73, 473.

[10] Dickey, L. B., Bradley, E. J. *Stanford med. Bull.* 1948, p 315.

Perhaps the question on which the greatest practical lvance has so far been made is that of simplification health control at seaports and particularly airports. he principle has been adopted of treating the five untries as one country for this purpose, which eans the abolition of all health controls for aircraft d passengers making flights within the five countries save in exceptional circumstances—and instituting e health control only for aircraft and passengers riving from outside: this sounds comparatively mple, but has involved much detailed work. The ritish Ministry of Health have already anticipated is on a limited scale in the so-called "Paris experi- ent," whereby passengers from Paris no longer ave to fill up the personal declaration of origin and ealth; so its inquiries into where the previous fourteen ghts have been spent will no longer be a source of bald comment.

Finally, there is the intricate question of the lation of the "get together" activities of Western nion to those of the Council of Europe and of the orld Health Organisation. Clearly there are some alth questions now being considered by Western nion which are susceptible of treatment on a uropean or world-wide scale: but it seems that eliminary consideration and action by the Western nion powers has been advantageous, and that mparative strangers should not be admitted too nickly to family conferences. As in other health atters, political considerations may provide stimulus but should be the servants and not the asters of sound technical progress.

Operations for Mitral Stenosis

IN operating on the mitral valve to relieve stenosis, o considerations have to be borne in mind. The rst is that with extreme stenosis of the valve the ft ventricle is small; at necropsy the posterior rface—i.e., the wall of the left ventricular inflow act—appears short and the coronary vessels tortuous ven though unaffected by atheroma.[1] The second onsideration is that artificial mitral regurgitation is oorly tolerated by experimental animals with normal earts, and extensive cutting of the anterior valve arries a high mortality-rate.[2 3]

Both Harken and his team[2] and Bailey[3] have ased their work on these facts; by approaching through the left auricular appendage they aim at relieving the stenosis without causing extensive regurgitation. Harken, whose various methods have already been reviewed,[4] has attempted to mobilise the rigid cusps by dividing the commissures (valvuloplasty); and he has also removed a segment of the posterior leaflet. Bailey, on the other hand, has confined himself to "commissurotomy," in which he extends the cut into the normal tissue surrounding the fibrotic area of the valve, believing that the raised auricular pressure will keep the artificial opening patent. Of 10 patients operated on by him, 7 died. Among the causes of failure were cerebral embolism on the sixth day after operation: an error in technique by cutting across the valve leaflet; postoperative obliteration by fibrin deposits of a small, calcified mitral orifice which did not permit of adequate cutting; postoperative intrapleural hæmorrhage attributed to the unnecessary use of heparin and incorrect fluid administration; and severe hæmorrhage due to friability of the auricular wall (which he has often encountered in mitral stenosis). To these dangers may be added two recorded by Harken—namely, tachycardia and dislocation of the heart from its natural position. Thus the risk of operating on the mitral valve is still great, even in the hands of experienced cardiac surgeons familiar with the precautionary measures. These include permanent electrocardiographic control and the administration of procaine drips to combat tachycardia and myocardial irritability. (This precaution is now held to be more efficacious when the procaine is injected intramurally in a 2% solution.[5]) The latest development is that Murray,[6] of Toronto, has succeeded in animal experiments, and in two patients with mitral stenosis, in removing one mitral leaflet and replacing it by an artificial leaflet consisting of a section of cephalic vein turned inside out and strengthened with palmaris-longus tendon.

Of the indirect surgical procedures, which are designed to relieve pulmonary symptoms due to mitral stenosis, two have already been mentioned in these columns.[7] One of these, designed to produce an artificial interauricular shunt, was inspired by the observation that mitral stenosis associated with a natural defect of this nature (Lutembacher's syndrome) may run a mild course, and that serious symptoms, such as pulmonary œdema and hæmoptysis, are then rare. Harken and his team[4] hold that an artificial auricular septal defect is indicated only when the cardiac output is normal and increases on exertion, and when stenosis and regurgitation coexist; otherwise the fall in left-auricle pressure may cause insufficient blood to reach the left ventricle through the stenosed valve. Another objection to this procedure is that the artificial defect may become obliterated and that embolism may ensue: however, work is in progress in the U.S.A. with the purpose of ensuring that the defect is both large enough and permanent. The second method, which is less hazardous, consists in creating an extracardiac venous shunt between the right dorsal-segmental inferior pulmonary vein and the nearby azygos vein by non-

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Kirch, E. *Verh. dtsch. Ges. inn. Med.* 1929, 41, 324.
Harken, D. E., Ellis, L. B., Ware, P. F., Norman, L. R. *New Engl. J. Med.* 1948, 239, 801.
Bailey, C. P. *Dis. Chest*, 1949, 15, 377.

[4] Leading article, *Lancet*, 1949, i, 572.
[5] Smithy, H. G. *Dis. Chest*, 1949, 15, 385.
[6] Murray, G. *Ibid*, p. 394.
[7] Annotation, *Lancet*, 1949, i, 660.

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n America a similar dissatisfaction with traditional rapy has led to the search for new amœbicides. tely Anderson and others[1] have described the action two trivalent thioarsenite derivatives of carbarsone— dithiocarboxyl methyl derivative and the dithio-boxyl phenyl one. They claim that if the trivalent enic atom is masked by one of these thioarsenite ups its toxicity is diminished while its therapeutic ivity (as judged on infected rats and monkeys) nains unchanged. Chemical opinion in this country, vever, considers that these thioarsenite linkages are drolysed in solution and therefore will be loosened l more easily in the body; fundamentally the use these compounds is only a convenient way of giving valent carbarsone oxide, the active form to which inactive pentavalent carbarsone is converted in the dy. The Americans treated 82 patients with total ses of 3 0–4·2 g. by mouth in seven to ten days or 7·2 g. in ten to twenty-four days (either compound). ur months later, 74 of the patients were found to be ar of the amœbic infection, and the smaller dosage med to be as effective as the larger. Twelve of the tients vomited after the first one to three days' treatment; there were no other toxic reactions except reased bowel movement after the third to sixth day. ie two compounds were also found to be effective ainst infections with *Balantidium coli* (2 patients) it not against the other infections in which they were ied. On the face of it, these results seem promising. it since, from the chemical side, the new compounds not differ greatly from carbarsone inside the body, and ice carbarsone is generally recognised as being adequate as the main element of treatment, we should rhaps not draw any definite conclusions until several rther clinical reports have either confirmed or refuted is one.

A more interesting development concerns the new itibiotic, aureomycin. McVay and others[2] have ven this by mouth to 3 patients with amœbic dysentery divided doses of about 2 g. per day to a total of 19–22 g. he treatment caused the disappearance of *E. histolytica* om the stools and relieved symptoms, and the patients mained free from amœbæ and cysts for three weeks fterwards. No toxic effects were observed, apart from ausea for 48 hours in one patient. Here again it is too on to assess the value of the remedy, but the apparent sponse of this stubbornly resistant disease to an ntibiotic alone is a hopeful sign.

PARENTERAL PROTEIN IN INFANCY

SINCE their introduction ten years ago protein digests ave entered increasingly into the treatment of infants. Villiams and others[3] have lately published for the ledical Research Council's committee on the protein equirements of infants a report on 'Casydrol,' a British nzymic digest of casein. At the Children's Hospital, irmingham, they found that the intravenous infusion f casydrol is without danger, provided it is not given in reater concentration than 2·5%. They followed the tandard practice of always relieving any dehydration ith glucose and salt solutions and establishing a free low of urine before starting the maintenance infusion ontaining casydrol. They point out that since the odium in a continuous infusion of casydrol for a 10 lb. nfant may be equivalent to as much as 2 g. of sodium hloride per day, one must watch for signs of salt retention such as œdema; and they suggest that other reparations, such as the American 'Amigen,' which ontain about half as much salt as casydrol, are preferable because they can be more safely given in larger amounts than the conventional 1 g. per lb. body-weight per day which is the bare maintenance requirement of protein in infancy. They urge that casein hydrolysates should be given slowly, as by a drip, because of the risk of serious systemic reactions when they are given more rapidly, as by injection. Williams and her colleagues also indicate the desirability of improving nutrition by increasing the glucose content of parenteral solutions to 10%—a practice which is usually shunned because of the allegedly increased risk of venous thrombosis but which has been successfully adopted in America.[4 5]

Better results have been achieved with parenteral maintenance therapy in the last few years not only because of the introduction of protein digests but also because of the more accurate estimation of water and electrolyte requirements, the giving of optimal amounts of vitamins, and the routine prophylactic use of penicillin and sulphonamides. The Birmingham report concludes that the nutrition of very sick infants is benefited by the introduction of casydrol into their electrolyte-glucose intravenous solution, and that with such an addition infants will survive long periods of parenteral feeding.

NEW DEVICES AT THE LONDON

SOME antique practices in the handling of soiled linen persist in many of our hospitals. It is customary for nurses, before sending linen down to the laundry, to count and sort it in the ward, and to "sluice," or rinse out, badly soiled articles in the sluice-room—or even in the ward bathroom. The laundry-maids count the linen again, both before and after washing it, and the nurses count it once more when it gets back to the ward. The whole elaborate process is not only time-consuming but unhygienic and even at times dangerous. The London Hospital, a pioneer in the neglected art of leaving nurses free to nurse, has solved this problem. No linen-counting is done anywhere in the hospital. Each ward has its linen-trolleys—large tubular canvas sacks suspended open-mouthed on circular iron frames which run on castors. These frames are light, and can be easily wheeled to the bedside, where soiled bed-linen can be tucked uncounted into the sack. Filled sacks are taken from the frames, tied up, and dropped down a chute to the basement, where an electric trolley carries them to the laundry. They are sorted, washed, and returned uncounted to a central store; and from this store the ward sister indents daily for what she wants. Badly soiled linen is tied up separately and washed separately in the laundry. Thus linen sorting and counting, and the sluicing of soiled linen in the wards, as well as all the vexations of stocktaking day are avoided; and all the hospital linen is in constant circulation: no large stocks have to be kept in the wards, waiting to be used. A method of checking stock is necessary, of course. Every article is embroidered with the year of issue and a serial number; and when the sheets issued in a given year are to be checked, the sister at the central linen-store notes the numbers down as they pass through; over a period of three months an accurate report on the number circulating can always be made.

Various new measures have lately been taken at the London Hospital for the comfort of patients. Curtains on all-but-silent runners can now be drawn to form a cubicle round every bed; and while the nurses are glad to be spared screen-carrying, the patients rejoice in the added privacy. The only screens left are used to isolate patients who develop respiratory infections: they run on castors like the linen-trolleys and are covered in suture anastomosis with Blakemore's 'Vitallium' tube. Bland and Sweet,[8] the originators of this technique, have now reported their operative results in 5 patients, all of whom had frequent attacks of pulmonary œdema and hæmoptysis; in each of these patients pulmonary hypertension was associated with significant further rise of the pulmonary pressure on gentle exercise, and the left-auricle pressure was 400–500 ml. of water—i.e., 4–5 times the normal. Their hearts were not grossly enlarged. In 1 case, biopsy of the lung during operation revealed hæmosiderosis with thickening of the walls of the small arteries and the alveoli. Bland and Sweet believe that these cases belong to a group in which the patients eventually succumb not to cardiac but to pulmonary failure, though hypertrophy of the right ventricle usually develops: "They die before their time as far as their hearts are concerned." At operation, *as soon as the anastomoses were established* and the pulmonary clamp released, blood rushed with great force through the channel from the pulmonary into the azygos vein, and the pressure in the left auricle fell. Of the 5 patients, 4 did remarkably well; exercise tolerance improved and they remained free from pulmonary œdema and hæmoptysis for 12, 5, 4, and 2 months respectively. The 5th patient, a woman of twenty-five, died on the 11th day after operation. Before operation she had shown signs of active carditis, which was later confirmed at necropsy when a fresh antemortem clot was also found to have occluded the anastomosis; and Bland and Sweet point out that before operation smouldering carditis should be carefully sought. As to technique, they suggest that anastomosis without the intermediate vitallium tube may prove preferable. The sine-qua-non for this kind of escape-valve operation is a high pressure-gradient from the pulmonary to the systemic vein, as has been emphasised by Swan [9] who, apparently independent of Bland and Sweet, conceived the idea of the same kind of venous shunt, which he has performed in normal animals. Whether the shunt was accomplished by the tube method or by end-to-end suture, it remained patent only when a high pressure-gradient was introduced.

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[1] Anderson, H. H., Johnstone, H. G., Bostick, W., Chevarria, A. P., Packer, H. *J. Amer. med. Ass.* 1949, 140, 1251.

[2] McVay, L. V., Laird, R. L., Sprunt, D. H. *Science*, 1949, 109, 530.

[3] Williams, V. J., Bishop, E. A., Young, W. F. *Arch. Dis. Childh.* 1949, 24, 159.

[4] Butler, A. M., Talbot, N. B. *New Engl. J. Med.* 1944, 231, 585, 621.

[5] Dodd, K., Rapoport, S. *J. Pediat.* 1946, 29, 758.

If further trials prove that the artificial channel remains unoccluded, the indirect approach may well be preferred by the clinician, whose main concern is to relieve dyspnœa, recurrent pulmonary œdema, and hæmoptysis. Shunt operations that bring about a flow of blood from the left auricle or pulmonary vein to the right auricle or systemic vein must inevitably inflict an increased load on the right heart; but so far there is no evidence that failure of the right heart ensues, and in Lutembacher's syndrome such failure does not usually develop until a late stage. With its great capacity and established hypertrophy, the right heart—unlike the left ventricle—is prepared to deal with an increased volume of blood, provided of course that the cavity is not grossly dilated and the myocardium is not damaged. Under certain conditions of stress the increased activity of such a hypertrophied right ventricle may flood the lung, the outlet side being partly blocked at the mitral valve.[8] It is therefore surprising that so far apparently no "vent" operation to relieve pulmonary hypertension has been carried out; it might seem that such procedure, consisting perhaps in creating an artificial incompetence of the pulmonary valve, would be technically easier than the "shunt" procedure. Certainly direct mitral-valve surgery is still a formidable undertaking, fraught with great technical difficulties and dangers; and the cardiac surgeon will always have to remember that even after the most brilliant technical achievement on the mitral ostium, the ultimate result rests with the myocardium of the left ventricle, which has become accustomed to receive and eject a reduced amount of blood.

Annotations

CHARGE FOR PRESCRIPTIONS

It is a little ironical that, sixteen months after the introduction of free medical care, insured persons should now be asked to pay for their medicines—for the first time since 1911. Unfortunately, though old-age pensioners are to be excused the new charge of "up to a shilling" for each prescription, there are others to whom it may mean the re-erection of a barrier, if a small one, in the way of medical treatment, and the charge should perhaps be remitted in the longer illnesses—e.g., after four weeks' incapacity. The prospect of paying several shillings for medicine may keep some people away from the doctor, but at least it is better that they should pay for drugs and dressings than for mere access to the surgery. Practical difficulties may arise over the collection of payment by rural doctors who do their own dispensing and sometimes send the medicine to the patient by the local bus; and the Prime Minister did not say whether hospital dispensaries will make a charge—as they presumably should if patients are not to seek repeat medicines in outpatients.

To those who are anxious to see the National Health Service create better conditions of practice it has been galling to watch it fostering rather than restraining the bottle-of-medicine habit. The rise in the average annual pharmaceutical cost per person at risk from 4s. 9d. under National Health Insurance to just under 8s. last February [1] was partly due to higher dispensing fees, but also partly to a larger number of prescriptions per person: in Middlesex, for example, this rose from 1·93 in the last six months of 1947 to 2·47 in the last six months of 1948.[2] As everyone knows, a great many of these prescriptions have been for household remedies for which the doctor should never have been bothered at all, and there is reason to think that this abuse, so far from diminishing has lately grown. In so far as the new arrangement helps to "reduce excessive, and in some cases unnecessary, resort to doctors and chemists" it will be welcomed by the profession.

TREATMENT OF AMŒBIASIS

In Britain during the later years of the war a good deal of dissatisfaction was expressed over the results of treating chronic amœbic dysentery with any of the standard remedies. Most of the authorities favoured emetine bismuth iodide by mouth, reinforced with arsenicals (e.g., carbarsone), bismuth, or quinoline compounds (chiniofon, diodoquin) according to taste. Some of the failures were probably due to the type of cases treated—soldiers with many previous relapses and secondary bacterial invasion in the large intestine. These were often much benefited by courses of penicillin and succinyl sulphathiazole which suppressed the bacteria and cleared the way for emetine to work on the amœbæ.

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9. Bland, E. F., Sweet, R. H. *J. Amer. med. Ass.* 1949, 140, 1259.
8. Swan, H. *Amer. Heart J.* 1949, 38, 367.

1. Seventh Report from the Select Committee on Estimates. Session 1948–49. H.M. Stationery Office. 1949. Pp. 54.
2. *Pharm. J.* Sept. 10, p. 191.

subjective sensation, would work out in practice. tient suffering from shock or full of first-aid morphine ld probably be an unreliable witness on the finer cts of pain sensation. It might, however, be argued information on burn depth would not be required the patient had become fit for an operation (if was indicated), by which time he would be fit to erate in skin-sensitivity tests. The method (and rs) clearly merits an extensive clinical test, and Birmingham Accident Hospital will no doubt ide one.

PSYCHIATRIST LOOKS AT TUBERCULOSIS

. Wittkower[1] has spent $2^{1}/_{2}$ years in the psychoal study of tuberculous patients—a project undern under the auspices of the National Association for Prevention of Tuberculosis. By interviewing 785 nts, drawn from all social and economic grades and all age-groups, in sanatoria (good, bad, and ferent), at dispensaries, in their homes, at their s of work, and in village settlements, he has cond to review a very fair cross-section of the tuberculous munity. Each patient was interviewed for at least hours, during which time he was skilfully drawn out veal—not only to the psychiatrist, but very often s own startled self—his reactions towards his illness all its implications, his previous personality, and his situation before the onset of his disease.

ere are only three chapters. In the first Wittkower ribes the behaviour of tired and toxic patients re they go sick, how they may respond at the ent of diagnosis, and how they may react thenceard towards their illness. At first reading this ars to consist of little but spotlit glimpses of the ous; but when, in the second chapter these familiar ties of reaction are correlated with their determining hological factors they are revealed in a very different Wittkower admits that he had expected to unter a somatopsychic rather than a psychosomatic lem; but as his work progressed his interest shifted the rather obvious effects of suffering from tubercuon the patient's psychology to the more subtle ts of the patient's psychology on the incidence and se of his disease. In his last (and most thoughtoking) chapter he explores the possible connexion een a person's mental make-up and his predision to tuberculosis. The premorbid personalities d in 300 patients so investigated fall roughly into main groups: overtly insecure types (39%), llious types (12%), self-drivers (29%), and conflictssed types (13%). These are so graphically and quially described as to be easily recognisable; but identification with standard personality types, as ribed by Kretschmer, Jung, and other workers, is emely difficult. The reader, moreover, may well "Does the whole of humanity fall within these categories? (And if so, which am I?) And if not, would Dr. Wittkower describe those remaining s who apparently are immune from tuberculosis?" e finds that the outstanding common feature the premorbid personality is an inordinate need rt or concealed) for affection, coupled with cons over dependence. Again it may be asked, what extent is this maladjustment the lot of anity? Is it as rare (4 per 1000 population) as monary tuberculosis? Or is it so common that the xistence of tuberculosis might be accidental?" It ld be quite impossible to submit comparable groups normal healthy individuals to a similar inquisition ut their private lives; "normal" controls are therefore out of the question. But it would have been interesting to compare and contrast these findings in the tuberculous with those in patients suffering from other chronic diseases. There is no indication that the premorbid condition Wittkower describes is specific for the tuberculous. It may indeed be the common denominator of all illness; and, given this premorbid condition and a breakdown in psychological defences, a man might fall ill with whatever disease was handiest: one for which the stage was already set by heredity, lack of resistance, and infective organisms.

The statement that the prevalent mood among the tuberculous is that of anxiety and depression will come as a shock to many. Logically, of course, the situation created by a disease of unknown duration and uncertain prognosis should produce both anxiety and depression; but much the same situation confronted troops going into battle and Londoners facing a blitz, and conceivably their mood might have proved on psychiatric examination to be the same; but they did not show it. In terms of acceptance and rejection, the vast majority of Wittkower's patients appear to be rejecting the situation. Of the 24% who showed slight concern, only a small proportion "resigned themselves to the inevitable"; and "resignation" surely suggests a passive packing-up rather than an active acceptance? He admits that his book is incomplete: pressure of time did not allow full analysis of much of his voluminous data. We leave the patients, so to speak, still incapacitated by their disease and still uncertain of its outcome, and we wonder what happens to the psychology of those millions who arrest their disease and return to more or less normal life, and of those who, five or more years later, have almost forgotten they had ever been in a sanatorium. What has the tubercle bacillus done for them?

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[1] Psychiatrist Looks at Tuberculosis. By ERIC WITTKOWER, M.D., psychiatrist to the skin department, Saint Bartholomew's Hospital, London. London: National Association for the Prevention of Tuberculosis. 1949. Pp. 143. 12s. 6d.

COMMITTEE ON PRESCRIBING

THE Central and Scottish Health Services Councils, constituted under the National Health Service Acts, have jointly appointed a committee "to consider and report from time to time whether it is desirable and practicable to restrict or to discourage the prescribing by practitioners giving general medical services under the National Health Service Acts of 1946 and 1947 of (i) drugs and medicines of doubtful value or of unethical character; (ii) unnecessarily expensive brands of standard drugs." The members are:

Miss Janet Aitken, F.R.C.P.; Prof. Stanley Alstead, F.R.C.P.; Dr. J. A. Brown; Sir Henry Cohen, F.R.C.P.; Prof. E. C. Dodds, F.R.C.P., F.R.S.; Prof. D. M. Dunlop, F.R.C.P.; Dr. F. Gray; Dr. P. Hamill, F.R.C.P.; Mr. J. C. Hanbury, F.R.I.C.; Dr. G. MacFeat; Prof. Chassar Moir, F.R.C.O.G.; Dr. A. Smith Pool; Mr. J. H. Ramsay, PH.C.; Dr. W. D. D. Small, F.R.C.P.E.; Sir Henry Souttar, F.R.C.S.; Mr. D. E. Sparshott, M.P.S.; Dr. J. G. Thwaites; and Alderman W. J. Tristram, M.P.S.

At its first meeting the committee elected Sir Henry Cohen as chairman and Professor Dunlop as vice-chairman.

This new body is additional to the joint committee[1] which the Minister of Health asked the Central Health Services Councils to set up with a view to deciding, for the purpose of prescriptions, what substances are medicines and what are foods. We understand that the latter committee is already sitting.

Dr. C. O. HAWTHORNE, a former chairman of the representative body of the British Medical Association, died at his home in Hove on Oct. 24.

The next session of the General Medical Council will open on Tuesday, Nov. 22, at 2 P.M., when Sir Herbert Eason, the president, will deliver an address.

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[1] See *Lancet*, 1948, ii, 1020.

glass-clear plastic which allows the patient to see everything going on around him and merely intercepts his droplets. Bedside commodes are now in regular use; the light chromium pan, with a fitting lid, is set beneath an ordinary lavatory seat in a wheel-chair. The pan, and the rack which carries it, can be removed, and the seat will then fit over the pan of the ward water-closet. The nurses find that patients generally prefer being taken to the lavatory to using the commode at the bedside; and if they are well enough to get into the chair they are usually fit to be wheeled to the closet.

Each patient has his own thermometer in a test-tube hung in a clip at the head of his bed. His wireless headphones plug into a switch by means of which he can select his programme. For those who are not up to using headphones, 'Pillotones' are provided. These are about as big as a Yorkshire parkin, and lie comfortably under the pillow delivering music, vaudeville, or Women's Hour softly into the sufferer's ear. The wards are newly painted in a gentle oyster shade known locally as "putty B" or "Matron's grey"; and the green curtains of the cubicles look well against it.

The empty-bed puzzle has also been very largely solved. The difficulty has always been that, as every chief has his own beds, a gynæcological case can never be put into an E.N.T. bed, or a patient with asthma into the bed of a neurologist. And as every houseman guards his chief's beds like Cerberus, there are apt to be empty beds in inconvenient parts of the hospital. At the London every ward has a side-room with a single bed in it which nobody can fill but the matron or the house-governor. If a patient needs to be admitted to a ward which is already full, one of these officers does a little juggling. A patient due to go out is moved into the side ward for a day or two, and the newcomer gets his place. These side wards mean that there are always 10 unallotted beds in the hospital which cannot be claimed by housemen on behalf of their chiefs; and by the judicious use of these the empty-bed rate has been reduced from 21%, before the war, to 5%.

Patients' relatives make their telephone inquiries direct to the ward, and receive a much fuller account than is possible when inquiries are answered from the gate. The task of dealing with these calls is among the duties allotted to the newly appointed ward clerks.

MOTH-BALL ANÆMIA

IN England the moth-ball is gradually disappearing, its place being taken by D.D.T. in various forms. But in the United States the traditional moth-balls are still in current use, at least among the negro population. Now moth-balls are shiny glittering objects, just the kind of thing that any child of 2 years or so would want to put into its mouth, and the piccaninnies of Detroit seem to like sucking them as well. For Zuelzer and Apt[1] report four cases of acute hæmolytic anæmia in negro children of this age, all due to sucking moth-balls; and surely the surprising part of their paper is that they could not find any previous reports of such cases. The explanation may be that those who treated the patients never thought of asking about moth-balls; Zuelzer and Apt had always to probe for the history—for instance, in one of their cases a neighbour had seen the child sucking a moth-ball.

Moth-balls are composed of pure naphthalene, and this chemical is presumably responsible for the syndrome that comes on 1 to 4 days after ingestion. The child looks listless and ill, may vomit and have diarrhœa, and goes pale but not icteric. Quite soon the urine turns a "port-wine" colour and tests reveal hæmoglobin in it; no porphyrins are found. The free hæmoglobin in the plasma is considerably increased. The blood smear shows fragmented red cells, and in one patient (Heinz) bodies were found inside the red cells. T severe anæmia, with hæmoglobin levels reduced to 5 per 100 ml. or less; there is a well-marked leuc and many nucleated red cells appear. The red show spherocytosis and increased fragility in solutions. All tests for abnormal agglutinins hæmolysins are negative. Reticulocytes appear tually and their increase heralds the recovery. All this is typical of the picture of an acute anæmia due to any cause. Zuelzer and Apt could no other cause than naphthalene poisoning in young patients. But they decided to put the the test by feeding known amounts of flake to dogs. The clinical picture seen in the children accurately reproduced in the dogs; the of erythrocytes and the Heinz bodies were also when reticulocytosis occurred the number of bodies declined and recovery set in.

All four children were treated with blood- and recovered without incident. It is clear that if history of sucking moth-balls had not been the diagnosis might have been Lederer's anæmia; the presence of acute anæmia and spherocytosis might tempted some clinician to diagnose an acute phase of hereditary spherocytosis and to recommend splenectomy. Splenectomy has no place in the treatment of such cases; they will recover if tided over the acute phase by blood-transfusion. Not much moth-ball anæmia is likely to be seen in this country, but the report will remind us how well worth while it is to take a thorough history.

ESTIMATING THE DEPTH OF BURNS

IN fresh burns it is often impossible to tell by eye whether the skin has been totally or only partially destroyed. Yet the information may be important because excision and grafting of a burn will save much time if the skin is totally destroyed; whereas it is meddlesome, if not positively harmful, to excise and graft a burn which still contains living epithelium and will heal rapidly by itself. A few days must usually elapse before the depth of burning can be estimated clinically, and meanwhile infection may have occurred to jeopardise delayed surgical enterprises. Various attempts have been made to devise immediate tests for the degree of skin destruction. Dingwall[1] has suggested intravenous fluorescein and examination of the burn under ultraviolet light for fluorescence. Patey and Scarff[2] used Van Geison's stain (picrofuchsin) on fresh burns and found that areas of partial skin loss stained pink whereas total skin destruction resulted in yellow coloration.

The latest of such tests has been devised by Bull and Lennard-Jones,[3] at the Birmingham Accident Hospital. Following the knowledge that burned surfaces became partly or completely anæsthetic, they investigated the sensitivity of experimental burns produced on themselves. Pain was found to be the most reliable of the skin sensations and was evoked by using weighted needles. Partial-thickness burns showed diminished pain sensibility, whereas full-thickness burns were completely or almost completely anæsthetic with a surrounding zone of hyperæsthesia. Using needles weighted to 3 or 6 grammes with blobs of solder, they investigated actual burns in six patients and confirmed the experimental results. Biopsies and clinical progress, both in the experiments and in the cases, confirmed the depth of burning. Without disparaging the careful and valuable observations of the Birmingham workers, one may wonder how a test of this kind, which depends invalid as being contrary to section 51 (23A) of the monwealth constitution; but it was severable ı the rest of the Act.

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[1] Zuelzer, W. W., Apt, L. *J. Amer. med. Ass.* 1949, 141, 183.

[1] Dingwall, J. A. *Ann. Surg.* 1943, 118, 427.
[2] Patey, D. H., Scarff, R. W. *Brit. J. Surg.* 1944, 32, 32.
[3] Bull, J. P., Lennard-Jones, J. E. *Clin. Sci.* 1949, 8, 155.

r. Justice McTiernan, dissenting from "conscription," that the material aid given by a scheme to cater human needs was commonly described by the word nefit." Applied in this sense, the word signified ecuniary aid, service, attendance, or commodity e available for human beings under social-welfare ocial-security legislation. State law commanding ıctor to sign a prescription or to date it would not ıge the doctor in the service of the State. It would be a form of conscription. This section did not ide for any form of civil conscription. The Act not by any form of law call on any doctor to serve Commonwealth. No doctor was any less a private titioner than he was before the Act was passed. loctor was legally free to decline to write any cription under section 7A.

Public Health

PERIENCE WITH B.C.G. VACCINATION OF STUDENT NURSES

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HIS is an estimate of the Mantoux state of the nurses he country branch of the Royal National Orthopædic pital over the last three years, and a report on the G. vaccination of Mantoux-negative student nurses at same hospital in the past year.

MANTOUX STATE ON ENTRY

he total entry in the three years was 157. Of these, were Mantoux-negative and 85 Mantoux-positive on val. The figures for the third year (37 Mantoux-ative and 17 Mantoux-positive) contain a much ler proportion of Mantoux-negative reactions than se obtained in the earlier two years (35 Mantoux-ative and 68 Mantoux-positive).

or most of the period under review Mantoux tests e done with Old Tuberculin in dilutions of 1/10,000, wed if necessary by 1/1000. During the last six iths the nurses negative to 1/1000 were tested with 0. Of the 20 new entrants in this period 12 were ative to 1/100, 6 were positive to 1/10,000 or 1/1000, only 2 who were negative to these dilutions were itive to 1/100.

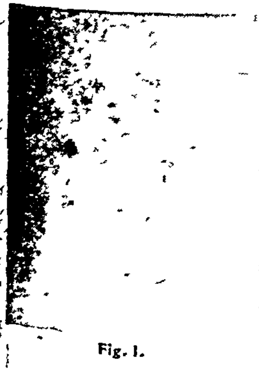


Fig. 1.

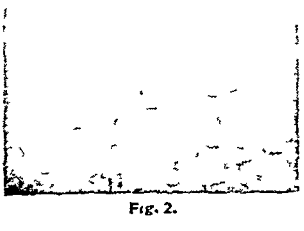


Fig. 2.

1—Papules developing after intradermal multipuncture of B.C G. (Actual size.)

2—Lesion obtained by intradermal injection of B.C.G., in a rurse from Scandmavia. (Actual size.)

During the first four months a commercial ready-diluted Old Tuberculin was used for the tests. This was supposed to be reliable for three months, but one nurse whose chest radiogram showed a healed primary lesion reacted negatively to 1/1000; so a change was made to freshly made dilutions. The same nurse when retested was then positive to 1/10,000.

At the country branch there are about 100 cases of orthopædic tuberculosis. Open pulmonary cases are not taken or kept, however, and it is believed that the risk of contracting tuberculosis is no greater here than in normal life. This is borne out by the fact that there were, during the two years before B.C.G. was used, only 2 cases of Mantoux conversion in addition to the spurious one already mentioned. Each nurse had her chest radiographed, and the tests were repeated on all the Mantoux-negative student nurses at six-month intervals from entry.

A high proportion, therefore, of the girls beginning their nursing training at this hospital were Mantoux-negative and support was obtained for the belief that the risk from contact with our cases was minimal. Most of these girls start at Stanmore at about 17 years of age and go on to their general training after two years. It therefore became apparent that their time here was a useful period in which they might be converted to Mantoux-positive before meeting the probably greater risks of a general hospital.

B.C.G. VACCINATION

From October, 1948, B.C.G. vaccination was offered to the student nurses. Approval was obtained from their parents, and only one offer was refused.

Technique

Since B.C.G. vaccination was a new departure in British hospitals, it was thought wise to use the method least likely to give any untoward effects. Intradermal multipuncture was therefore chosen. The vaccine was spread on the skin of the upper arm after cleansing with ether. Forty small punctures were then made with a Hagedorn needle "on the flat."

There were no glandular enlargements, painful or otherwise, and in no case did any weeping lesion develop. All that happened was that in some cases various numbers of small papules about 1–2 mm. in diameter became visible in 10–30 days and disappeared in about the same time. Fig. 1 shows the papules obtained by this method, and fig. 2 a small single lesion obtained by intradermal injection in a nurse who came to England from Scandinavia shortly after receiving B.C.G.

Results

The following are the results so far obtained:

Nurses inoculated		26
Previous Mantoux state	Neg. to 1/1000	17
	Neg. to 1/100	9
Of the 26 inoculated—		
Papules were seen in		16
Papules were not seen in (one nurse was inoculated twice)		11

Of the 16 with papules, 15 were converted: 1 to 1/10,000, 1 to 1/1000, and 13 to 1/100.

Of the 11 without papules, 4 were converted: 1 to 1/1000 and 3 to 1/100; 2 other students gave up nursing and could not be tested.

The first five inoculations were made with B.C.G. 0·5 mg. per ml. Of the student nurses so inoculated, 4 developed papules and were converted. The 1 without papules remained Mantoux-negative to 1/100. The other 21 inoculations were made with B.C.G. 10 mg. per ml., as recommended by Dr. Wassen for the multipuncture method.

Thus the total number of conversions in 26 inoculated nurses was 19; 2 could not be tested; and 5 definitely remained negative.

Special Articles

PHARMACEUTICAL BENEFITS IN AUSTRALIA

Act Declared Invalid

FROM AN AUSTRALIAN CORRESPONDENT

By a four to two majority, the judges comprising the full high court of the Commonwealth of Australia have declared the Pharmaceutical Benefits Act to be invalid. The judgment was announced on Oct. 8.

Sir John Latham (the chief justice), Mr. Justice Rich, Mr. Justice Williams and Mr. Justice Webb held that section 7A of the Act amounted to a form of civil conscription. Mr. Justice Dixon and Mr. Justice McTiernan, dissenting, held that the Act was valid. The Chief Justice and Mr. Justice Williams also held that the invalidity of section 7A did not affect other provisions of the Act; if it were struck out, they said, the Act would work as a completely voluntary scheme. Section 7A prescribes that a medical practitioner should not write prescriptions for medicines in the formulary except on a prescription form supplied by the Commonwealth.

The defendants—the Commonwealth government, the Commonwealth director of health (Dr. A. J. Metcalfe), and the minister for health (Senator McKenna)—had demurred to a statement of claim by the British Medical Association and six New South Wales doctors. The defendants contended that the Act and regulations were within the Commonwealth parliament's powers.

The *Pharmaceutical Benefits Act was passed in 1944.* It was challenged and declared invalid in 1945. The next year, section 51 of the constitution was amended to give the Commonwealth power to provide social *services, including medical benefits, but not so as to* authorise any form of civil conscription. The Commonwealth government also relied on section 51, which gives it power to make laws in respect to "matters *incidental to the execution of any powers vested by the* constitution."

The B.M.A. claimed that the Act, and regulations made under it, went beyond the powers conferred by the *1946 constitutional amendment, and that they involved* a form of civil conscription of doctors; and that doctors would be hindered in the proper treatment of their patients by the requirements of the Act. It claimed *that the Act was invalid, or that seven sections and* twelve regulations were invalid.

CIVIL CONSCRIPTION

The Chief Justice said that the power granted to the Commonwealth government in 1946 under section 51 of the constitution did not entitle the government to make laws on pharmaceutical benefits and medical services, but only to provide such benefits and services. A power to make laws on medical services could be held to authorise a law for the complete control of medical services, and would *enable the government to control* medical practice completely. Similarly, a power to make laws on pharmaceutical benefits could authorise a law for the complete control of pharmaceutical chemists' business. "The object of conferring on parliament the power of providing pharmaceutical benefits was to provide these benefits under a scheme which would leave anyone at liberty to take part or stand aside, whether as doctor, chemist, or patient." The Chief Justice concluded that section 7A imposed a form of civil conscription and was *invalid, but this did not* affect the validity of any other provisions of the Act.

Mr. Justice Rich, agreeing with the judgment of "civil conscription," said that the original Pharmaceutical Benefits Act *was found invalid by a majority* of the high court *because it was considered* that power of appropriation of money under section 81 of constitution did not extend to payments for allowance, child endowment, and widows' since *social services were limited by* section 51 to invalid and old-age pensions. The addition to constitution in 1946 allowed for "the provision maternity allowances, widows' pensions, child ments, *unemployment, pharmaceutical,* sickness, hospital benefits, medical and dental services (but so as to authorise any form of civil conscription), ber to students, and family allowances." Mr. Justice *held that these services were to be provided* by Commonwealth and not by any State or other. The phrase "civil conscription" was, he said, thing of a novelty; military conscription and indu *conscription were a familiar combination. The* mentary draftsman had apparently shied at the simplicity of the word "compulsion," but, he thou that the phrase meant "compulsion in connexion w *medical and dental services." The crucial* questi was whether section 7A imposed civil conscription thus interpreted. Admittedly no-one was compell to adopt the profession of medicine; but, if he did *he was affected in his freedom of practice* and in h means of living unless he subscribed to the schem whereby he was subject to control as to the form treatment and the drugs he might prescribe. For th *general practitioner, non-compliance meant* loss practice. The use of a particular prescription was mere automatic action. It was the result of the prac tioner's examination, diagnosis, and choice of the trea *ment which his knowledge and skill dictated;* it the culmination of the medical service rendered by practitioner to the patient. This might perhaps be compulsion in the sense in which the word was u *in connexion with military service,* but it was a form civil conscription.

ANALOGIES

Mr. Justice Williams, *also agreeing* with the "ci conscription" judgment, said that it would no dou be a form of industrial conscription to compel people law to work in industries, whether industries w *carried on by the Common*wealth, or by the States their authorities, or by private individuals. It wou be equally a form of civil conscription of medical or de services to compel medical practitioners *to carry on* th *professions in particular* localities. A medical practiti was compelled to render that service in the cour rendering a contractual service to his patient, but it a service which formed no part of an implied contr for services created by a patient seeking the advice a treatment of a medical practitioner, and the practition examining the patient with a view to giving him and treatment.

Mr. Justice Webb, agreeing on the "conscr judgment, said that, when parliament came be patient and doctor and made lawful continuance of relationship as such dependent *on a condition,* en able by fine, that the doctor should render the a special service unless that service was waived by patient, it created a situation which amounted form of civil conscription. This civil conscription be avoided without any *breach of the law to the* e that the doctor vacated the field of medicine, w however, would involve in many, if not most, ca considerable loss of *practice* and income. But it was civil conscription. Military conscription would cease *to be such because those liable to* fight migh avoid it by a change of occupation. To amount civil conscription it was not necessary that the servi should be a full-time service, or should be rendered a member of a corps created for that purpose. Section 7

Disabilities

41. MANIC-DEPRESSIVE PSYCHOSIS

AM what Harley Street calls a manic-depressive, and ave been told, in that street, that I am a pronounced e. My malady did not establish itself until after I rried at the age of 37—in other words, until after my ains of living were inevitably multiplied, as for a man longer concerned only to keep going himself. But ad earlier noted signs of something weak in me: the efest being that, if I opened some hard book to read, h as Butler's *Analogy*, after twenty minutes or so I s as one dragged down into sleep. Then one dark ht, as I was walking on the beach, I became aware t the right side of my forehead felt as, in winter, a mb finger does. Standing still, I struck that side h a clenched fist, and my thought was that if what I t as an obstruction there to the circulation of the od should break down I could make something of life: terwise I was doomed to mediocrity.

I was then 18 or 19: I am now 73, and my life-course nearly 40 years has been a succession of alternate iods, each some 4½ months long, of unusual intellec- al activity and of overpowering lassitude: not such edness as follows an excess of physical or intellectual rtion, which with rest passes off, but a poison-tired- ss. The periods might almost have been measured by ate, one of the fabled Three, with a watch in her hand. ave become used to thinking of them as "up-times" d "down-times," and it will help me if I may use se terms.

For 40 years, then, I have lost half of each year for at can be called work; but during the up-times, en I always feel gorgeously well, nothing seems to tire e, and it is easy to do a double day's work, I have ked so hard that my output (I am a writer) compares t unfavourably with that of those who have kept at rk all the year. Just as I have been able to make arrears of my official work in the up-times, so have been able to make it up afterwards with my friends. I need not take your silences amiss," one lady once idly said, "you just *have* to hibernate.") I write both se and prose, lyrical poetry and literary criticism. y it not be that, had I not been a manic-depressive, hould have written no poetry? It has been thought at the urge to write poetry proceeds from a condition some degree pathological. If that be so, and if a man e had pleasure and joy in writing poems he would not ve written were he not pathologically conditioned, should not regard himself as having been compensated?

Born of scholarly parents, and since associated in ship and friendship with scholars, I have tried to come a scholar myself; and I still persist in the tempt, though nearly 40 years ago the hopelessness of all was forcibly brought home to me. I had spent much the preceding up-time teaching myself Sanskrit: ading the prose parts of the *Hitopadesa*. Then followed down-time, when perforce I laid that volume of fables ide, and by the time of recovery I had forgotten almost ery word of the language. It has been the same with many attempts to become a Persian scholar: I get each down-time all I have taught myself: so at I must say, jestingly, that all the Persian that abides ith me is *zulf-i-pareshan*—"dishevelled locks."

My disability must be regarded as a slight one compared ith most others; and as one, at least in my case, not eleterious to general health. In my 70s I still mb the Wensleydale hills with no more effort than I lt when I was 20. As a compensation for the down-times, experience a fire and exultation in the up. But I have ad to get through the times of depression, and the hought of each one as lying ahead has been a strong pur to me (perhaps too strong) to make a good use of my activities. For when I can no longer work I thus have something to remember as accomplished, to help counteract the feeling of being guilty of some crime for which I am wanted by the police, a feeling I have always had to contend with.

Before I pass to the palliatives, I must dwell on what I have had to palliate. The worst trouble I have just had to grin and endure. This is the craving for more sleep in the down-times, which I feel on waking every morning, and after every short sleep during the daylight hours. Mercifully, getting up and doing what must be done usually reduces the craving appreciably, and I normally feel much less heavy and tired during the last hour or two of each day. Often I have only got through getting up, washing, dressing, and having my breakfast by knowing that I should be free to go to sleep again immediately after the meal, either in my own room or seated on a bench in a park. I have discovered no palliative for that part of the trouble: and it has been on waking (only then) that I have often thought it would be sweet and pleasant if, as I turned a street corner, the bullet of an assassin, meant for another head, entered mine. In down-times, feeling a numbness in my head, as if it had nothing but a lump of damp sawdust inside, I have thought it would be pleasant, for the mere change of sensation, to jab a needle through my skull.

One day I made a discovery. I had waked with a craving for more sleep, and was proposing to fall asleep during the day over a book, when I was summoned to be ready, having packed for a lengthy stay in a Himalayan hill-station, to conduct two schoolboys late that day to a station en route, to continue the journey myself, and in the hill-station to find and rent a house for the party. An instinct led me to pass through my mind as much of Shelley's *Ode to the West Wind* as constant reading had taught me. I found I knew it all except the beginning of the second verse—some seventy lines. These I passed through my mind all day, never stopping: in the train I even recalled the missing lines by concentrating on the rhymes in those that I knew. In this way I prevented my mind being preyed upon by thoughts of the police.

That led me to another discovery, but not until long years had passed. This was that, during a down-time, when I do no work and have consequently a mind empty except for fear, I can memorise verse more easily than at any other time. So in the last down-time I started at the beginning to memorise Racine (*Bérénice and Phèdre*); the time before it was Virgil, Dante the time before that, and on another occasion book XII of *Paradise Lost*.

The lassitude of the down-times has been so heavy, so paralysing, that I have had to shape my days so that I could do all my work in the up-times. And then, too, I go for the long walks that are my form of exercise. During the down-times any intellectual activity is so far beyond the power of my brain to perform that it is only sensible not to think at all, to avoid as far as possible all intercourse with others, write no letters, and fill in the many hours with the reading of endless books. Thanks to there being eight volumes of them and to the print being small, I got comfortably through most of one down-time with Greville's *Memoirs*, and through another with Carlyle's *Frederick the Great*, also in eight volumes. Long years afterwards my wife, poor soul, said: "How I got to hate Greville's *Memoirs*!"

There are always compensations, let a man but see them as such, and seek them. I have sought compensations (I mean, something to succeed in) in many directions. What stands out is this: since I realised so early in my working-life that I should live under a heavy handicap, I put away the desire to earn my living as a professional writer. I always had, until retiring age, a salaried post; and consequently I never had to write pot-boilers. I have been free to write when and what

Conclusions

(1) *The multipuncture method with a flat Hagedorn* needle produced no significant troublesome lesions.

(2) The conversion-rate of 19 out of 24 followed up left something to be desired, and the slightly greater risk of a local lesion with intradermal injection would probably be worth taking to improve the conversion-rate.

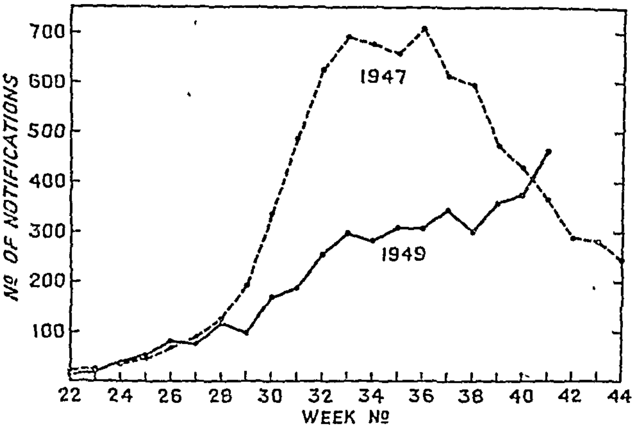
(3) The conversion-rate, in these small numbers of cases, was *as high with B.C.G. 0·5 mg. per ml. as with* 10 mg. per ml.

(4) As might be expected, the development of visible papules increased the chance of conversion, though they were not essential for success.

I am extremely grateful to Dr. A. Wassen, of Gothenburg, and to Professor Wallgren, who introduced me to him. On *numerous occasions in the last year supplies of vaccine have* been sent to England by air from Dr. Wassen's laboratory—a most generous gift. My thanks are also due to Dr. C. H. Lack, pathologist to the hospital, for most of the Mantoux tests, and to Sister Pursall, who has been most helpful in the considerable routine involved.

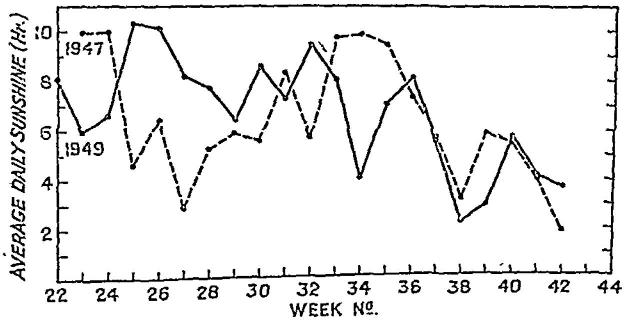
Poliomyelitis

In the week ended Oct. 15 notifications were: poliomyelitis 418 (340), polioencephalitis 45 (34). Figures for the previous week are shown in parentheses. This is a *substantial rise, and it is clear that the curve is following* a different trend from that of 1947. Multiple cases were reported from the following counties:



London 68 (53), Bedford 7 (5), Berkshire 4 (6), Buckingham 2 (2), Chester 7 (5), Cornwall 6 (2), Cumberland 7 (1), Derby 2 (1), Devon 2 (3), Dorset *10 (7), Durham 4 (2), Essex 39 (31),* Gloucester 21 (23), Hereford 3 (0), Hertford 11 (4), Huntingdon 5 (0), Kent 33 (22), Lancaster 32 (24), Leicester 10 (4), Lincs, Holland 9 (0), Middlesex 18 (30), Norfolk 8 (4), Northampton 4 (4), *Northumberland 3 (0), Nottingham 11 (8), Somerset* 9 (6), Southampton 10 (4), Stafford 3 (1), Suffolk, East 3 (4), Surrey 14 (8), Sussex, East 4 (2), Sussex, West 2 (1), Warwick 16 (19), Wiltshire 8 (4), Yorks, East Riding 3 (2), Yorks, *North Riding 3 (3), Yorks, West Riding 48 (50),* Glamorgan 4 (7).

Following the precedent of 1947, the incidence of poliomyelitis should have fallen as autumn began. It has been suggested that the present rise has something to do with the unusual delay in the coming of weather: *has it perhaps been caused by the prol* of summer weather into October? This possibility no doubt be considered, with due regard to the plexities which arise when climatic changes have to analysed. Meanwhile we thought that prima-f evidence might be obtained by comparing the averages for hours of sunshine (in London) during summers of 1947 and 1949. The curves here r *do not, however, show any significant tendency* to those of poliomyelitis incidence.



In the U.S.A. (according to British United Press) Leonard Scheele, the surgeon-general, expects this to have the highest incidence on record, with a tota 40,000–45,000 *cases.*

Quarterly Statistics

THE JUNE QUARTER

The latest quarterly return [1] by the Registrar-Gene shows that in England and Wales the stillbirth-rate the June quarter, 1949, was the lowest for a June quar and equalled the lowest ever recorded for any quar

Births.—There were 4470 stillbirths registered the quarter, giving a rate of 22·7 per 1000 live and st births, *compared with 4746 and a rate of* 22·8 in t same period a year ago. The infant-mortality rate also the lowest recorded for any second quarter; dea of children under 1 year of age numbered 5691, repr *senting a rate of* 30 per 1000 related live births.

The number of live births registered was 192,1 giving a rate of 17·7 per 1000 total population, whi may be compared with 18·8, 21·9, and 19·1 in the seco *quarters of 1948, 1947, and 1946.* Of the births reg tered, 98,821 were males and 93,345 females—a proporti of 1059 males to every 1000 females. Illegitima births were 5·0% of the total, compared with 5 in the corresponding quarter of 1948.

Deaths.—119,984 deaths were registered during quarter, giving a rate of 11·1 per 1000 total populatio This compares with 110,257 deaths and a rate of 10 2 *the corresponding quarter of 1948.*

Natural Increase.—Births registered exceeded dea by 72,182, the corresponding natural increases for t second quarters of the years *1946, 1947, and* 1948 bei respectively 89,900, 117,181, and 93,336.

Survey of Sickness.—Out of 3541 men interviewed, 2 reported having had some illness or injury in February, there were 1775 consultations with doctors; out of women interviewed, 3379 reported having had some illn or injury in the same month, and there were 2413 consulta with doctors. Illness or injury of some kind during a mo *in the period January, February,* and March, was repor by 73·1% of all persons interviewed; the average incapac among all persons interviewed was 1·4 days per month. Amo housewives, 80·4% reported having had some illness or inj during a month, compared with the general level of 73·1

THE SEPTEMBER QUARTER

In the September quarter of this year the number *babies stillborn and the number dying* in the first y of life were the lowest for any quarter. In the follow table [2] the figures for this quarter are compared w *those for the same quarter in previous years.*

Third quarter, year	Live births		Stillbirths		Deaths		Deaths under 1	
	No.	Per 1000 total population	No.	Per 1000 live and still births	No.	Per 1000 total population	No.	Per 1000 related live births
1949	183,278	16·7	4104	21·9	101,207	9·2	4883	26
1948	191,858	17·5	4447	22·7	101,515	9·3	5514	28
1947	216,508	20·0	5073	22·9	97,099	8·9	7141	32
1946	213,051	19·8	5831	26·6	100,409	9·3	7100	33
1938	158,082	15·2	6072	37·0	102,545	9·9	6622	42

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1. The Registrar-General's Quarterly Return of Births, Deaths, Marriages: Quarter ended June 30, 1949. H.M. Sta Office. Pp. 29. 1s.
2. The Registrar-General's Weekly Return of Births, Deaths, Infectious Diseases *for the Week ended Oct. 15,* 1949. Stationery Office. *Pp. 20. 6d.*

PRIVATE PATIENTS AT HEALTH CENTRES

Mr. BEVAN moved an amendment to enable general actitioners to treat private patients in health centres. one time, he admitted, he had set his face against this posal because it was then uncertain what proportion the population would register with practitioners. w, however, the number of patients outside the scheme s so infinitesimal that no danger could arise to the ucture of the service. For this reason also, where health centre was available, the general practitioner ld not be expected to maintain a private surgery his private patients. Regulations to prevent possible crimination at the centre would be framed later. provision would be made that a doctor must have substantial number of patients in the public scheme ore he could avail himself of the private facilities the centre. The amendment was agreed to.

Mr. BEVAN moved a further amendment, which was o passed, to enable executive councils to make differial charges to general practitioners varying with the they made of the health centre for private patients. similar amendment to the Scottish Act was later ried.

Mr. BEVAN moved an amendment providing that Minister should indicate certificates that could be quired from medical practitioners. He said that some ne ago he and the Secretary of State for Scotland pointed a committee to weed out the number of tificates doctors were called on to provide. It was rly obvious that a little streamlining could be done. e committee had issued an interim report and the endment was designed to enable effect to be given to eir recommendations. The amendment was agreed to.

Mr. BEVAN moved a new clause providing that, except health centres, dentists should never be paid wholly mainly by fixed salary. He said that the purpose of e clause was to carry out in the case of dentists the me guarantees or undertakings that were advanced the case of general practitioners. The clause was ad a second time and added to the Bill.

Mr. JOHN WHEATLEY, the Lord Advocate, moved new clause to enable children in Scotland under the e of 16 to be treated as voluntary patients in mental spitals on the initiative of their parents or guardians. is had been the law in England since 1930 and it had rked well. The clause was read a second time and added the Bill.

THE DENTAL SERVICES

Mr. JOHN BAIRD moved a new clause prohibiting y dental practitioner, accepting patients under the ational Health Service, from taking remuneration m private patients. Two years ago he had fought for e liberty of the dental and medical professions to treat th public and private patients and he moved the new use with reluctance. But patients under the public rvice were suffering from the unethical practices of considerable number of dentists, and such rackets must stopped.

In the course of the lively discussion which followed, r. BEVAN declared that the dental profession had been ilty of worse conduct than any other profession in e National Health Service, but he was satisfied that ch misconduct was on the decrease. It was better, thought, to allow the disciplinary machinery established under the scheme to operate. He hoped that before ng good practice would drive out bad practice. The ause was by leave withdrawn.

TREATMENT FOR FOREIGNERS

Lieut.-Colonel WALTER ELLIOT moved a new clause roviding that foreigners who received medical attention nder the National Health Service while they were in his country should make some payment unless the ountry of their residence had made reciprocal arrangeents with this country. The Minister had said that e had made arrangements for immigration officers to urn back aliens coming to this country to secure benefits rom the health service, but that was asking these fficers to carry out a duty which they were not ompetent to perform.

Mr. BEVAN was amazed that it should be assumed o be wrong to treat a visitor to Britain. If we set an example there was every prospect that other nations would follow it. The health services of the whole world now were being stimulated by what was happening in Great Britain. But he agreed that if people came here from abroad to exploit the health service, that was quite a different matter. It was impracticable to impose on the Minister the duty of making regulations to recover from overseas visitors a charge for the use of the health service, and, moreover, if we passed such regulations we should turn our backs on centuries of British tradition. The new clause was by leave withdrawn.

ACCESS TO HOSPITAL BEDS

Colonel M. STODDART-SCOTT moved an amendment to enable a general practitioner or outside specialist to continue looking after a patient who had been admitted to a pay-bed in hospital. Practitioners were particularly anxious to treat their own maternity cases. Sir HENRY MORRIS-JONES said that Mr. Bevan had lately modified his views that there should be a strong line of demarcation between the general practitioner and the specialist, as shown by a recent Ministry circular urging hospitals to give more facilities to general practitioners. Mr. F. MESSER was sympathetic to the idea behind the amendment but could not support its present wording. He doubted if specialisation developed to its present extent was altogether good. No barrier should be placed in the way of improving the standard of the general practitioner. If that meant access to the hospital beds the opportunity should be given to the general practitioner, but in a different way from that proposed.

Mr. BEVAN agreed that there had been a tendency to dig too wide a gulf between the general practitioner and the specialist, but if that gulf was to be narrowed it must be done by agreement between the members of the profession rather than by legislation. What was really envisaged by the amendment was that a specialist not in the public service at all would be able to treat his private patient in a hospital. That was wholly wrong. It had been common ground that a specialist must have ready access to the hospital if he was to do his work properly. That was the reason for the argument against certain nursing-homes. If a specialist was not in the health service and not attached to a hospital, he would not be a person of permanent value in his calling and he ought not to have the facilities of the National Health Service. After further debate the amendment was negatived by 253 votes to 103.

GRADING OF SPECIALISTS

Sir HUGH LUCAS-TOOTH moved an amendment to give hospital specialists who were dissatisfied with any decision as to their grading the right to appeal first of all to a central professional committee and finally to the Minister. He did not say that the grading had been badly carried out, but a great many of those who had been graded felt that they had not been properly judged. The object of the amendment was to try to do away with that sense of injustice.

Mr. BEVAN said there was no academic qualification that corresponded in the medical profession to any hierarchical arrangement. And if according to the hierarchical conception the general practitioner was placed at the bottom, he did not agree with it. He insisted that the first-class general practitioner was the cream of his profession and we must not slip into the language of saying that any person was downgraded or upgraded in relation to whether he was further from or nearest to the status of a general practitioner. In so far as there were different scales of remuneration for people presumed to have different qualifications, the object had been to see that the salary alighted on the right person, so that when a general practitioner sent a patient to a specialist he was really sending his patient to a specialist and not to some person masquerading as a specialist. The task of classification was entrusted, on the advice of the medical profession, to a purely professional body. One of the defects of the amendment was that it suggested that after doctors had been classified by their fellows they should appeal to the Minister. Mr. Bevan added that, as they were classifying people on the grounds of their craftsmanship, particular, immediate, and precise knowledge was needed. Therefore it was a local committee

I wished—to spend my time even on writings for which there could never be a public. I have felt that to be no slight compensation. As you walk along Piccadilly, or up Bond Street, you will pass innumerable persons, most of them quite happy if the sun shines, who have written no successful books, nor ever thought of trying. Why then need I care if my books are none of them what people call successful: if in England I am known as a writer to the fewest?

Medicine and the Law

The Drugs in the Motor-car

A MEDICAL practitioner is required to keep dangerous drugs "in a locked receptacle which can be opened only by him or by some other person authorised." In Birmingham last January a medical practitioner drove to a cinema and left his car in a car-park close at hand, being careful to lock the car doors. Inside the vehicle was an unlocked leather case containing drugs to which the Dangerous Drugs Acts and Regulations applied. Coming out of the cinema at 9 P.M., he found that his car had been stolen. Three days later it was discovered at Walsall; its doors were open; the leather case containing the drugs was still on the back seat.

At the Birmingham police-court he was fined £5 for having failed to keep the drugs in a locked receptacle. The stipendiary magistrate declined to accept the argument that a locked motor-car is a locked receptacle. This decision has now been confirmed by the High Court, to which the doctor had appealed. The Lord Chief Justice[1] conceded that a motor-car might perhaps be described as a receptacle for luggage, but the regulation must be construed in a way which would effect the obvious purpose of the legislature.

By this time the appellant is probably wondering what is the judicial conception of luggage; a suit-case, it seems, is luggage if it contains a tooth-brush and a pair of pyjamas, but not if it contains drugs. "Receptacle," according to the *Oxford English Dictionary*, is "that which receives and holds a thing: something into which another thing may be put: a containing vessel, place or space: a repository." The attention of the court must have been drawn to the dictionary definitions, but the judges prefer a narrower interpretation in their zeal to give effect to what Parliament obviously intended.

One seems to remember that judges ordinarily decline to study the pages of *Hansard* or to speculate on what our legislators must have meant; judicial minds usually confine themselves to what Parliament said, rather than what Parliament intended. All that Parliament said in the Act of 1920 was that the Home Secretary might make regulations about the manufacture, sale, and possession of dangerous drugs. If legislators had been asked their intention at the time, the answer would probably have been that the drugs must be kept safely under lock and key, out of the reach of children or of any casual person who might be tempted to poison either himself or other people. Did any M.P. consider in 1920 whether a locked case in an unlocked car is safer than an unlocked case in a locked car? The "locked receptacle," of course, is not the language of Parliament but the language of the Home Office regulations; the regulations are just as much the law of the land as is a statute, provided that they do not exceed the powers granted by the parent Act; if the doctor's appeal had succeeded, another amending regulation could promptly have prescribed that, for the purposes of the custody of dangerous drugs, the word "receptacle" shall not include a motor-car.

What then must the practitioner do, since the authorities which enforce the law seem powerless to prevent his car from being stolen? Perhaps he can fit a lock to some pigeon-hole in the front of his car, so as to equip himself with an itinerant poison-cupboard. Many doctors, it must be confessed, carry on their persons a small hypodermic case containing enough tablets of alkaloids to kill a dozen people. Often enough their services are needed in an emergency—for instance, to administer morphine to someone pinned beneath an overturned omnibus. Coat pockets cannot be locked receptacles. There are, however, some saving words the Dangerous Drugs Regulations—words introduced our researches have not misled us) in an amen a year ago. To the general insistence upon a locked receptacle for drugs "in the actual custody" of authorised persons there is a sensible exception which covers occasions "when the necessities of the practice of profession, functions or employment require." Does not professional practice require that the practitioner shall hold himself reasonably ready and equipped to give relief to possible patients in any emergency? Or will the public be satisfied, when the services of a doctor are called for in some accident, with the answer "I am sorry, I am not carrying my locked receptacle"?

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[1] See *Times*, Oct. 20.

Parliament

National Health Service (Amendment) Bill

IN the House of Commons on Oct. 19, this Bill as amended in Standing Committee was considered on recommittal. Mr. ANEURIN BEVAN accepted a new clause, moved by Mr. H. Linstead, which introduced a system of interauthority accounting for the ambulance services.

HOW MUCH SHALL THE PRIVATE PATIENT PAY?

Mr. A. J. P. HOWARD moved an amendment to the schedule providing that private patients instead of being required to pay the whole cost of hospital treatment should be allowed to pay only a proportion of that cost. Mr. BEVAN held that the amendment if accepted might give rise to resentment on the part of those who objected to benefits being given to different classes of patients in the public hospitals. There must to some extent be a hang-over from the past, and time would be needed to eliminate certain habits of mind. But he believed that the tendencies were all in a healthy direction and that before many years had passed there would be no sense of discrimination or unfairness in the hospital administration. If the private patients were charged twice, after all that was their fault. Having made a contribution through the taxes to the National Health Service they elected to go outside that service. Furthermore the proposal in the amendment would add to the cost of the service.

Mr. J. A. SPARKS pointed out that some patients elected to be treated privately because they could get into hospital much more quickly that way. Mr. BEVAN replied that he would be unhappy to learn that anybody had been able to pay his way into a hospital ahead of another patient who could not afford to do the same. Even so this was no argument for the amendment. It merely meant that we must provide additional hospital accommodation.

Mr. LINSTEAD declared that one of the principles of the service was free choice of doctor. In the general-practitioner service that principle operated fully. But the only way to get the specialist of one's choice was to become a private patient. Again there were something like 500 hospital management committees in the country and probably 1500 or 2000 hospitals with private beds. There were something like 1500 possible variations in the weekly charge according to the upkeep costs of each institution. Could not the Minister at least fix a standard charge?

Mr. BEVAN interposed that at least 40% of the pay-beds were occupied by free patients, which was a tribute to the way in which the administration was carrying out the terms of the Act.

The amendment was negatived by 256 votes to 139.

In England Now

Running Commentary by Peripatetic Correspondents

WITH me the pursuit of civic virtue is a positive ssion. I'm funny that way. There's hardly an action perform without asking myself. "Does this help or nder the Country in her present plight. or is it. from e standpoint of civic morality. strictly neutral?" u would expect—if you were sufficiently interested—at I might wear a careworn expression, and you would right. The trouble with us would-be-goods is that we n't get enough guidance from the Government. They l us to work harder and not to ask for more pay. ey ration us. They compel us to pay taxes. But ey don't tell us how to behave in a whole lot of other ys. During the war. the good life was so much easier live. By the eating of a surfeit of potatoes. for example. e acquired a degree of spiritual merit which more an offset the concomitant physical discomfort. But wadays one cannot be sure how much, if any. one ght to consume of things unrationed. Ought we. eally, to give up smoking or (assuming we can afford smoke) ought we to smoke more or less American or npire or homegrown tobacco? Ought we to save all e money we can (if we can) and invest it in Government curities? Ought we to spend all we can on enterinment, or nothing at all? Should the good citizen) go dry. (*b*) drink foreign or Empire wines. or (*c*) stick to er or spirits? Or doesn't it matter a tinker's cuss? es, I was afraid that might be the answer.

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I have always wanted to bring up my children scien- fically: so I went to Roffey Park last weekend for the urse inspired by the Institute for the Scientific Treat- ent of Delinquency. My impressions are confused. I n relieved that I have no twins. because it seems impor- nt that they must be placed alternately in the stern the pram to avoid subsequent retaliation on Society. wanted to ask if the "Get forrard you scum" so often n the lips of the Pirate Chief is really a projection of his wn resentment over relegation to the bows of his pram. ut the analysts might have taken it seriously. How ght they seem to be when Dr. Glover is expounding. ut how worrying it all is to a parent!

It was not really like that. The atmosphere of the eekend was essentially practical. Begun by Mr. Claud lullins it could hardly fail to be. In reporting on a elinquent the essential thing, apparently. is to know ne Bench you are advising. Most magistrates are com- letely ignorant of psychiatric terms and are irritated y them. We were also warned that we must never hallenge "punishment": at the most we should restrict urselves to doubting its use as a deterrent in the parti- ular case. Magistrates are also irritated by the word opinion" because it has a specialised. more precise eaning to a lawyer. Several speakers felt that psychi- try was being brought into disrepute by overoptimism, n inevitable result of propaganda on its behalf. It was uggested tentatively more than once that Mr. Mullins imself is too sanguine in his faith in psychiatry. He is ot altogether to blame for this—as one speaker put it, We have sold the magistrates a line and they have alled our bluff." Dr. Alan Maberly underlined this when e advised us to "err on the side of modesty, caution, nd pessimism" in our reports. He also made the mportant point that although we may not be able to cure he patient. psychiatrically speaking. we may be able to hange his delinquent symptoms into less antisocial ones. Miss Cicely Craven dealt with the functions of the juvenile courts and their disadvantages. and described the changed circumstances under the Criminal Justice Act.

A holiday from delinquency took place on Saturday evening when we saw Roffey Park's own propaganda film. Dr. Ling, the centre's director. converted what seemed an oddly hostile audience into an enthusiastic one. His claim that Roffey follows the Greek idea of beauty and peace as good medicine is certainly reflected in the surroundings. The jangled nerves of any industrial worker should be rehabilitated (please note. Mr. Ed., that it is not Roffey Park *Reablement* Centre yet) among those beautiful trees. The centre itself is a converted country house of great charm. Our own quarters were also delightful and I can thoroughly recommend Dr. Ling's offer of them to any appropriate organisation wishing to use them for a weekend course. The food was good, too. I noticed that the programme printed the lectures in small letters and DINNER, COFFEE, and so on in block capitals. The right attitude to food. I feel. Yes. the Greeks would be pleased with Roffey Park. but only the Spartans would like the bath water. It was unfortunate that the rain which pelted on us all the weekend should have flooded the boilers.

A discussion one evening split us into three groups: the mental hospital group under the cunning leadership of Dr. MacKeith appropriated the fire (and Mr. Mullins). It was noticeable how we all seemed to have the same problems. During the small, spontaneous discussions which cropped up during the weekend your reporter found that whenever he detected the glint of battle in somebody's eye, and he crept up with pencil poised over notebook to record an anti-delinquent pearl. the conversation seemed to be about grading.

Altogether a very pleasant weekend.

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After five years in the Navy and four years' whole-time in dermatology I have ventured into rural general practice. On departing from my teaching hospital my wise colleagues raised their hands in horror: "What will you do about midder?" they asked. The answer is that in my two months of practice I have done no midwifery; the district midwives have done it for me. On the other hand. I've seen a lot of skins—a fifth of my patients. I would say.

My very first visit was to a case of vulval herpes which I sent to hospital as such. because it was secondarily infected. The houseman receiving it said on the phone that it must be gonorrhœa, but he had not seen the other three cases of herpes I had seen that morning. A girl with urticaria pigmentosa had baffled her neighbours. but she was delighted when I wrote the name on a piece of paper for her and showed her the picture in *Sutton*. Impetigo abounds. as does animal ringworm. I have learnt that pig fleas may so bite a child as to give it a generalised papular eruption as widespread as measles. A cowman produced an infected hand and asked whether it was cowpox: we read *Sutton* together before we could answer that one. I have of course been too clever. I told the local barber that his child's rash was bed-bug bites. He went straight from my surgery to the rival firm where he got the answer he wanted—"blood out of order." and a bottle of pink medicine. Doubtless the bed-bugs will like the medicine. while the barber's customers will be told how ignorant is the new doctor.

I now have a question to ask my gynæcological friends when they venture into practice: "What will you do about skins?"

* * *

Anæsthetists are such observant people. My friend discovered that tickling the sole of his anæsthetised patient's foot produced a response. in the shape of foot-wiggling, a few seconds before the patient really woke up and began to vomit. Immediately recognising the importance of this fact. he constructed an ingenious apparatus which, he believes. will make all other anæsthetic apparatus obsolete. This is an automatic tickler which gently caresses the sole of the foot with a feather at regular intervals. The minutest wiggle of a toe immediately operates a gadget which injects another dollop of thiopentone into the drip. The patient then sinks back to the depths of anæsthesia and everybody is happy. Anæsthetists will be freed from the present annoying interruptions from patient or surgeon which make it impossible for them to give their full attention to reading the newspaper.

* * *

The distressing gastronomic experiences of your Peripatetic in Sweden were surpassed by those of a colleague who returned from a visit to Central Europe suffering. he said. from Acute Wiener Schnitzophrenia.

* * *

I have a patient who keeps swallowing nails. Is he a nailphile?

that did the classification. Further, the review was being done for the first time in the history of medicine and they were denied precedent. As the first review was bound to be empirical they had decided that a further review—not an appeal—should take place. A person could if he wished have his case referred to a committee of two people outside his region.

Dr. H. B. **Morgan** had always been in favour of some recognised scheme by which specialists and the different grades in the profession can be recognised. But while he had considerable sympathy with the amendment he did not agree with the whole of it. He asked the Minister to look at this problem with a view to meeting this great difficulty in the profession; to see whether some body, professional or mixed, could be brought into being to clean up the profession in a way pleasing to those most competent within it.

Lieut.-Colonel **Elliot** emphasised that a sense of grievance did exist. Many people felt a grave sense of uneasiness and dissatisfaction because of an anonymous decision. He thought that to set up some body, not the local body, would be an advantage, so that people would not be appealing to the same committee again even with two added members.

The amendment was negatived by 241 votes to 97. The report stage was ended and the Bill was read the third time and passed.

The Nursing Profession

On Oct. 21 the Nurses Bill [1] was read a second time. The Nurses (Scotland) Bill had been read a second time the previous day. Both measures were introduced in the House of Lords.

QUESTION TIME

Sickness and Disablement Statistics

Mr. **Rhys Davies** asked the Minister of National Insurance if he was aware that under the approved-society system societies arranged statistical data showing periodically the incidence of sickness and disablement among their membership, separating males and females for the purpose; and if he would give similar details showing any disparity between the statistics under the old and the new system.—Mr. **James Griffiths** replied: Arrangements have been made to collect and publish periodically comprehensive statistics of sickness experience under the National Insurance Acts. But comparison with the figures obtained under the old system will not be possible as detailed statistics were only available in respect of a few approved societies.

Sickness-benefit Claims

Sir **Waldron Smithers** asked the Minister what steps were being taken to supervise sickness claims and to prevent abuse of the provisions of the insurance and health services.—Mr. **Griffiths** replied: The steps taken to supervise sickness-benefit claims under the National Insurance Act are broadly the same as those followed by the approved societies under the old National Health Insurance scheme—namely, careful scrutiny of claims, sick visiting in selected cases, and the use of the regional medical service of the health departments to obtain second medical opinions in cases of doubt.

Doctors' Remuneration

Sir **Ernest Graham-Little** asked the Minister of Health under what sanctions executive councils were subjecting medical practitioners in the National Health Service to a heavy tax upon their payments from the service if they refused to undertake a large panel.—Mr. **Bevan** replied: The regulations governing the remuneration of general practitioners provide for the adjustment of remuneration in the case of a practitioner who is exempted from the liability of having persons assigned to him and is relieved of obligations for emergency night calls in respect of persons not on his list. There is nothing to stop a practitioner limiting his list without applying for these exemptions.

Beds in Children's Hospitals

Sir Ernest **Graham-Little** asked the Minister how many children's hospitals had been closed, or the number of beds in children's hospitals diminished since the National Health Service came into operation; and what was the present number of children's beds in special hospitals and in general hospitals respectively.—Mr. **Bevan** replied: No children's hospital has been closed since the coming into operation of the National Health Service, although two are no longer used exclusively for children. The total number of children's beds available has increased by 1278. The number of children's beds available in general hospitals is now 16,449 and in special hospitals, 23,302.

School Dental Service

Sir **John Mellor** asked the Minister of Education whether he had considered the resolution, unanimously adopted by the representative board of the British Dental Association, criticising his department for failure to provide a facilities for treatment of oral sepsis among school-c and what improvements he was making in con —Mr. **George Tomlinson** replied: The school dental service has been affected by difficulties over the salaries of dentists employed by local authorities. Negotiations are proceeding with a view to the formation of a Dental Whitley Council and the Minister of Health and I are hopeful that agreement will soon be reached on its formation. Once this is done I hope that, with the prospect in view of a salaries settlement, the school dental service will be restored to its former efficiency.

Slot-machine Sales of Contraceptives

Replying to questions by Sir **Henry Morris-Jones** and others on the danger to public health likely to result from the sale of contraceptives from automatic slot-machines, Mr. **Chuter Ede**, Home Secretary, stated: I have come to the conclusion that the social mischiefs involved are so serious as to require immediate action. I have accordingly given instructions for a model by-law to be drafted prohibiting the sale of contraceptives by means of automatic machines. This model by-law will be circulated to all county and borough councils for their consideration, and, if adopted, will be subject to confirmation by me.

Spectacles

Replying to questions, Mr. **Bevan** said that there were still delays in supplying spectacles of anything up to six months or so, but by no means all cases took as long as that, and better supplies were improving the position steadily. The number of spectacles ordered in the two years ended Sept. 1, 1948, and 1949, were respectively 4·5 million and 9·9 million.

Food-poisoning

In answer to a question Mr. **Bevan** stated that the number of outbreaks of food-poisoning reported from 1935 to 1938 were respectively 137, 82, 94, and 156; and from 1945 to 1948, 422, 598, 765, and 964.

Help of Protection Societies

Sir **Ernest Graham-Little** asked the Minister why he had refused the assistance of the Medical Defence Union to doctors who were accused before the medical services committee of professional negligence; and whether he would withdraw this prohibition.—Mr. **Bevan** replied: The regulations permit a party to an investigation by any service committee of an executive council to be assisted in the presentation of his case by some other person, provided that no person shall be entitled, in the capacity of counsel, solicitor, or other paid advocate, to conduct the case for any party by addressing the committee or examining witnesses. I see no reason to alter these arrangements.

Care of Young Cripples

Mr. **Walter Fletcher** asked the Minister of Health what local authorities had made provision for the housing and care of young crippled persons who had completed their schooling at Shaftesbury or similar homes.—Mr. **Bevan** replied: Residential accommodation for persons in need of care and attention not otherwise available to them is provided under the National Assistance Act by local authorities in homes managed by themselves or by voluntary organisations. I am not aware that any local authority has established a home for cripples. My advisory council is considering what guidance might be given to local authorities on the welfare of handicapped persons generally. Meanwhile my regional welfare officers will give what help they can in individual cases.

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[1] See *Lancet*, 1949, i, 842, 938.

d conjugates, and the quantity required to be hydro- ed for the maintenance of health and normal blood-formation is probably less than 1 mg. daily. Moreover, normal individual is capable of obtaining this quan- y of free folic acid from the small amounts of folic-acid jugates in the food despite the fact that natural ds are often rich sources of conjugase inhibitors. If atient with pernicious anæmia were able to obtain r 2 mg. of free folic acid daily from his food he would develop a megaloblastic anæmia, for it has been wn that the oral administration of folic acid in these all quantities will transform the megaloblastic bone- rrow back to the normoblastic state. Since there is satisfactory evidence to suggest that addisonian nicious anæmia is a direct dietary deficiency disease, follows that a megaloblastic anæmia develops in this dition *because the patient cannot procure, from* the tural foods which he eats in normal quantities, the all amount of folic acid required for the maintenance normal blood-formation. It would appear to be a sonable assumption that this failure to procure free ic acid from natural foods must be closely linked with production and absorption of vitamin B_{12}, which in m is directly related to the secretion of Castle's rinsic factor by the stomach. The mechanism by ich vitamin B_{12} enables the normal individual to tain or utilise free folic acid is unknown. Whether is effect is produced by a mechanism working in parallel es or in series is also unknown. Without further owledge all that can be suggested at the present time that vitamin B_{12} may act by facilitating the release of lic acid from the conjugates present in natural foods, alternatively, it may promote their absorption and ilisation in some manner as yet not determined.

In considering the pathogenesis of the megaloblastic æmias it is essential to remember that in certain cases sociated particularly with malabsorption, malnutrition, id pregnancy, and occasionally in cases for which no tisfactory explanation is available, the response to the renteral injection of potent liver extracts may be poor absent. This finding has been confirmed during the ist year by distinguished hæmatologists in America ho have recorded megaloblastic anæmias refractory to ie parenteral injection of vitamin B_{12}. In a paper on le megalocytic anæmias published in THE LANCET 949, i, 295) Dr. Wilkinson insinuates that the refrac- riness to liver extracts reported in recent British ublications by experienced hæmatologists can be largely xplained by a failure of the authors to take the ele- entary precaution of using potent liver preparations. his insinuation is quite unwarranted. Moreover, he rther confuses the problem of refractoriness to liver xtracts by stating that he has never seen uncomplicated ases of addisonian pernicious anæmia refractory to otent liver extracts, thus suggesting that the case- eports describing refractory megaloblastic anæmias elong to the category of addisonian pernicious anæmia. o such suggestion has ever been made by myself or ny of my co-workers in this field. In fact, a failure to espond to adequate doses of potent liver extracts or B_{12} ould be considered by myself as the best possible proof hat the patient was not suffering from addisonian ernicious anæmia, since the primary fault in this con- ition is a deficiency of vitamin B_{12} and this would be utomatically corrected by parenteral replacement herapy. On the other hand, in cases of megaloblastic næmia refractory to potent liver extracts or vitamin B_{12} t is reasonable to assume that the fault does not lie in deficiency of vitamin B_{12}—otherwise it would be orrected by the administration of this factor—but is elated to a defective intake of the conjugates of folic cid in natural foods or to a failure in their absorption r utilisation for reasons not understood. On this basis t is possible to explain why all cases of addisonian pernicious anæmia respond to vitamin B_{12} while other patients with a megaloblastic bone-marrow, identical in appearance with that found in addisonian pernicious anæmia, can be partially or completely refractory to this vitamin. In my experience and in the experience of many leading American hæmatologists whom I recently consulted, every case of megaloblastic anæmia will respond to free folic acid, although in some cases continued maintenance treatment may not sustain a normal blood-level. This is what I would expect if the assumption is correct that the ultimate factor in the maintenance of normoblastic blood-formation is free folic acid. I have only been able to find in the literature records of some 3 or 4 cases in which it was claimed that a failure in response to free folic acid occurred and was then followed by a response to liver extracts. This is an extremely *small number of reported failures when one* considers the thousands of cases which must have been treated with folic acid. Moreover, the case-reports were not all sufficiently documented to permit an accurate assessment of the data given.

Much more work will have to be undertaken before the vexed problem of the interrelationship of folic acid and vitamin B_{12} is solved, but with the present knowledge available it is my belief that both folic acid and vitamin B_{12} are required for the prevention of megaloblastic blood-formation. Finally, I submit that a careful scrutiny of the data presented by Drs. Wilkinson and Israëls in your issue of Oct. 15 does not warrant their deduction that patients with addisonian pernicious anæmia have a normal capacity to release free folic acid from its conjugated forms, or that folic acid or its conjugates play no major part in the ætiology of the human pernicious-anæmia syndrome.

Department of Medicine,
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STANLEY DAVIDSON.

VACCINATION UNDER THE N.H.S. ACT

SIR,—In his letter of Oct. 22 Dr. Killick Millard takes me to task for "begging the question" of infant vaccination in the concluding paragraph of my article in the October number of the *Monthly Bulletin of the Ministry of Health and Public Health Laboratory Service.* Dr. Millard's dislike of infant vaccination is well known. Unfortunately the evidence on which his views are based, and also those of many who disagree with him, is frequently distorted by less critical persons who seek to discredit not only infant vaccination but all vaccination against smallpox, and incidentally immunisation against diphtheria as well. This accounts I think for a certain reticence, which might appear at first sight to be "question-begging," in the references to this subject in official and other publications.

In my article I did not attempt to discuss the pros and cons of infant vaccination and certainly did not intend to minimise its difficulties and dangers, of which I am well aware, as may be seen from an article on *postvaccinal encephalomyelitis in the April, 1948,* number of the same *Bulletin.* During the past eighteen months I have met doctors concerned with the control of smallpox in Holland, France, and other European countries as well as in the United States and Canada. All of them I found were aiming, though with varying success, at a well-vaccinated child population as an important part of their own national defence against smallpox. I was therefore concerned in my recent article to set out in some detail the current position of infant vaccination in this country and to point out that by our apparent neglect of this procedure we are giving the impression abroad that we do not regard protection against smallpox as a serious matter at the present time. I submit that the paragraph quoted from my article can and should be read in this sense.

Ministry of Health.

E. T. CONYBEARE.

Letters to the Editor

ROYAL MEDICAL BENEVOLENT FUND

SIR,—Extra comforts at Christmas time are a great help in time of need—the little extra coal, the urgently needed warm clothing, the wherewithal to provide a real Christmas dinner. I appeal to members of the medical profession to bring these comforts to their less fortunate professional brethren, or to their widows and children who are beneficiaries of the Royal Medical Benevolent Fund. Not only will gifts bring them comfort and cheer, but their hearts will be warmed by the kind thought for them.

I hope that all, whether subscribers to the Fund or not, will send donations to provide this little extra cheer, and that those who are not subscribers will become regular supporters of the medical profession's own benevolent fund.

Donations and subscriptions, marked "Christmas Gifts," should be sent to the Secretary of the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and will be gratefully acknowledged.

WEBB-JOHNSON
President.

ACUTE MASTITIS

SIR,—We read with interest and appreciation Mr. Walsh's article in your issue of Oct. 8, but note that he regards treatment by aspiration, after a trial with 5 cases, as inefficient.

During the past twelve years or so some 300–400 cases of breast abscess have been treated by aspiration at this hospital. First, before penicillin was available, aspiration was performed often 2–3 times a day; then penicillin came in and was used to fill the cavity; and finally systemic treatment came with the purer forms of penicillin (as well as the local treatment), 300,000 units of procaine penicillin being injected twice daily.

During this period only one or two cases have had incision before aspiration had been tried. The advantage of aspiration is that the patient need not be admitted to hospital unless her temperature be high. Except for a few cases where the organism was other than *Staphylococcus aureus* (there were 2 cases of proteus infection) the condition has usually been cured in 7–14 days; and the cosmetic results are almost perfect, the breast returning to normal.

Breast-feeding was not stopped unless pain was excessive, or the abscess was too near the nipple and unpleasant for mother and baby. In the vast majority of cases no pain or discomfort is felt with aspiration under local anæsthesia.

Lewisham Hospital,
London, S.E.13.

H. NOCKOLDS
E. MORAGAS.

LIMITATIONS ON PRESCRIBING?

SIR,

"Aristotle thought that if the individual was not allowed to choose his physician but must go to the one assigned to him by the magistrate under a law, it would be necessary for the law to fix the definitely prescribed prescription for every ill."

"A committee, headed by Sir Henry Cohen, was drawing up a list of drugs that could be provided by general practitioners."

The first statement was made by Dean Pound in an address given before the Massachusetts Medical Society; the second is attributed to Mr. Bevan.

It has long been felt that the increasing cost of the medical service would impose upon the authorities the need to find ways and means of reducing the financial burden to the State. Are we to infer from the Minister's statement that he is going to impose upon general practitioners a formulary which it is compulsory for them use? Or is it that the formulary will bear a reference: "Herpes—turn to page 5—only the following drugs may be used." ?

I deny any suggestion that Sir Henry Cohen or his colleagues have the intention of imposing upon doctors any such patronising tutelage. Nevertheless I have a disturbed feeling that the statement, "that could provided by medical practitioners," might be altered by regulation to "that must be provided. . . ." If this intention is absent, then I doubt the wisdom of assessing the value and the specificity of the multitude of drugs, both proprietary and otherwise, which are in common use. Perhaps it would be helpful if more reasons could be stated for setting up the committee, and if its could be defined.

Hove.

STANLEY KAYE.

*** The facts for which our correspondent asks will be found on p. 805.—ED. L

FOLIC ACID AND ITS CONJUGATES IN THE PATHOGENESIS OF MEGALOBLASTIC ANÆMIA

SIR,—In your issue of Oct. 15, Dr. Wilkinson and Dr. Israëls report hæmatological responses which occurred in patients with addisonian anæmia who were given a synthetic preparation of a naturally occurring pteroylglutamic-acid conjugate (teropterin). From the data obtained from this investigation they claim to have shown that "there is thus no reason for supposing that in pernicious anæmia there is a failure to release free folic acid from its conjugated forms." In addition they state that ". . . the newer evidence . . . seems to suggest that with present knowledge neither folic acid nor its conjugates play any major part in the ætiology of the human pernicious-anæmia syndrome." In view of the importance of these sweeping statements, if proved to be correct, it seems advisable to scrutinise closely the data on which they are based.

Treatment of 8 patients with addisonian pernicious anæmia with large doses of teropterin produced a satisfactory hæmopoietic response in each instance; 7 out of the 8 cases received this synthetic folic-acid conjugate in initial amounts of 80–140 mg. daily. The only conclusion which I submit can be drawn from this finding is that under the conditions of the experiment patients with pernicious anæmia can liberate sufficient free folic acid to produce a hæmopoietic response. The amount of free folic acid released is however not known, but it might be as small as 1 mg. per day, since I have shown that this amount can produce a hæmopoietic response comparable to those obtained by Wilkinson and Israëls with the large quantities of teropterin administered. Since no attempt was made by the authors to compare the ability of patients with pernicious anæmia and normal individuals to release folic acid from teropterin in the large quantities given (as could be done by assaying the excretion of folic acid in the urine in both groups), there is no justification for the deduction that the capacity of a patient with pernicious anæmia to utilise folic-acid conjugates is not impaired. There is in fact evidence that the reverse may well be the case. Thus the reports of Bethell, Swendseid, and others mentioned in Wilkinson and Israëls's paper clearly show that when concentrations of folic-acid conjugates prepared from natural sources are given to patients with pernicious anæmia in quantities more nearly approaching those present in the natural diet, and containing traces of natural conjugase inhibitors which prevent the cleavage of folic-acid conjugates, the hæmopoietic response may be absent or weak and inconstant. Such experiments much more nearly reflect the nutritional problem as it occurs under normal conditions in man. It is generally agreed that natural foods contain very small quantities of folic-

are usually indications of administrative sloth.
itle assistant is subject to the grossest abuses ; it
e read to connote anything. The layman would
that a consultant so described was not fully
d. in the pay of the other, and learning his job
him, whereas the very reverse might easily be the

It also allows one doctor to usurp legally from
lleague the right of access to patients, the right of
professional contacts, and the right of equal voice
mestic and other arrangements.

my opinion. attempts to create privilege such as
itlined above should be entirely discountenanced :
us differentiating titles should be dropped : and
ine should be allowed to progress realistically and
oniously.

REGIONAL CONSULTANT.

THE DISTINCTION AWARDS

—I have studied your leading article last week
interest and with the hope—soon killed—that I
find therein, what I have not been vouchsafed
y evasive critics, a reasoned answer to the objections
e voiced in another place. As I read it, you have
y provided further indications of the fallacy of this
ely grading affair. "There are bound to be
kes"; "the merit of doctors, like the merit of
and artists, is not always quite apparent"; and
, le mot juste, "rank is but the guinea stamp."
is precisely what a Government distinction issue
be, and no more.

vertheless your article in sweetly reasonable fashion
eds to the cliché that the "only convincing test is
ience." "Experience" is an impressive word.
he skilled experimenter knows what is and what is
ikely to be a good experiment. for he has thought
is problem beforehand and has so devised his experi-
that it shall yield him the most unequivocal answer
ble. What is to be said of this grading "experi-
"? The experimenters are an ad-hoc committee
n by that austere experimental genius the Minister
ealth, and not by any representative medical body
d in the field of inquiry. The procedure the com-
e have adopted gives no clue that they have sought
fine the quality that they are asked to grade, or
asked themselves if it be definable. The burden
ding in its vital preliminary stage has been passed
vast number of overlapping bodies, of diverse
ers and infinite variety, which are now proceeding
eir unwelcome task by whatever makeshift device
can think of. The only common item in method
to be a profound secrecy. Ballots and lists are
compiled and passed on with every juvenile device
stery to accountants and the like to boil down into
sort of coherence and then to pass on—still secretly
the Awards Committee. The potential gradee is
elf given an opportunity of dilating upon his merits
printed form, and without being a cynic one may
assume that he is as anxious not to let his colleagues
is homework, as they, when they compile their
reports, are to keep the results of their academic
rches from him.

e whole process is as chaotic as it is undignified.
everyone who participates in it is distressed at the
he has to play, and resents the circumstances which
placed him where he is in the matter. To call
n experiment is a travesty of words. and to expect
quitable or rational result is to be irresponsible.
hat can the general practitioner, in whose merits
ew masters are not interested, think when he sees
consultant thus tempted and thus responding to
ure of the pay warrant ?

nally, to turn to the undergraduate wisecrack with
h your article so fitly ends, I ask, who within the
ssion has ever judged the consultant by his
rial splendour or his chromium-plated chariot ? At most these exquisites, who loom so large in the minds of those who do not practise medicine, have never been more than a minute fraction of the consultant body, and if this "experiment" in grading can have nothing better to be said for it than that it will do away with standards which have never been taken seriously by us. then it stands already condemned, for it is as unnecessary as it is futile and unworthy of a learned profession.

London. W. 1. F. M. R. WALSHE.

** Our suggestion was that the Spens Committee's proposed system of paying specialists—by salary and distinction awards—should be tried for five years, "after which consultants as a body could themselves decide whether it be discontinued or altered." This can. we think, be fairly described as an experiment, in the *O.E.D.* sense of "a procedure adopted in uncertainty whether it will answer the purpose."—ED. L.

SIR,—Lord Melbourne remarked pleasantly that a singular distinction of the Order of the Garter was that there was no damned nonsense about merit in its award. Unhappily Lord Moran's committee can claim no immunity from the vulgar task of assessing the relative worth of candidates for distinction, and I am therefore encouraged to suggest to them a plan which may alleviate their embarrassment in becoming at once a fount of honour and distributors of pecuniary incentive.

The principal danger that besets them is that their attempt to assess consultants in order of merit may not merely entail injustice to individuals but lead to ill-feeling between them and stimulate log-rolling and self-advertisement among the less scrupulous. That. you will readily agree, would be disastrous.

As I see the position, the committee. when it comes to grips with the problem, will find that for the highest grade of award there will be a small number of candidates who deserve it beyond question by any sensible person. With them there is no difficulty. They should have it. But for the remainder of the awards in this group there will be numerous men whose distinction it is quite impossible to assess in any equitable order of merit for the reasons that Walshe has already published. that you. in your leading article, find so convincing, and that I, therefore. need not recapitulate.

My suggestion is that these awards should be determined by lot. Those whom fortune favoured would have the highest award and the remainder would automatically receive the award of the next grade. This process should be repeated for each of the groups. An Englishman will accept misfortune in a lottery with good grace and good humour, but he will resent deliberate classification in a grade inferior to that of a colleague as an injustice.

Do not regard this suggestion as frivolous. I believe that a ballot in the conditions I have outlined would reach as fair a result as the committee's longest and most earnest deliberations (for Walshe is right. I hold. except in respect of the few whose work is of unquestionable distinction). You will notice. of course, that the plan does not wholly surrender the distinction awards to blind chance : the judgment of the committee operates in the selection of the names to go into the hat and in the choice of those who are so outstanding that they are removed from the ballot.

The confusion and suspicion that already exist are evidence enough that the plan for a Central Awards Committee is unsatisfactory, and my suggestion is merely a temporary expedient to deal with an immediate and pressing difficulty. The Spens Committee presumably acted in the belief that a consultant at Much-Binding-in-the-Marsh might be the equal of a consultant at Guy's : in ninety-nine cases out of a hundred that has been false in the past and will remain so in future, but it must be admitted that men of promise have occasionally been excluded from competition for posts of distinction

NIPPLE-SHIELDS

SIR,—If one rubs a finger on a lead nipple-shield the skin is blackened; the removal of the black lead-stain with soap and water necessitates vigorous washing. Moreover milk which has been in contact with lead has been shown to contain lead. Hence wiping the nipples with a damp cloth before feeds certainly cannot be assumed to eliminate the danger of lead poisoning for a baby whose mother uses these shields; and vigorous scrubbing with soap and water five times a day would scarcely seem good treatment for a cracked nipple. Printed instructions that the shields should only be used, say, for a week might of course be issued; but who knows better than a doctor that instructions are not always read and that advice is not always followed? We have plenty of evidence that mothers find lead nipple-shields comfortable, which only increases the danger of their prolonged use. Surely the Ministry of Health is to be congratulated on taking steps to prevent the tragedy of a mother in this way unwittingly poisoning her infant with lead, and so, perhaps, causing death or mental defect. After all, there are other ways of treating cracked nipples.

Mr. Whitehead and I have read with much interest Dr. Kenwin Harris's letter last week on the dangers of some plastic materials. Is it not a fact that small articles, such as nipple-shields, can be manufactured from plastics containing no plasticiser nor any other toxic material? Can Dr. Harris—or the manufacturers—tell us whether the plastic shields now on the market are known to be non-toxic?

Queen Elizabeth Hospital for Children,
London, E.2.
I. GORDON.

SIR,—Dr. Kenwin Harris rightly warns in his letter last week that not all plastic materials could be considered suitable for nipple-shields. We wish to assure prescribers that the plastic material used in the manufacture of the 'Woolwich' breast-shield is 'Polystyrene' and is free from lead or other toxic substance.

Allen & Hanburys Ltd.,
London, E.2.
B. E. KENT
Public Relations Officer.

CONTROL OF TUBERCULOSIS

SIR,—Dr. Temple Clive writes, in his letter last week, as a sanatorium physician. Patients do not come under his care for treatment until perhaps one year after the diagnosis of tuberculosis; and his outlook must therefore be very different from that of the chest physician, who has to look after the patient at home during a wait of so many months.

It is right to "precondition" a patient by bed rest for 3–6 months, but not for one year. Collapse therapy at home makes the patient feel that something is being done and that he is not just being left to deteriorate. This has considerable effect on morale. Pneumoperitoneum, with or without phrenic crush, can produce excellent results at home, and has practically no complications. I would fully agree with Dr. Temple Clive that the "crash" pneumothorax without adequate bed rest beforehand is to be avoided. There comes a time, however, when a patient has been in bed for 3–4 months and has reached the right condition for the induction of a pneumothorax. To delay this for six months until the patient can be admitted to sanatorium may in a great many cases make a pneumothorax impossible, and the patient then has to have major surgical treatment. There will be failures and complications arising from the home-induced pneumothoraces, but such things are not unknown even in a sanatorium; at least, by attempting a pneumothorax on the right type of lesion at the right time, the chest physician may give the patient a chance to be back at work within 1–1½ years, instead of his needing extensive surgical treatment on admission to sanatorium and being off work 2–2½ years.

If the conditions laid down by Dr. Toussaint at recent British Tuberculosis Association meeting Liverpool, when he spoke about domiciliary therapy, are adhered to, there is no reason why a p should not progress as well at home as in a sana but the chest physician must have facilities for the term admission of patients for adhesion section, crush, &c. I fully agree with Dr. Temple Clive that short-circuit sanatorium treatment is wrong, but not, he says, "disastrous." The length of the waiting-list is disastrous, and any measure that the physician can take to make this smaller is to the b of everyone. Unfortunately Dr. Temple Clive does the patients whose disease is rendered quiescent by treatment before they are ever offered a bed in sanatorium.

With regard to streptomycin, it will not be possible most cases for this to be given at home, owing to frequency of the injections. Para-aminosalicyclic however, can be given at home; and as the bacillus apparently does not develop a resistance to drug, if a patient has the type of disease which benefit from it there seems to be no reason why it be withheld.

There is no reason why the sanatorium physic should be misled about a patient's progress before admission, whatever the previous treatment, if there is liaison and close coöperation between the sanatorium physician and the chest-clinic physician.

Greenwich Chest Clinic,
London, S.E.10.
C. W. L. JEANES
Chest Physician

SPURIOUS TITLES

SIR,—We earnestly hope that no consultant of full specialist status would agree to employment not in accord with that status. In the clinical field this can have but one meaning—the fullest clinical freedom, full individual responsibility for the care of the patient, and direct relationship between the consultant and the patient's medical advisors, relatives, and friends.

It is therefore with some misgiving that we notice the gradual intrusion of more and more heads, chiefs, directors, and organisers; and more recently advertisements have appeared, inviting more than one consultant to serve a group, area, team, unit, or collection of clinical material or beds, in which we find references to such terms as senior and assistant, bracketed in small letters, apologetically following the title of the consultant. There is no mention of these distinctions in the Act, and if they are to be given a cash value this should be openly stated. The value might really be in undisclosed kind.

This sort of jobbing is distasteful to all but the inefficient, and never in the past has a consultant reached the age at which it is now possible to reach the grade under consideration and still had to look behind him. This is unnecessarily cruel, for these heights are the most vertiginous. Let us hope that this is not really the state of affairs now.

The length of a doctor's professional life as a consultant will be less than 30 years on the average. Let us conside the position if grouping into two, for example, is allowed to take place. Assuming equal ability, the higher consultant should be at least 15 years ahead of the lower. Assuming greater ability, it will take some years for this to become evident and also generally accepted. It seems therefore that if such undesirable and unreal distinctions are allowed to be perpetuated there should be at least 15 years between the consultants, except where undoubted and generally accepted greater ability exists.

The titles of head, chief, director, and organiser are distasteful, if not comical, to the great majority of doctors, and are entirely superfluous. The claim that they administratively economical is the reverse of the fact.

of that night." which he later described with -teristic self-effacement in our Peripatetic columns ii, 625).

ides his appointment at St. Thomas's, Cassidy hysician to the Lord Mayor Treloar Cripples' tal at Alton, the King Edward VII Sanatorium at ırst, and the Children's Heart Hospital at West ıam. For many years he was physician and chief al officer to the Metropolitan Police. In 1913 s elected fellow of the Royal College of Physicians ndon. *The following year he was Goulstonian* er; he later held office as senior censor, and in s Harveian orator. He was also a former president Royal Society of Medicine and of the Cardiac y. He had examined for the universities of Cam-, London, Edinburgh, and Manchester, and for the int Board.

1929 Cassidy was appointed C.B., and the following he became physician to H.M. Household. Two later he received the appointment of physician ng George V, a position which he also held in the of Edward VIII and George VI. After His Majesty's, earlier this year Sir Maurice, who had been nted K.C.V.O. in 1934, was promoted G.C.V.O. ppily, he was injured in a motor accident (in which Cassidy was *also* hurt) and he never *fully* recovered his severe injuries. On Oct. 10 the King visited t his London home to confer on him his new honour.

olleague adds: "It might have been thought from tionality that Cassidy would be genial, but I think re appropriate word is kindly; and yet it is no eration to say that his patients loved him. Some e found him difficult to approach and perhaps austere, but those of us who worked as his juniors house-officers realised how much interest he took eir careers and how helpful he was in the back-d. In our profession a man's success is not estimated ly by the honours he receives but rather by the way consulted by his colleagues, and I know that a proportion of Cassidy's earning time was spent in ing doctors *and their families about* their health. is final illness, which was not due to his accident, owed outstanding courage."

his home life C. M. P. writes: "Except when on tion Maurice Cassidy immersed himself in his ssional life to an exceptional degree, often enough ing seven days in the week. His holidays were care-planned and usually took him far north for fishing eer-stalking. He was then the most delightful anion, capable of remarkable endurance on river ll, cheerful under the most adverse conditions, and d with a happy faculty of seeing the humorous side itty failures and discomforts. He was indeed a good panion as well as a great physician. His married vas a happy one; Lady Cassidy coöperated to the in all his activities, and in their charming home ed herself an ideal hostess.

Cassidy was not attracted by the power and prestige h may derive from high office, nor did he take an e part in what may be termed medical politics, ough his wide contacts and broad sympathies would qualified him for those spheres. In general it was nterest in and devotion to his patients, of all ranks, dominated his professional life. Though he was ly 70 at the time of his death, till his accident had been in full career and seemed in excellent th and there were many who still relied on the help advice he gave so freely and generously."

r Maurice Cassidy married in 1918 Miss Elsie Relfe. re were no children of the marriage.

ROBERT SEVESTRE

M.A., M.D. CAMB.

r. Sevestre, consulting physician to the Royal ester Infirmary, died at his home in Leicester on . 13, at the age of 81.

orn in Calcutta, of Huguenot stock, he was brought England in childhood, and was educated at Rugby ool, Cambridge, and St. Bartholomew's Hospital. qualified in 1893, and some five years later was ointed assistant physician to Leicester Royal Infirm-, later becoming full physician. During the 1914–18 war he served in France in the R.A.M.C., with the rank of major, and was physician to a general hospital. On his return to this country he was on the staff of the 5th Northern General Hospital, Leicester. He was the joint author of the chapter on wounds of the chest in the *Manual of War Surgery*.

Dr. Sevestre held many offices as a citizen of Leicester. In 1929 he was appointed a justice of the peace, and he was also a governor of the Wyggeston Hospital, chairman of the pensions committee, and a trustee of Simons Charity. R. McD. C. writes: "Though of a quiet and retiring disposition, Dr. Sevestre was widely known and highly thought of in the city to which he devoted a full life of medical service. By his passing, a link with the previous generation of physicians has been severed. His work at the Royal Infirmary, to which he unselfishly devoted himself for so long a period, earned for him the gratitude of countless patients."

Mrs. Sevestre died in 1937, and their only son was killed in an accident while serving in the Far East in 1943.

JAMES KYLE

M.R.C.S.

Air Commodore James Kyle, who died on Oct. 8 at the age of 60, was educated at Shrewsbury and Guy's Hospital. A keen Territorial as a student, he was adjutant of the Artist Rifles at the outbreak of the first world war. Although he was in his final year, he insisted on accompanying the battalion to France, serving there until 1916, when he returned to Guy's to qualify in 1918.

After a term as assistant medical officer at Lambeth Hospital, he entered the medical branch of the Royal Air Force in 1919. "Here," writes a colleague, "his military experience and flair for administration proved of great value during the growing pains of a new service, and lucky was the P.M.O. who had Jimmy to lean on; his wise counsel, tempered with humanity and abundant common sense, made him a fine medical staff officer. Later he proved an ideal commandant of the medical training depot: the thousands of medical officers and orderlies who passed through it found in him a wise counsellor and a friend in need. He was a keen shot, and his trim soldierly figure with a gun under his arm and his Labrador bitch at his heels was a familiar sight amidst the wooded Chiltern hills he loved so well. A coronary thrombosis in 1938 curtailed his activities; tournament tennis was, alas, a thing of the past, but he still was able to enjoy a day with the rod or the gun." He remained commandant of the medical training depot throughout the late war. After retiring from the R.A.F. in 1945 he became assistant director of medical services of the British Overseas Airways Corporation, and worked under his old chiefs, Air Vice-Marshal Sir William Tyrrell and, later, Air Marshal Sir Harold Whittingham. He served on the council of the British Medical Association as a Service representative.

He leaves a wife and two daughters.

Births, Marriages, and Deaths

BIRTHS

ARNOLD.—On Oct. 22, in London, the wife of Dr. M. E. Arnold—a daughter.

FERGUSON.—On Oct. 17, the wife of Dr. G. R. Ferguson—a daughter.

FRASER.—On Oct. 17, at North Bovey, Devon, the wife of Dr. D. B. Fraser—a daughter.

HUSDAN.—On Oct. 18, the wife of Dr. L. L. Husdan—a daughter.

MILLER.—On Oct. 18, at Kisumu, Kenya, the wife of Mr. Roy Miller, F.R.C.S.—a daughter.

SPEIRS.—On Oct. 13, at Nairobi, Kenya, the wife of Dr. R. C. Speirs—a daughter.

THOMSON.—On Oct. 10, in Singapore, the wife of Surgeon Lieut.-Commander M. L. Thomson, R.N.—a daughter.

MARRIAGES

PEARSE-WILLIAMS—WRIGHT.—On Oct. 15, at Epsom, Thomas Pearse-Williams, F.R.C.P., to Joyce Christina Wright.

THOMSON—HOBART.—On Oct. 22, at Sutton, Surrey, Douglas D. C. Thomson, M.R.C.S., to Elaine Hobart.

DEATHS

CASSIDY.—On Oct. 22, in London, Maurice Alan Cassidy, G.C.V.O., C.B., M.A., M.D. Camb., F.R.C.P.

MORITZ.—On Oct. 18, Arnold Moritz, B.A., M.B. Camb.

PALMER.—On Oct. 19, at Torquay, Sydney Joseph Palmer, M.B.E., M.D. Durh.

ROPER.—On Oct. 17, at Rochester, Charles Roper, B.A., M.D. Camb., D.P.H., aged 71.

by reason of poverty or other domestic or personal ties. Adequate remuneration of registrars and consultants now throws the gates wide open everywhere and the whole position is changed. In future, posts (not individuals) should be graded for distinction, and, with as little delay as possible, a suitable authority should be established to determine their status and distribution between hospitals and relieve the Awards Committee of its impossible and unpleasant work.

Birmingham. A. P. THOMSON.

VENTRICULAR FIBRILLATION

SIR,—The electrocardiogram published by Dr. Priest (Oct. 15) shows no convincing evidence of ventricular fibrillation. The record is reproduced in small size, but it seems apparent from it that the condition Dr. Priest has recorded is paroxysmal ventricular tachycardia, for one definite feature is the absolute regularity of the aberrant complexes; in ventricular fibrillation there is always quite marked irregularity. Paroxysmal ventricular tachycardia is not uncommon early in cardiac infarction. I have myself seen several such cases, some proceeding to complete recovery.

London, W.1. DOUGLAS ROBERTSON.

THE REGISTRAR

SIR,—I wish to endorse very strongly the point made last week by "Senior Registrar." I, too, am in that grade and the same problem has concerned me for some time. At my request, the point was raised some months ago before the Central Consultants and Specialists Committee of the B.M.A. The figures then given were that the ratio of consultants to senior registrars to registrars to junior registrars should be 30 to 4 to 2 to 1, not allowing for wastage. These figures were, of course, based on the time for which the post is expected to be held. More recently I have been told that the actuarial expectation of service for a consultant is only 25 years. The wastage factor is very difficult to assess, but, in the interests of economy and fairness, I think that at least two-thirds of those appointed to senior-registrar posts should be able to expect consultant posts. The wastage of registrars and junior registrars will probably be considerably greater. On the basis of these figures the ratio of consultants to senior registrars should be 25 to 6, or, roughly, 4 to 1. I should be interested to hear of any region in which this ratio is attained.

It may interest registrars to know that in at least one region the difficulties and unfairness of the present position are fully appreciated by the secretary and the consultant staff of the teaching hospital. In that hospital steps are being taken to see that the number of registrars in training at any one time is not much greater than the number for which the region will be able to find consultant posts. To this end, the establishment of consultants in the teaching hospital has been increased while that of registrars has been diminished. Is it too much to hope that the staffs of other teaching hospitals and the establishment committees of the regional hospital boards will follow this example?

ANOTHER SENIOR REGISTRAR.

CORRECTION OF MEDICAL REGISTER

The Registrar of the General Medical Council writes:

"I am desired by the Returning Officer to say that voting papers for the purpose of the forthcoming election of one member of the General Medical Council to represent the registered medical practitioners resident in England will be issued on Oct. 25 to all

in England; and tha

be glad if any such practitioner who has not received a voting paper would communicate immediately with the office of the Council (44, Hallam Street, London, W.1), whether or not he proposes to vote in the election, in order to ascertain that his address is correctly entered in the Medical Register."

Obituary

MAURICE ALAN CASSIDY

G.C.V.O., C.B., M.A., M.D. Camb., F.R.C.P.

Sir Maurice Cassidy, physician to the King and ing physician to St. Thomas's Hospital, died at his in London on Oct. 22.

Born on Feb. 29, 1880, he was the son of Dr. Cassidy, C.B.E., who for fifty years was supe of Lancaster Mental Hospital. He received his education in Lancaster and then went up to College, Cambridge, where he took a first-cl both parts of the natural sciences tripos. In qualified from St. Thomas's Hospital, and during next five years he held resident appointments there, including those of medical registrar and demonstrator in physiology. In 1911 he was appointed physician to outpatients, with charge of the electrocardiographic department. While still a house-physician he had held the Salter research fellowship, and he held it again in the two years following his appointment to the staff. Before he joined the staff of St. Thomas's he had the choice of returning to Cambridge, for Clare College had offered him a fellowship. His association with his old college was happily renewed when a few months ago he was elected to an honorary fellowship there.

In the first world war Cassidy served during the early years as physician at No. 2 Anglo-Belgian hospital at Calais, but in 1916 he was invalided home pulmonary tuberculosis, and it was two years before was able to return to work. Later he himself ackno ledged how much his experience as a patient had him as a doctor. L. B. C. writes: "For me Cas was an outstanding physician, not because of his profo knowledge of medicine but because he seemed to k instinctively what each patient needed. He was ne carried away by fads and fancies, or by the mechan of modern medicine. His kindliness, charm, and c mon sense gave confidence to the most diverse peo After a consultation his patients came away impr by him as a man and satisfied that he had done utmost for them. Although cardiology became more more his main interest, he never ceased to be fu mentally a general physician, and in this he excell He represented all that was best in consulting medici To his juniors he was so friendly and unassuming th they forgot his distinction in the pleasure of talk to him. He stood out among his fellows not because any single achievement but for general poise and balan modesty, and humanity. Such men are rare."

Although he had an extensive consultant practi his work at St. Thomas's always came first, and he wo never cut his rounds. A first-rate teacher, he insis that his beds should have a large proportion of no cardiological cases, and his bedside instruction conce trated on the principles of medicine and on the essentials treatment. He kept himself up to date by wide readin and he had the gift of extracting from the literature the things that really matter. As a committee man he was admittedly not at his best, for "he was able to see both sides of a question, and so he was not always decisive in his final opinion." After his nominal retire ment in 1930 he volunteered to come back to St. Thomas's and during the whole of the war years he set an to the younger members of the staff by the way always turned up to rounds even when they entailed journey of forty miles into the country. During blitz he took his share of night duty at the hospit he soon arrived when the major damage was done to building and was "extraordinarily helpful in the th-east Scotland and Northumberland. Northern Ireland it of the question because of war-time difficulties in ort. The harvesters had to be taught to identify the which are polymorphic. This field work proceeded r side with an extensive laboratory study of the botany omy, anatomy, and ecology) of the weeds, and with al experiments in the production of agar. The whole which is also part of the wonderful story of penicillin. t fascinating and bears out once more the old adage necessity being the mother of invention.

G.M.C. ELECTION

RE is a vacancy on the General Medical Council for a representative of the medical profession in England. llowing have offered themselves as candidates :

. BRYCE, M.B. Birm., who is in practice in Birmingham.

. CARTER, M.B. Lond., of Bournemouth, whose candidature rsed by the divisions of the B.M.A. in England and Wales.

EON GILLIS, M.B.E., M.CH. ORTH., F.R.C.S.E., of Worcester Park, who is senior surgeon to Queen Mary's Hospital, npton.

closing date of the receipt of voting papers is Nov. 3.

REFERENCE MADE EASY

nost scientific and technical fields workers are resigned nding long hours in hunts through a disconcertingly nass of articles. This lost time can, it seems, be saved new machine, lately demonstrated by the Department nmerce and Agriculture in Washington, which completes nutes the work of many days. With this machine, has been named the 'Microfilm Rapid Selector,'[1] lation about each item is recorded on standard 35 mm. atographic film ; and a code-pattern, predetermined e subject, is simultaneously printed on each frame. ontents of about 500,000 ordinary-sized library cards e recorded on 1000 feet of film. The film, with its atterns, is scanned photo-electrically at the rate of than 60,000 frames a minute, and by means of a reen in front of the photo-cells a camera can be operated atically to make prints of all frames bearing information a chosen subject. At least for a year or two this ne should meet all demands, for the maximum number ferent code-patterns is about 10 million. One possible ould be for analysing "pooled" case-records ; the nes at present used for this purpose are extremely

ACADEMICIAN IVAN PAVLOV

EW biographical film, lasting $1^1/_2$ hours, gives a review great scientist's life and work. It shows Pavlov's early life, he, the doctor, and not his father, the priest, is asked to dying man. Pavlov tells him that there is no after-life, he dying man reacts by having the whole orchard of bearing trees cut down so that no-one shall enjoy them he has gone.

vlov's early work on digestion leads on to studies of the control of salivation and so to conditioned reflexes. cision to concentrate on the mechanism of the brain es criticism because he is attempting to cross the lden frontier between body and the soul. He goes to ridge and in a charming scene receives from the Vice-cellor an honorary doctorate, the ceremony being rupted by the undergraduates lowering a toy dog over ead. When the October Revolution comes, Pavlov es an invitation to go to America to work. The eviks support his work even when conditions are at their difficult. Pavlov has some doubts at first, but becomes inced of the great future that lies before the Socialist . In a visit to New York he states in a lecture that the ges produced in animals by conditioning may be passed o succeeding generations. At the International Physio-al Congress in Leningrad he speaks of the part the sian people will have in working for world peace.

his entertaining and well-acted film is designed for general ences, and its producers are to be congratulated on not g afraid to convey scientific information. (English and erican film-makers have a fear, probably quite misplaced, oring the public with facts.) To the specialist audiences are, unfortunately, the only people in this country y to see it, it will give an impression of being rather lly propagandist of the doctrines fashionable in 1949, ugh there is much of value besides.

The production is by G. Kazansky and the part of Pavlov is played by A. Borisov. The film is made by Lenfilm. A 35 mm. copy is held in this country by the Soviet Film Agency at the Russian Embassy.

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[1] *Radio-Electronics*, 1949, 20, 8.

University of Oxford

On Oct. 13 the following degrees were conferred :

B.M.—Nina A. Cohen,* E. A. D. W. Simpson, R. W. Torrance, J. G. Widdicombe.

* In absentia.

University of Cambridge

On Oct. 15 the following degrees were conferred :

M.B., B.Chir.—Peter Bryan-Brown,* W. G. Dawson,* Alexander Gol,* J. R. Harris,* H. P. Kilner,* Joshua Lynfield,* Elisabeth Monkhouse, S. T. H. H. Pilbeam,* K. N. J. Pocock.

* By proxy.

University of Sheffield

Dr. J. K. A. Beverley has been appointed lecturer in bacteriology ; Dr. G. M. Wilson, research fellow and tutor in therapeutics ; Dr. M. G. Philpott, full-time tutor in child health ; and Dr. P. A. King, Dr. H. Debovitch, and Dr. A. A. Belton, demonstrators in anatomy.

University of Leeds

Dr. Jean Tattersall has been appointed assistant medical officer to the university.

The annual dinner of past and present students of the school of medicine will be held at the Great Northern Hotel, Leeds, on Friday, Nov. 25, at 7.30 P.M., when Prof. J. W. McLeod, F.R.S., will preside. Prof. H. S. Raper, F.R.S., will be the guest of honour. Tickets may be had from the honorary secretary at the Medical School, Leeds.

Royal College of Physicians of London

Dr. J. G. Scadding will deliver the Bradshaw lecture on Thursday, Nov. 10, at 5 P.M. at the college, Pall Mall East, S.W.1. He is to speak on Sarcoidosis, with special reference to the Lung Changes.

Royal College of Physicians of Ireland

On Oct. 18 the following officers were elected : president, Dr. Leonard Abrahamson ; vice-president, Dr. P. T. O'Farrell ; censors, Dr. E. B. McEntee, Dr. J. Duffy, and Dr. J. G. Gallagher.

Royal College of Surgeons of Edinburgh

At a meeting of the college held on Oct. 19, the following office-bearers were elected for the ensuing year : president, Mr. W. Quarry Wood ; vice-president, Mr. Frank Jardine ; secretary and treasurer, Mr. J. J. Mason Brown ; councillors, Prof. R. C. Alexander, Mr. William Anderson, Mr. K. Paterson Brown, Mr. John Bruce, Dr. W. F. Theodore Haultain, Prof. C. F. W. Illingworth, Mr. J. S. Jeffrey. Sir James Learmonth, Dr. G. Ewart Martin, Prof. Walter Mercer, Mr. G. J. Stevenson, Mr. R. L. Stewart ; representative on the General Medical Council, Sir Henry Wade ; conservator of museum, Mr. J. N. J. Hartley ; convener of museum committee, Mr. John Bruce ; librarian, Dr. Douglas Guthrie.

The following were admitted to the fellowship :

S. J. Barr, Abd El Hamid Bayoumi, C. F. A. Cummins, G. A. Fraser, Sankaran Govindan, Nar Narain Singh Grewal, K. S. Jones, Thomas Lawrie, H. A. Maslowski, M. L. Mason, William Matthews, J. F. O. Mitchell, C. M. C. Potter, Walter Recht, Courteney Remington-Hobbs, T. A. Sale, Abdel Meguid Shohdy, M. J. Smyth, Andrew Tomney, T. M. Welsh, I. W. Winchester, Simon Witt.

Royal College of Obstetricians and Gynæcologists

Postgraduate courses for those studying the special practice of obstetrics and gynæcology will be held at the college, 58, Queen Anne Street, London, W.1, on Nov. 4 and 5, and on Nov. 18 and 19.

Institute of Laryngology and Otology

On Friday, Nov. 18, at 4.30 P.M., Prof. Geoffrey Jefferson, F.R.S., will deliver the annual address at the institute, 330, Gray's Inn Road, London, W.C.1. He is to speak on the Acoustic Neuromas.

British Psycho-Analytical Society

On Wednesday, Nov. 30, at 8 P.M., at 1, Wimpole Street, London, W.1, Prof. Arnold Toynbee, LITT.D., will speak to this society on Poetical Truth and Scientific Truth in the Light of History.

Notes and News

PAYMENT OF REGISTRARS IN TEACHING HOSPITALS

We have already referred[1] to criticism of the arrangement by which registrars in teaching hospitals are "appointed and paid by boards of governors." Representations have been made to the Minister of Health that certain medical schools would prefer to contribute to the salaries of registrars employed in teaching hospitals. This matter has been discussed with the University Grants Committee, who have confirmed the following resolution by their medical advisory committee: "That the committee do not regard it as generally essential, on educational grounds, that universities should contribute to the salaries of registrars employed in teaching hospitals. They would, however, consider it appropriate that any university which desired to make such a contribution up to 50% of the registrars' salaries should be permitted to do so if their financial circumstances allow."

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AGAR

Agar is an unrivalled medium for growing bacteri moulds; without it the war-time production of pen would have been much hampered. It is also used in med as petroleum-agar, to promote peristalsis, without che irritation of the bowel, by resisting digestion, attracting to itself, and swelling to several times its original bulk. used in the preparation of food by Asiatics, to add bulk special diets of diabetics, and in the canning industry prevent the acids of fruit juices from attacking the It is used in the manufacture of soaps, cosmetics, marine storage-batteries, textiles, leather, electric plywood, films, nicotine sprays, paper, &c.; and in diverse industries as electroplating and agriculture. 1939 agar was imported from Japan, where for had been prepared from red seaweed; and when war out it became imperative to produce agar in this co to find a substitute for it. The requisite research results are described fully in a new book.[2] Germany, same quandary as ourselves, apparently did no re obtain new supplies of agar but, to keep existing sto salvaged used agar.

Red seaweed grows in shallow water near low spring tides, or a little deeper, and consequently harvested only on limited occasions and by people acc to boatwork. When war broke out the researchers discover the habitats of red seaweeds off our co Ireland at least two kinds of red seaweed have long used to produce "Carrageen moss," which makes, with a greyish-white blancmange with a delicate flavour a firm reputation as a "food" for invalids. That was all we know about red seaweeds in this country in Otherwise we started from scratch, and had first of all to their habitats and test which of them could be u making agar. Naturally the two species used for Carrageen moss were tried first, and they proved Next we had to find out the best seasons for harvesting mapping included the discovery of whether the reg seaweeds were accessible to the harvesters or not. M the areas were found off our west coast, but a few were

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[2] A Study of Certain British Seaweeds and their Utilisat Preparation of Agar. By S. M. Marshall, L. Newton, A. P. Orr. H.M. Stationery Office. 1949. Pp. 184.

h-east Scotland and Northumberland. Northern Ireland it of the question because of war-time difficulties in ort. The harvesters had to be taught to identify the which are polymorphic. This field work proceeded side with an extensive laboratory study of the botany omy, anatomy, and ecology) of the weeds, and with al experiments in the production of agar. The whole which is also part of the wonderful story of penicillin. t fascinating and bears out once more the old adage necessity being the mother of invention.

G.M.C. ELECTION

RE is a vacancy on the General Medical Council for a representative of the medical profession in England. llowing have offered themselves as candidates :

. BRYCE, M.B. Birm., who is in practice in Birmingham.

. CARTER, M.B. Lond., of Bournemouth, whose candidature sed by the divisions of the B.M.A. in England and Wales.

EON GILLIS, M.B.E., M.CH. ORTH., F.R.C.S.E., of Worcester Park, who is senior surgeon to Queen Mary's Hospital, npton.

closing date of the receipt of voting papers is Nov. 3.

REFERENCE MADE EASY

nost scientific and technical fields workers are resigned nding long hours in hunts through a disconcertingly nass of articles. This lost time can, it seems, be saved new machine, lately demonstrated by the Department merce and Agriculture in Washington, which completes nutes the work of many days. With this machine, has been named the 'Microfilm Rapid Selector,'[1] ation about each item is recorded on standard 35 mm. tographic film ; and a code-pattern, predetermined e subject, is simultaneously printed on each frame. ontents of about 500,000 ordinary-sized library cards e recorded on 1000 feet of film. The film, with its atterns, is scanned photo-electrically at the rate of than 60,000 frames a minute, and by means of a reen in front of the photo-cells a camera can be operated atically to make prints of all frames bearing information a chosen subject. At least for a year or two this ne should meet all demands, for the maximum number erent code-patterns is about 10 million. One possible ould be for analysing "pooled" case-records ; the nes at present used for this purpose are extremely

ACADEMICIAN IVAN PAVLOV

EW biographical film, lasting $1^1/_2$ hours, gives a review great scientist's life and work. It shows Pavlov's early life. he, the doctor, and not his father, the priest, is asked to dying man. Pavlov tells him that there is no after-life. he dying man reacts by having the whole orchard of earing trees cut down so that no-one shall enjoy them he has gone.

lov's early work on digestion leads on to studies of the control of salivation and so to conditioned reflexes. ision to concentrate on the mechanism of the brain s criticism because he is attempting to cross the den frontier between body and the soul. He goes to ridge and in a charming scene receives from the Vice-ellor an honorary doctorate, the ceremony being upted by the undergraduates lowering a toy dog over ead. When the October Revolution comes, Pavlov s an invitation to go to America to work. The eviks support his work even when conditions are at their difficult. Pavlov has some doubts at first, but becomes nced of the great future that lies before the Socialist . In a visit to New York he states in a lecture that the ges produced in animals by conditioning may be passed succeeding generations. At the International Physio-l Congress in Leningrad he speaks of the part the ian people will have in working for world peace.

is entertaining and well-acted film is designed for general nces, and its producers are to be congratulated on not afraid to convey scientific information. (English and rican film-makers have a fear, probably quite misplaced, ring the public with facts.) To the specialist audiences are, unfortunately, the only people in this country to see it, it will give an impression of being rather ly propagandist of the doctrines fashionable in 1949, gh there is much of value besides.

The production is by G. Kazansky and the part of Pavlov is played by A. Borisov. The film is made by Lenfilm. A 35 mm. copy is held in this country by the Soviet Film Agency at the Russian Embassy.

University of Oxford

On Oct. 13 the following degrees were conferred :

B.M.—Nina A. Cohen,* E. A. D. W. Simpson, R. W. Terrance, J. G. Widdicombe.

* In absentia.

University of Cambridge

On Oct. 15 the following degrees were conferred :

M.B., B.Chir.—Peter Bryan-Brown,* W. G. Dawson,* Alexander Gol,* J. R. Harris,* H. P. Kilner,* Joshua Lynfield,* Elisabeth Monkhouse, S. T. H. H. Pilbeam,* K. N. J. Pocock.

* By proxy.

University of Sheffield

Dr. J. K. A. Beverley has been appointed lecturer in bacteriology ; Dr. G. M. Wilson, research fellow and tutor in therapeutics ; Dr. M. G. Philpott, full-time tutor in child health ; and Dr. P. A. King, Dr. H. Debovitch, and Dr. A. A. Belton, demonstrators in anatomy.

University of Leeds

Dr. Jean Tattersall has been appointed assistant medical officer to the university.

The annual dinner of past and present students of the school of medicine will be held at the Great Northern Hotel, Leeds, on Friday, Nov. 25, at 7.30 P.M., when Prof. J. W. McLeod, F.R.S., will preside. Prof. H. S. Raper, F.R.S., will be the guest of honour. Tickets may be had from the honorary secretary at the Medical School, Leeds.

Royal College of Physicians of London

Dr. J. G. Scadding will deliver the Bradshaw lecture on Thursday, Nov. 10, at 5 P.M. at the college, Pall Mall East, S.W.1. He is to speak on Sarcoidosis, with special reference to the Lung Changes.

Royal College of Physicians of Ireland

On Oct. 18 the following officers were elected : president, Dr. Leonard Abrahamson ; vice-president, Dr. P. T. O'Farrell ; censors, Dr. E. B. McEntee, Dr. J. Duffy, and Dr. J. G. Gallagher.

Royal College of Surgeons of Edinburgh

At a meeting of the college held on Oct. 19, the following office-bearers were elected for the ensuing year : president, Mr. W. Quarry Wood ; vice-president, Mr. Frank Jardine ; secretary and treasurer, Mr. J. J. Mason Brown ; councillors, Prof. R. C. Alexander, Mr. William Anderson, Mr. K. Paterson Brown, Mr. John Bruce, Dr. W. F. Theodore Haultain, Prof. C. F. W. Illingworth, Mr. J. S. Jeffrey, Sir James Learmonth, Dr. G. Ewart Martin, Prof. Walter Mercer, Mr. G. J. Stevenson, Mr. R. L. Stewart ; representative on the General Medical Council, Sir Henry Wade ; conservator of museum, Mr. J. N. J. Hartley ; convener of museum committee, Mr. John Bruce ; librarian, Dr. Douglas Guthrie.

The following were admitted to the fellowship :

S. J. Barr, Abd El Hamid Bayoumi, C. F. A. Cummins, G. A. Fraser, Sankaran Govindan, Nar Narain Singh Grewal, K. S. Jones, Thomas Lawrie, H. A. Maslowski, M. L. Mason, William Matthews, J. F. O. Mitchell, C. M. C. Potter, Walter Recht, Courteney Remington-Hobbs, T. A. Sale, Abdel Meguid Shohdy, M. J. Smyth, Andrew Tomney, T. M. Welsh, I. W. Winchester, Simon Witt.

Royal College of Obstetricians and Gynæcologists

Postgraduate courses for those studying the special practice of obstetrics and gynæcology will be held at the college, 58, Queen Anne Street, London, W.1, on Nov. 4 and 5, and on Nov. 18 and 19.

Institute of Laryngology and Otology

On Friday, Nov. 18, at 4.30 P.M., Prof. Geoffrey Jefferson, F.R.S., will deliver the annual address at the institute, 330, Gray's Inn Road, London, W.C.1. He is to speak on the Acoustic Neuromas.

British Psycho-Analytical Society

On Wednesday, Nov. 30, at 8 P.M., at 1, Wimpole Street, London, W.1, Prof. Arnold Toynbee, LITT.D., will speak to this society on Poetical Truth and Scientific Truth in the Light of History.

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[1] *Radio-Electronics*, 1949, 20, 8.

Notes and News

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HE SIGNIFICANCE OF FUNCTIONAL DIFFERENTIATION IN MAMMARY TUMOURS *

B. D. PULLINGER
M.D. Lond.

s as an interpreter of pathological structure that to honour Kettle's memory today. His teaching ork were never limited to the descriptive field. ys ask yourself," he used to say, "where has come from, why and how, and where is it going The only logical outcome of this attitude, which ded the observational phase of pathology of a generation, was to explore disease processes mentally. It was Kettle's great regret that the stances of his life and day prevented the devotion whole time to experimental pathology. Were he ng man now, the obstructions and lack of oppor- would be little less; yet it is clear that to advance nowledge of pathology we shall have to adopt mental methods, desert our pigeon-holes, and nise with the basic sciences as he did in the short nd span of life allowed him.

s therefore fitting to recall Kettle's teaching with ount of what may be learnt from an experimental of functional differentiation in the mammary and its tumours.

INFLUENCING DIFFERENTIATION

ad never given the origin of differentiation in urs very much thought. As a diagnostic aid, enabling o name a primary growth, it is of course invaluable. nd that I was content to accept the fact of functional entiation in tumour cells as an inherent potentiality, gh not always realised, of the diseased as it is of al cells. I must add that this superficial attitude is t all general among pathologists: others with whom e discussed the matter have anticipated some of the sions reached by experiment, on the basis of evelopmental work on amphibia.

the course of some inquiries into the local conditions ring the incidence of hereditary mammary tumours ice, the need arose to vary the degree of functional differentiation at will. This led to a quantitative study of differentiation in the period around puberty.

The mammary gland is one of the few mammalian organs which are still rudimentary at birth, so that, if one knows how to arrest its normal growth and then to continue it by artificial means, one may study development both qualitatively and quantitatively. It is known that the gland will fail to evolve if ovarian hormones are withheld, as by excision of the ovaries, until sometimes in compensation after a considerable lapse of time in the mouse, œstrogen may again be elaborated in the suprarenals. Œstrogens, whether naturally occurring or artificially applied to most spayed mice, cause only outgrowth and branching of the mammary ducts. Progesterone, in combination with œstrogens, but not alone, induces lobular-alveolar or acinar differentiation. There exists a tacit assumption that dosage and response to these hormones are probably related quantitatively because response is so greatly increased with rise in hormone output in pregnancy.

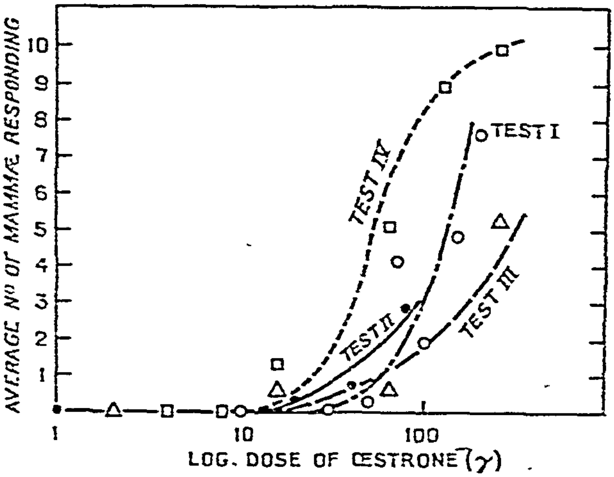
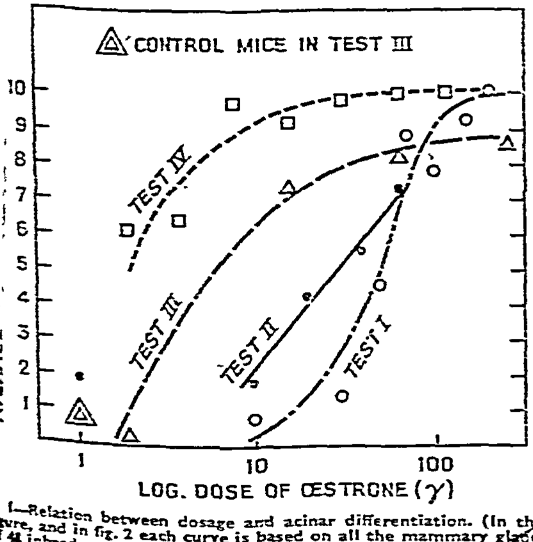


Fig. 2—Relation between dosage and secretion.

A few not very successful attempts have been made to define this quantitative relationship. A satisfactory solution is complicated by the need to measure simultaneously the effect of two substances, one a primary stimulator, the other a synergist. Previously stock mice, whose reactivity was probably far from homogeneous, were the test animals (Mixner and Turner 1943). Attempts may be simplified by using certain inbred strains of mice whose mammæ respond to œstrogen alone with duct outgrowth, acinar differentiation, and secretion. Using mice from an œstrogen-sensitive inbred strain of this kind (Pullinger 1947) I was able, with the indispensable help of my former colleague, Dr. C. C. Spicer, to prove on a statistical basis that a quantitative relationship exists between dosage and response. The precise relationship has been variable from one assay to another, revealing a changing sensitivity, the source of which has not been determined. There remain also practical and theoretical difficulties in such an assay. Nevertheless there is little doubt, as will be seen from figs. 1 and 2, that a true quantitative response exists between dosage and acinar differentiation and between dosage and secretion. A response by secretion in 50% of mammæ was not obtained in any one of the four assays with less than 10 γ œstrone.

MAMMARY STIMULANTS

So far as is known, the mammary gland grows and develops in response to comparatively few stimuli. If the



1—Relation between dosage and acinar differentiation. (In this ure, and in fig. 2 each curve is based on all the mammary glands f 44 inbred pure-line spayed virgin female mice.)

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ttle memorial lecture delivered on Oct. 7 in London.

Guild of Hospital Librarians

A conference on the Hospital Librarian in the Children's Ward is to be held at Chaucer House, Malet Place, W.C.1, on Wednesday, Nov. 9, at 2.30 P.M.

Victor Horsley Lecture

On Thursday, Dec. 8, at 5 P.M., at University College Hospital Medical School, London, W.C.1, Sir Hugh Cairns will deliver the Victor Horsley lecture. He is to speak on Disturbances of Consciousness with Disorders of the Brain Stem.

The Scientific Film Association

A symposium on Problems in Making Psychological Films will be held at the Wellcome *Foundation Institute*, 183, Euston Road, London, N.W.1, on Wednesday, Nov. 16, at 7 P.M. Tickets may be had from the association at 4, Great Russell Street, W.C.1.

National Association for Mental Health

An *inter-clinic conference* will be held on Saturday, Dec. 3, at Queen Mary Hall, Y.W.C.A. Central Club, Great Russell Street, London, W.C.1, for the professional staff of child-guidance teams. Applications should be sent to the conference secretary, at 39, Queen Anne Street, W.1.

Exhibition of Medical Photography

Members of the medical group of the Royal Photographic Society are holding an exhibition in the faculty room of the Bristol Royal Infirmary from Oct. 31 to Nov. 12, from 10 A.M. to 5 P.M. (Saturdays 10 A.M. to 1 P.M.). This exhibition was shown in July in London (see *Lancet*, July 9, p. 65).

South-East Metropolitan Regional Tuberculosis Society

A meeting of this society will be held at Grove Park Hospital, Marvels Lane, Lee, S.E.12, on Saturday, Nov. 12, at 10.30 A.M., when papers will be read by Dr. M. M. Nagley, Dr. Geoffrey Beven, and Mr. Alistair Gunn. There will also be a demonstration of mass miniature-radiography films.

Manchester Royal Infirmary Old Residents' Club

It is proposed to hold the 10th reunion dinner of this club on March 25 at Belle Vue, Manchester. Members will be sent further details early in December, and any former resident whose name may have been overlooked on a previous occasion is asked to write to the honorary secretary, Dr. O. Janus, at the Infirmary.

Diets for Patients with Steatorrhœa

The Ministry of Food announces that patients suffering from acute or convalescent steatorrhœa (including cœliac disease and tropical sprue) who are entitled to half-cream National Dried Milk may, if they wish, take half-cream proprietary infant milk food instead. The maximum allowance remains at one tin a week.

University College Hospital

The annual meeting of the hospital will be held at 5.30 P.M. on Tuesday, Nov. 1, in the medical school, University Street, London, W.C.1, when Major-General Sir Harold Wernher, the chairman of the board of governors, will present the *annual report* of the activities of the hospital including St. Pancras Hospital and the Hospital for Tropical Diseases. Members of the public are invited to attend.

Royal Microscopical Society

On Wednesday, Nov. 2, at 6 P.M., at a meeting of the biological section, Dr. G. A. Harrison, and Mr. M. G. L. Curties, F.R.M.S., will speak on Inexpensive Phase Microscopy. On Wednesday, Nov. 16, at 5.30 P.M., Dr. G. M. Findlay and Mr. F. C. Grigg, F.R.M.S., will address the society on Cytology of the Neurone in Experimental Poliomyelitis. Both meetings will take place at B.M.A. House, Tavistock Square, London, W.C.1.

Postgraduate Travelling Fellowships

The British Postgraduate Medical Federation (University of London) is offering a limited number of these fellowships, tenable for one year, to registered medical practitioners who are at present holding an appointment or are engaged in postgraduate study at one of the undergraduate or postgraduate teaching hospitals or medical schools of the University of London. Further information will be found in our advertisement columns.

Society of Medical Officers of Health

The annual dinner of this society will be held at Piccadilly Hotel, London, W.1, on Thursday, Nov. 7.30 P.M.

Appointments

MITCHELL, J. B., M.D. Lond: asst. chest physician (senior Cambridge area.
MURRAY, R. S., M.D. Belf., F.R.C.S.I., D.M.R.: asst. London Hospital.
PRICE, D. E., M.B. Lond.: consultant pathologist in charge, group of hospitals.
SUTTON, P. H., M.D., B.SC. Lond., M.R.C.P.: asst. chest *(senior registrar), East Norfolk area.*

Colonial Service:

CHEVERTON, R. L., M.R.C.S.: director of medical services, Coast.
MADGE, E. H., M.B. Lond.: medical superintendent, Hospital, Mauritius.
NUNN, J. F., M.B. Birm.: M.O., Federation of Malaya.
ROZALLA, M. A., M.B. Calcutta: M.O., Sarawak.
TONKING, H. D., M.R.C.S.: pathologist, Nigeria.
WALKO, Z. S., M.D. Beirut: asst. M.O., St. Lucia, W Islands.

Diary of the Week

OCT. 30 TO NOV. 5

Tuesday, 1st

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn W.C.1
2.15 P.M. Mr. E. H. R. Harries: Respiratory Tract in Diseases.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. W. J. O'Donovan: Arsenic and the Skin.

Wednesday, 2nd

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Place, W.1
3.30 P.M. Dr. A. G. G. Thompson: Preparation of Food Human Consumption.

Thursday, 3rd

UNIVERSITY OF LONDON
5 P.M. (1, Wimpole Street, W.1.) Mr. A. J. Wright: Function. (Semon lecture.)

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
2.15 P.M. (1, Wimpole Street, W.1.) Mr. G. Grey Wa SC.D.: Function of Electrical Rhythms in the (Maudsley lecture.)

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
2.15 P.M. Mr. I. Simson Hall: Surgical Treatment of sclerosis.

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. B. Russell: Nutritional Disorders of the Skin.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Anthony Feiling: Neurology lecture-demonstration.

WELSH NATIONAL SCHOOL OF MEDICINE
8 P.M. (Institute of Engineers, Park Place, Cardiff.) Sir Gor Gordon-Taylor: Surgery of the Innominate Art (Sheen lecture.)

HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, E Dr. R. M. Stewart: G.P.I.—its Juvenile and Senile T.

Friday, 4th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Anne Street, W.1
NOON. Mr. Leslie Williams: Postoperative Venous
3 P.M. Prof. J. F. Cunningham: Secondary Abdominal nancy.
5 P.M. Mr. John Howkins: Mayo's Vaginal Hysterectomy in Treatment of Prolapse.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES MEDICAL SCHO W.9.
5 P.M. Dr. W. Russell Brain: Clinical demonstration.

Saturday, 5th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
9.45 A.M. Dr. G. M. Bull: Treatment of Anuria.
11.30 A.M. Mr. D. H. MacLeod: Endometriosis.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
11 A.M. (Postgraduate Medical School of London, Ducane Ro W.12.) Dr. A. M. Ramsay: Puerperal Infections.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
11.15 A.M. Mr. Henry Foster: Examination and Treatment Children, particularly *those of School Age.*

YORK MEDICAL SOCIETY, 17, Stonegate, York
8.30 P.M. Dr. H. W. Barber: Diseases of the Skin of Interest General Practitioners.

smallpox to cancer. This is, of course, quite true.
could do the same with chemical substances in
ble amounts from cantharidin to methylcholan-
e. Yet such a comparison of similar properties of
s with specific effects fails to inform one about their
fic differences, which, after all, is what concerns us.
does one virus come to cause necrosis while another
s such a vastly different state of affairs as prolifera-
in apparent perpetuity when grown under favourable
itions of transplantation ?

ese differences may be illustrated by reference to
ox, to herpes simplex, and to the tumour of the
e papilloma virus. Epithelial cells with cytoplasm
et wholly occupied by inclusion bodies of cowpox,
the nucleus displaced and compressed, eventually
nd are lost in a scab. The process could not be
ted and reversed by transplantation. The infected
in herpes, after a preliminary swelling and some-
s nuclear multiplication, gradually undergo lysis,
sce into vesicles, and are lost. The virus in an
tive state may remain in cells that repair the lesion.
ultimate activity is always destructive nor can it be
sted or reversed by transplantation. Contrast this
early or late infection with the Shope papilloma
s. Here the cells have multiplied vigorously to make
rge cell mass ; keratohyalin granules and keratin
e been produced. The surface and aged cells ultimately
but this process can be arrested by autotrans-
ntation of the still living cells which will continue to
r in a new position or even host.

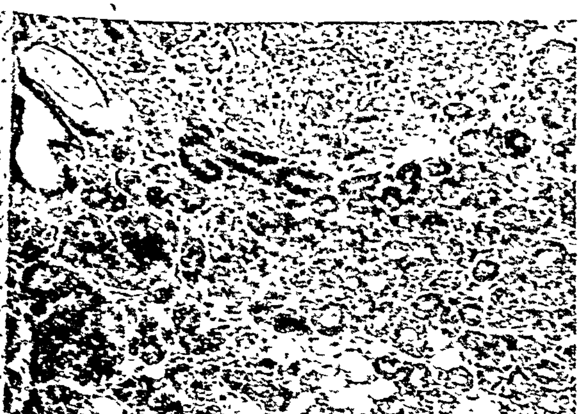
rom the viewpoint of their pathological effects on
s, viruses may more usefully be placed in three groups :

) The *cytoclastic* break up and destroy cells. One may
pose that this effect is due to their production in combina-
with living cells of some substance noxious to the cell,
s brought about by denial, through interference, of some
stance essential to the cell's metabolism.

2) The *symbiotic* live as passengers, neither harming nor
ecting the host cells. Their own metabolism is perhaps
erfect conformity with that of the cells.

3) The *formative* combine with the cells to cause cell
liferation and their own reproduction.

is common sense to suppose that whatever formative
nts do in cells in subserving their own urge to repro-
e is in conformity with the well-being of the infected
ls though not of the host. These viruses may have
ne of the characters of passenger viruses but they
re also something more. In the case of Bittner agents
hereditary mammary tumours, they cause the cells to
ide and to mimic the structural and secretory responses
at only specific stimulants are able to arouse in normal
ls. If one does not assume that the virus, in combina-
n with infected cells, produces a substance having an œstrogen-like property of stimulating cell division, functional differentiation, and secretion, one has to assume that some quite different, perhaps unrelated, chemical entity has these several separate capacities. This second assumption has less to commend it on grounds of Nature's economy. There is also the possibility that both œstrogen and virus excite an intracellular link that effects these changes, a hypothesis that would be extremely difficult to test.



ig. 4.—Mammary tumour showing acinus formation and secretion, four months after the last skin application of œstrone, in a male mouse inoculated with the Bittner agent. (× 150.)

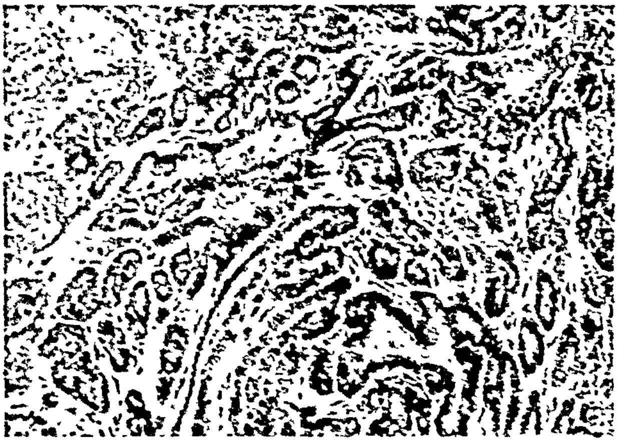


Fig. 5.—Mammary tumour induced with methylcholanthrene (8) in an I.F. strain mouse probably free of the Bittner agent. (× 150.)

THE STIMULUS TO CELL DIVISION

In the earlier days of cancer research it was considered premature to delve into such matters as the probable nature of the stimulus to cell division. Commenting on the subject, W. E. Gye (1925) wrote :

> " The complete failure to provide a unifying conception of the disease has led cancer specialists to look upon the malignant transformation of a cell as a physiological reaction—or a perversion of a physiological reaction—to long-continued irritation. In other words, the disease is regarded as a particular problem in cell physiology and, however clearly external agents may be demonstrated as factors in the chain of causation of tumours their influence is considered to be entirely subsidiary to internal cellular capacities, and particularly to those which relate to cell division. In the final analysis of the pathology of tumours all this may turn out to be true, but as relatively little is known in this branch of physiology, it is premature to indulge in speculation."

That was a quarter of a century ago, and in the meantime endocrinology, a branch of physiology, has provided the key that not only enables one to speculate but also to put that speculation on trial.

The experimental pathologist must be in full accord with the dictum of Peyton Rous that " no explanation of the cause of cancer is worthy of attention that cannot be tested " (Rous and Botsford 1932). Here at any rate is an idea that can be tested, but as yet I do not know whether it is a correct one. The problem is most laborious, technically and I shall show later where the chief exertions lie. First, it is well to consider the relation of the solitary non-virus-containing mammary tumours to the hypothesis that they also are producing intracellularly their own œstrogen-like stimulus to cell division and that they transmit this property in perpetuity. These tumours contain neither an agent which is foreign to the cell nor any clue to the means of cell division. Nevertheless they are morphologically indistinguishable from the multiple virus-containing tumours.

Figs. 4 and 5 illustrate two fields from two comparable tumours of the two origins, one hereditary one induced, both showing differentiation with, here and there, secretion. The one contained the Bittner agent and was transmissible by cell-free extracts ; the other illustration was

TABLE I—CHARACTERISTICS OF MAMMARY CARCINOMAS IN MICE

Type	Agent	Herit-able	Morpho-logy	Rôle of extra-cellular œstrogen	Age incidence
Spontaneous (*a*) Multiple	Bittner's	Yes	Adeno-*carcinoma*	To start and only some-times promote	Young breeders and some virgins
(*b*) Solitary	None found	No	Adeno-carcinoma and squamous carcinoma	To start	Old breeders only
Induced Multiple or solitary	Chemical carcino-gen to start	No	Adeno-squamous, and mixed carcinoma	To start only	Young breeders, virgins, or males

ovaries are removed, only homonymous growth occurs, without elaboration of branches and without functional differentiation. Of the known normal stimuli, œstrogens, both natural and synthetic, are the most vigorous, surpassed only by combination with progesterone. It is thought by some experimenters—and some better evidence has recently been adduced in support of this belief (Jacobsohn 1948)—that a hormone of the anterior pituitary, the mammogen of C. W. Turner and colleagues (Mixner and Turner 1943), also acts as a stimulant and differentiating agent in the mammary gland. Another powerful stimulant, but one that is pathological and usually but not invariably focal in its effects, is the Bittner agent, a virus-like infection of heritable mammary tumours of mice. A third type of powerful focal stimulus, also pathological, the nature of which has so far eluded all search, starts and perpetuates the growth of those mammary tumours, both adenocarcinomas and squamous carcinomas, from which all trace of the Bittner agent is lacking. These growth responses are pathological, giving rise eventually to tumours. Both types, those associated with a virus and those without, occur at isolated foci in the mammary tree. Those in which no agent is found are solitary, those containing the agent multiple. Each has a typical age-incidence. Both differentiate into well-formed acini and evidence of secretion is often found. Their biological characters are thus distinctive—some similar, others quite different, as will be seen in table I.

Both types of adenocarcinomas require ovarian hormone at their initiation, but once they have undergone malignant change they usually grow quite independently of the hormone. My colleague, Dr. Foulds, has found some interesting exceptions among spontaneous and grafted heritable tumours and shown without doubt that they are dependent—though only temporarily—upon ovarian hormone for vigorous growth as distinct from survival (Foulds 1949). The majority, when grafted into males or ovariectomised females, grow as well as ever in the absence of any but undetectable and hypothetical amounts of circulating hormone. The constituent cells are seen in microscopic sections to have been proliferating actively, to have differentiated into acini, and, very often, to have produced secretion also (fig. 3). Since these tumours grow in male and ovariectomised female mice, we may conclude, as indeed we already know, that this cell division, multiplication, functional differentiation, and secretion are independent of ovarian hormone derived from *outside the tumour*. These responses then are inherent potentialities of the tumour cell as they are of the cell of origin.

One is here reminded that, to realise and reveal these inherent potentialities in the normal prototype, one had to provide the competent cell with an adequate stimulus, adequate both qualitatively and quantitatively. Thus it seems highly probable and an economy in assumptions to suppose that the competence of tumour cells to divide, differentiate, and secrete entails also a similar adequate stimulus.

Apart from this similarity in morphological between the differentiated pathological cell and normal œstrogen-stimulated cell, there is no clue *nature of the stimulant*, either to cell division differentiation in these tumours. Thus for the the impulse may be supposed to be a stimulant œstrogen-like properties, or perhaps having a to Turner's "mammogen." All that can be inferred it from other data is that it must be elaborated cellularly and perhaps used and assimilated achieving its end. A few preliminary which an adenocarcinoma was grafted between and 3rd mammæ of some spayed mice failed to differentiation in the neighbouring glands, there is no leakage from dividing and differenti

VIRUS AND HOST

The assumption that mammary tumour producing intracellularly their own stimulus œstrogen-like properties, to divide, differentiate, secrete, must be examined to decide whether or

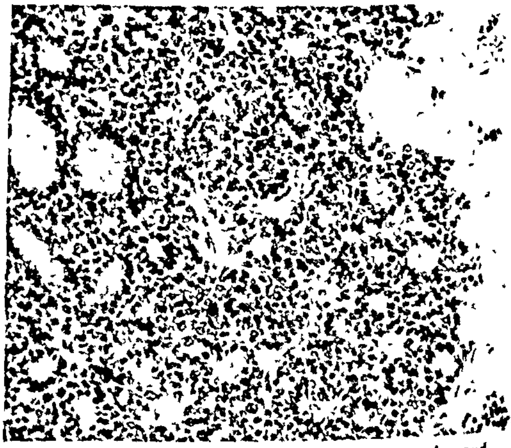


Fig. 3.—Mammary tumour showing acinus formation and an ovariectomised mouse carrying the Bittner agent. (×

conforms with other established data concerning mammary tumours and tumours in general. We that heritable mammary tumours of mice contain Bittner agent, a virus-like entity upon which depend for their spontaneous growth and natural mission, though it is less certain that the grafted are ultimately dependent upon the agent. Once it is an economy in assumptions to suppose that Bittner agent is effective because, in combination the living cell, it is able to elaborate some chemical œstrogen-like properties.

E. H. Kettle (1935) recorded his opinion in a delivered at St. Bartholomew's Hospital, and others have said the same before and since, that a parasite were universally accepted *tomorrow* as cause of cancer we should *still be as far as ever* understanding the cancer process." It is the pro province of pathology, including chemical pathology endocrinology, to unmask its magic and mystery. C. Andrewes (1934) conceived the tumour virus as exi in a state of equilibrium with the parasitised cell, lating it to divide but not destroying it, a state in neither destroyed the other. What we really want know is how all this comes about. Andrewes attention to examples of *every type of change* p *in* cells by the action of *a* virus, from pure necrosis pure proliferation, and expressed the opinion that could construct an ordered series of virus lesions extend

EXPERIMENT

liminary work to put these ideas on trial in relation mmary tumours has shown where some of the cal difficulties lie.

he first place, very large quantities of test tumour ial are required, because the hypothetical growth-ning œstrogen-like substance or "mammogen" ly to be present in very small amounts. The source material must be transplantable tumours, because imperative need to do control trials including rative assays. There is a natural temptation to use of abundant human material but it is out of estion to use it in any crucial tests. The largest source of natural œstrogen, the ovary, must be d: and I am informed by my colleague in endo-gy that scepticism must even then remain to ion whether all traces of extracellular œstrogen been excluded. Traces must be deliberately sought r growing a different type of tumour—a sarcoma, xample—in parallel in the same or in alternate ls and putting it through identical trials. That is st of reality in this particular experiment.

ere is, next, the possibility that the intracellular lus is not similar to œstrogen but rather a protein one or "mammogen," and there is one reason st the supposition of an œstrogen-like nature. is the fact that the mammæ of mice are never lated by *extracellular* œstrogen alone (in the absence ttner's agent) to grow beyond the extreme limits of ormal. In rats, however, excess of applied œstrogen cause mammary tumours in some stocks (Dunning . 1947).

ere are also a few examples of excess of histospecific ones causing tumours—for example stimulation of dotropin by œstrone or by direct action of œstrogens ting in testicular growths (Bonser and Robson). The idea put forward, if it is to have a general ication, requires that one proposes a stimulus for y type of malignant cell. Lately, for some students' res, I searched the pathology of repair, regeneration, hyperplasia to find whether there were any chemical tances known to excite cell division. It was an sting experience to realise that, not until one came he histospecific hormonal hyperplasias did one find chemical substances of this nature. Cell division and tiplication occur, as one knows, in many circum-ces and conditions which end with healing or irrita-hyperplasia, but in none of these conditions has imarily stimulating chemical agent been defined. On other hand, the only substances of an identifiable nical nature associated, apparently primarily, with division are (strange to say) effective by their absence. in the healing of simple trauma it is even suggested, a most cogent experimental proof, that the immediate ulus to cell division is cell scarcity (Wigglesworth 7). Stimulation by anoxia after hæmorrhage and at h altitudes results in increase in red blood corpuscles. other effective absence is that of iodine resulting in roid hyperplasia; yet another is hypocalcæmia which nulates parathyroid growth. It is possible, of course, t these are but links in a chain of causation and that owledge of the immediate stimulus is lacking. There also embryologists and others who do not believe at cell division requires extracellular stimuli.

Some ideas for a search for intracellular tumour-cell muli are to be found in table II. Besides mammary enocarcinomas, the best and most readily available owths for test would be the secreting adenocarcinomas the prostate induced by E. S. Horning and testicular umours by Bonser and Robson (1940). The guess that e intracellular stimulants are respectively androgen and onadotropin rests upon known relationships in normal d pathological growth. There is also supporting idence in the case of induced prostatic tumours in the depressing effect on growth of grafts of withdrawal of androgen (Horning 1949): in human spontaneous tumours of the antagonistic action of œstrogens. One may hazard the guess that the reason why œstrogens are not more effective is their inability to affect the source of production of androgen. The product may be rendered partially or even completely ineffective, but the mechanism remains.

TABLE II—SUGGESTIONS FOR THE INTRACELLULAR SELF-STIMULUS OF SOME EXPERIMENTAL TUMOURS

Type of tumour	Heritable intra-cellular stimulus	Detection and assay
Mammary adeno-carcinomas	Œstrogen-like steroid (or anterior pituitary "mammogen")	Mammary response in young spayed females
Prostate adeno-carcinomas	Androgen	Various assays
Testicular carcinomas	Gonadotropin or œstrogen	Testicular response
Thyroid adeno-carcinomas	Thyrotropic hormones	Various assays
Luteomas	Gonadotropin	Luteinising activity
Suprarenal-cortical tumours	Adrenocorticotropin	Repair and maintenance tests
Leukæmias	? Myeloid metaplasia factor in urine	Blood-count

Thus it will be seen that the possibility of testing this theory in relation to tumours in general depends on the fulfilment of four requirements:

(1) a guess must be made, or previous knowledge exist, of the normal histospecific stimulus to division of the cell of origin of the tumour;

(2) extraction of this hypothetical substance from transplantable tumours;

(3) identification and possibly assay accompanied by

(4) all relevant and proper controls duly devised for their reality-testing purpose.

Much depends upon extractability. It is indeed probable that the very stimulants we seek are assimilated into the substance of the cell and so combined that they are not separately extractable.

The first necessity, the guess concerning the chemical nature of the stimulus, is also a source of great difficulty, because of our lack of knowledge of normal stimuli. That same ignorance—so prevalent in pathology—was encountered on inquiring into experimental embryology also. Apparently the great endeavour to determine the nature of evocators ended, one hopes only temporarily, in an embarrassment of non-specific stimuli. So, assuming that Nature is economical in her means and uses similar substances for similar ends, the histospecific hormones alone provide clues for the first experimental trials. They are sufficient and worthy to go on with.

SUMMARY

The convergence of two groups of observations led to the hypothesis that mammary tumour cells produce intracellularly an œstrogen-like substance or "mammogen."

The first set of observations were based on attempts at assessment of the relationship of dosage and response between œstrone and the mammary glands of spayed mice at puberty. Results indicated that lobular-alveolar or acinus formation and secretion depended upon a specific stimulus applied in adequate quantity. In the absence of a specific stimulus there was no response.

The second set of observations concerned the known property of spontaneous mammary carcinomas of mice to differentiate into acini and produce secretion, and to retain these characteristics when grafted into ovariectomised female or male mice. The conclusion was reached that this response also is most probably due to intracellular production of an œstrogen-like substance.

kindly given me by Dr. Dmochowski and Professor Orr, of Professor Passey's department in Leeds. The second tumour was produced in an IF strain mouse by means of methylcholanthrene. This strain, bred originally by Dr. Bonser, is most probably free of Bittner's agent and the tumour itself has been exhaustively tested by every known means for the presence of agent and none was found. Products from it were examined in Leeds by electron microscopy and no particles found; extracts were injected into young susceptible mice, which in later life as breeders failed to develop mammary tumours themselves (Dmochowski and Orr 1949). Nothing, it seems, save the omnipotence of thought can endow either that tumour or many like it with any known virus-like agent. Nevertheless, the morphological characters of the tumour suggest that it also is elaborating an œstrogen-like intracellular stimulus and has the capacity to transmit this property.

The obvious course once again is to put the idea on trial; but, since scientific endeavour is costly in time and money and life is short and restricted, it is worth while taking stock of the position as a whole to see whether the attempt justifies the effort entailed. It will be justified only if the hypothesis of an intracellularly generated self-stimulus to division affords an explanation of tumour growth in general. Four imperative conditions will then have to be met, starting from the assumption, itself open to question, that cell division in multicellular organisms requires some stimulus other than adequate nutrition. This assumption will be contested by microbiologists and by at least some embryologists. Even so, one of the former—A. W. Peters—on the basis of experimental work with Stentor considered that potassium exerted a specific qualitative effect, other than that on osmosis, in exciting cell division (Peters 1904). In respect of tumours in multicellular organisms a working hypothesis must be based on some assumption in respect of the stimulus to cell division. One must believe in and look for either a positive stimulus or else in a removal of an inhibition. I myself look for a positive stimulus, a decision which is arbitrary perhaps and may be wrong. Yet it appears to conform to the need of most living things, for an impulse to call forth activity. Though our ignorance of stimuli to division of somatic cells is very great, the responses to the histospecific hormones are pointers to the existence of actual positive stimuli.

Having then assumed the need for an impulse for cell division:

(1) Provision must be made by the theory for the presence in tumour cells of a specified intracellular self-stimulus to division. (The facts relating to tumour grafting demand that this condition be fulfilled. Grafting of tumour material from animal to animal in successive generations of grafts to which no limit can yet be set proves that the malignant property is inherent in the cells themselves and is conveyed with them from host to host.)

(2) A mechanism must be suggested for the linear transmission of this stimulus in somatic cells.

(3) A plan must be provided for experimental trial.

(4) The plan must be amenable to reality-testing by control experiments.

So far the virus theory, as a theory, has most satisfactorily filled the bill because it provided the self-stimulus to division and also its means of transmission. The virus was the stimulus, though its method of action remained a mystery that has never been inquired into as far as I know. As the cell divided, the virus was passed on and itself multiplied. Where this theory has failed is in deliberate attempts at straightforward trials by planned experiment, duly controlled, except in the general instance of avian sarcomas and also the leopard-frog tumour and Shope papilloma. Otherwise those tumour viruses which are known to us have been found accidentally under exceptional conditions of
The story is too familiar to need repeating.
failure may be due to lack of ingenuity in devising experiments.

A CHANGE IN CELL CHEMISTRY ?

The results of mammary-gland assays and
of mammary tumours growing in male and
female mice have let in a glimmer of
concerning the probable way in which one
Bittner agent—brings about its effects. If it is
that an infecting virus may act in combination
living cells to stimulate cell division and fun
differentiation, then it seems not improbable that
same sort of chemical elaboration in the cell might
about in other ways. It has always been a
of the so-called theory of somatic mutation
merely provided what W. E. Gye and others
as a verbal explanation of what we already know.
said that a heritable change had occurred in
cells. There are many other adverse criticisms of
theory, nor can it be put on trial. If, however, one
aside the old formula and says simply that the
cell has undergone a change in chemical p
so that it has come to elaborate its own stimulus
cell division, then there are certain circumstances
which the theory can be tested. A theory stated in
way may fulfil three out of the four imperatives of
explanation of tumour growth: the first, third,
fourth. It does not account for transmission. Yet
know from the fact of functional differentiation
ontogeny that changes in cell chemistry occur and t
they are thereafter heritable.

In adult cells heritable shifts in chemical pro
are sometimes seen in tumours. It is often a ma
debate whether a change is in a new direction, w
a true metaplasia has occurred rather than rev
to the cell of origin.† Some recent examples of
tumours indicate complete reversibility in either
direction of secretory activity or of keratinisation.
such tumour is that induced in prostatic epithelium
Dr. Horning (1949). It frequently starts as a
secreting adenocarcinoma, but after several ge
of grafting it becomes a keratinised tumour. His fig
is a specially convincing specimen, showing
cells in the interior of an alveolus and squamous
which appear to have arisen directly from them, spre
at the periphery. Here the change in chemical
tivity is from a fluid-containing soluble protein and
lipides to a type of cell which yields only keratin. In
mammary gland mixed adenocarcinomas and squam
carcinomas are often seen in which there appears to
reversibility between cells differentiated to secrete
proteins, fats, and sugar to cells that produce ke
only, and vice versa. Underlying the structural
bility one must suppose a change in chemical prod
tivity, and it does not appear unreasonable or
to suggest that an invisible intracellular chemical stim
to division might also be elaborated and then the capaci
become heritable in somatic cells. In the case of
mary adenocarcinomas it might be an œst
steroid or a "mammogen"; in the prostate an androgen.

The idea is in harmony with that expressed by J. B. S
Haldane (1934). He thought it reasonable to regard carcinogenesis as "anomalous differentiation rather than mutation." The anomaly would consist in a change in intracellular chemistry in the direction of elaborating its own stimulus to division and sometimes also to functional differentiation.

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† Since this lecture was given I have been reminded that J. A. Murray (3rd Scientific Report of the Imperial Cancer Research Fund, 1908, p. 159), argued in favour of reversibility of growth forms in mammary tumours.

DETAILS OF MANAGEMENT

patient is given 500,000 units of penicillin every -four hours, in divided doses, by intramuscular on.

er infiltration anæsthesia a burr-hole is made over e of the abscess—except when the abscess follows yelitis of the skull, in which case the dura mater sed by the removal of the infected bone, and a l anæsthetic should be employed because of the ce of superficial sepsis. In the region of the posterior a burr-hole is somewhat more difficult to make, to the thickness of the muscles.

nall cut is made in the dura mater; a brain cannula sed into the abscess; and some of the pus is ted. A mixture of penicillin solution and diodone ore than 2–3 ml.) is then injected into the cavity diograms are taken to show the exact position and the abscess. Before the cannula is withdrawn, the ning pus is aspirated and a further quantity of llin solution is injected into the cavity. It is tant that the penicillin should be of the highest , and that the solution should be concentrated 00 units per ml.) so that its volume will not disrupt scess wall.

st authors recommend 'Thorotrast' as an opaque m (Kahn 1939). It has the advantage that it ns in the abscess and enables one to observe action or expansion of the capsule. But there is imental evidence that thorotrast stimulates capsule tion (Falconer et al. 1943) and we prefer a completely bable substance.

casionally an abscess will heal after one penicillin-cement, but usually several replacements will be red, and these can be done with the scalp sutures t. Considerable judgment is needed in deciding the g of the aspirations, and careful attention should id *each day* to the patient's general and neurological . Further replacements should be undertaken on lightest evidence that he is not progressing—e.g., re of the level of consciousness to improve, persisting ache, vomiting, a change in the pulse-rate (either ase or decrease) or failure of the papillœdema and ocalising signs to subside. To begin with, needling be required at intervals of a day or two, but when ress is satisfactory the intervals become longer until ore pus can be obtained. One of the effects of the cillin is to keep the pus thin, thus allowing aspiration e continued. If despite aspiration and penicillin-cement the patient's condition ceases to improve, or riorates, then either the capsule of the abscess is , and is acting as a "tumour," or the abscess is locular. In these circumstances ventriculography ld be carried out and preparation made for the total oval of the abscess. (There is also the possibility of e than one abscess when the thorax is the source of primary infection.)

efore the enucleation is done, penicillin (10,000 units ml. normal saline) is injected into the ventricles ugh one of the burr-holes used for the ventriculo-phy and also by lumbar puncture. An osteoplastic is then made over the site of the abscess; or when is in the posterior fossa a cerebellar exposure is used. dura mater is incised and the abscess exposed by removal of overlying brain tissue. The capsule is n carefully dissected out, and when complete hæmo-sis has been secured penicillin-sulphadimidine powder lusted into the remaining cavity. The wound is closed hout drainage.

When an operation is done for an abscess arising from eglected open fracture, loose fragments of bone and eign bodies are removed. The abscess itself is slowly d gently extracted by suction until a clean-looking vity is obtained. The wound is then closed without ainage. If the scalp is deficient over the fracture one of the usual plastic methods of covering the defect is employed.

A brain abscess may sometimes follow a chronic course, the onset of pressure effects and localising signs being delayed. In these cases the abscess persists as an almost solid mass of fibrous tissue giving rise to a picture indistinguishable from that of a tumour. In such a case total excision is indicated.

A patient with an abscess may develop meningitis; or a patient with meningitis, who is not making satisfactory progress, may be harbouring an abscess, either in the brain or encysted in the subarachnoid space. Thus in cases of meningitis complete and frequent neurological examinations are of great importance. These cases of meningitis associated with an abscess can be treated successfully by chemotherapy with surgery on the principles described above.

TREATMENT OF THE FOCUS OF INFECTION

As the brain abscess constitutes the immediate threat to life, it should be treated surgically before the primary source of infection, except in the case of osteomyelitis of the skull when the diseased bone should be removed during the attack on the abscess. Where the primary lesion is in the lungs it is important that radical surgical treatment should be undertaken as soon as the patient's condition allows; for there is a tendency for further metastatic brain abscesses to form (Pennybacker and Sellors 1948). With otitis there is not the same urgency; but there is no reason to delay mastoidectomy once the intracranial lesion has healed.

CASE-RECORDS

Following these principles we have had only one death in the last eight cases of brain abscess admitted to Oldchurch Hospital, Romford, and the West End Hospital for Nervous Diseases.

Case 1.—*Boy aged 15. Left mastoiditis, meningitis, cerebellar abscess. Treated by aspiration and penicillin-replacement. Recovery.*

The patient was admitted to hospital on Sept. 5, 1945, with a history of a discharging left ear, tenderness behind the ear, headache, photophobia, and neck stiffness. He was diagnosed as having mastoiditis with meningitis. A cortical mastoidectomy was performed and the formerly purulent cerebrospinal fluid (C.S.F.) became normal under penicillin therapy, though his fever never settled completely.

Three weeks later he developed more headache and neck rigidity. Bilateral papillœdema was found and shortly afterwards cerebellar signs were apparent in the left arm. A diagnosis of cerebellar abscess was made, and on Sept. 30 a posterior-fossa decompression was performed and the left cerebellar hemisphere was needled through the dura mater with aspiration of 6 ml. of pus (culture: anaerobic non-hæmolytic streptococci). Two days later he became more drowsy and the abscess was tapped. A further 11 ml. of pus was aspirated and penicillin (20,000 units) was injected into the abscess cavity and along the needle tract. On five occasions during the next twelve days, because of headaches and increasing drowsiness, pus was again aspirated and penicillin injected.

On the next two attempts no pus was aspirated though the brain needle encountered increased resistance. The cerebellar signs had largely cleared, but the boy still had papillœdema, was vomiting, and complained of severe headaches. It was thought that an abscess capsule was causing pressure effects, and on Oct. 27 a further posterior-fossa exploration was carried out and the dura mater was opened. Examination of the left cerebellar hemisphere, however, showed no evidence of any abscess capsule. The abscess appeared to have r solved completely. After this second operation the boy made a steady recovery; he was discharged from hospital on Jan. 9, 1946, and has since remained well, leading a normal life.

This case established the important fact that repeated aspiration of pus, with penicillin-replacement, can cause a brain abscess to resolve so completely that there are no signs of it at operation.

In the case of inherited tumours of mice due to the Bittner agent it is conceivable that the agent in combination with mammary cells is producing some such substance; in the case of agent-free tumours the suggestion is made that a heritable change in chemical productivity has occurred in mammary cells resulting in the production by the cell of its own chemical stimulus to division and differentiation.

The hypothesis is examined in relation to the tumour problem in general and a forecast made of the intracellular impulses of some other types of tumour together with indications for testing its validity.

I am greatly indebted to Dr. C. C. Spicer who undertook the whole of the statistical work. Also to Dr. L. Dmochowski and Prof. J. W. Orr, and to Prof. R. D. Passey for permission to use their material.

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THE TREATMENT OF BRAIN ABSCESS

WITH SPECIAL REFERENCE TO A CONSERVATIVE METHOD

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BEFORE the days of penicillin many of the lessons learned by neurosurgeons in dealing with intracranial tumours had been applied to the management of brain abscess. Penicillin, used in conjunction with sound surgery, has made brain abscess one of the most satisfactory conditions the neurosurgeon is called upon to treat. The essentials are (1) accuracy of diagnosis and localisation, (2) application of the neurosurgical principles governing treatment of a space-occupying lesion, together with those that apply to sepsis, and (3) day-to-day review of the patient's general and neurological state.

Today there are two main schools of thought regarding the treatment of brain abscess. In some centres the abscess is extirpated as soon as it is thought that an adequate capsule will be found (Vincent 1937, 1938, Pennybacker 1948). The formation of such a capsule takes several weeks, during which period aspiration and sometimes decompression will be needed if the patient's condition deteriorates substantially. In other centres, particularly in America (Klemme 1948) and France (Le Beau 1946), the introduction of penicillin has encouraged radical excision of all abscesses as soon as they are diagnosed and preferably before a capsule has had time to form.

The purpose of this article is to recommend a third and more conservative method of treatment—namely aspiration and penicillin-replacement alone—and to reconcile all three methods. But first we shall summarise the causes of abscess.

CAUSES OF BRAIN ABSCESS

1. *Septic Lesions of the Thorax.*—A brain especially liable to follow operations for septic of the lungs and pleura (e.g., lobectomy for and drainage of an empyema). This type of become commoner with the development of surgery. Septic secondary deposits from the bronchus may cause confusion in diagnosis.

2. *Middle-ear and Mastoid Infection.*—An the temporal lobe or the cerebellum may arise infection in the middle ear or mastoid, chronic cases associated with the inflammatory cholesteatoma. The incidence appears to be much as the result of recent advances in chemotherapy.

3. *Infection of the Frontal and Ethmoidal Sinuses.*

4. *Open Injuries of the Skull.*—The regards a fracture of the skull as "open" when the mater has been penetrated. With such an injury, abscess is almost certain to form if fragments of hair, or hat-material have been left in the subs the brain. A bullet is much less likely to be the of an abscess, and damage to vital structures be risked for the sake of its removal. Such cases however, be followed up, for an abscess may arise years after the injury.

5. *Osteomyelitis of the Skull* is usually caused blood-borne *Staphylococcus aureus* but may also fol infection of the nasal sinuses or the scalp. A scalp tion may produce a cerebral abscess without infection of the bone.

6. *Septic Disease Anywhere.*—Examples: osteomyelitis, whitlow, tonsillitis.

7. Where there is *no apparent cause* for abscess, condition is likely to be diagnosed as malignant glio We have seen a case in which the signs of a space o pying lesion developed a few weeks after a closed h injury. A burr-hole was made for the evacuation o suspected subdural hæmatoma, but the subdural sp was clear. The brain was next needled in search of intracerebral hæmatoma, but instead the needle ente a large abscess. No focus of origin for the infection co be found.

BACTERIOLOGY

Organisms isolated from abscesses of the brain incl *Staph. aureus* and *albus*, *Streptococcus pyogenes*, and *pneumoniæ*, *Pseudomonas pyocyanea*, *Proteus vul*, actinomyces, diphtheroids, and *Hæmophilus influenzæ.* some cases a mixed growth of organisms is obtained. is important to determine the nature of the respons organisms and to test their sensitivity to penicillin, sulphonamides, and to streptomycin.

TREATMENT

The methods of treatment now available are:

1. *Delayed excision* after a capsule has had time to life being maintained by delayed penicillin-re and sometimes also by decompression (the dura being left intact). The object is to *encourage* the of a thick capsule.
2. *Immediate radical excision* as soon as the diagnosis made.
3. *Aspiration and penicillin-replacement without exci* begun as soon as the diagnosis is made and when necessary *without delay.*

There is no case for the universal application of an one of these methods, and our scheme of management embodies all three. The aim, however, should be to *discourage* the formation of a thick capsule by means of early and repeated aspiration and penicillin-replacement combined with *adequate intramuscular and intratheca* penicillin. Only if the abscess fails to resolve is it excise An abscess arising from a neglected open comminute fracture of the skull is removed by suction, as soon as is diagnosed.

May 18, 125 ml. of thick pus was aspirated from an ss in the right posterior frontal region and penicillin 0 units) was injected into the cavity. Radiograms taken the injection of iodoxyl showed a unilocular abscess -positive fragments of a branching mycelium were found pus.

er the aspiration the patient was less drowsy, but there o improvement in the paralysis. On May 25, 100 ml. of as aspirated from the abscess and 100,000 units of peni- injected. An aerobic actinomyces was isolated from the Next day the flaccid paralysis had become spastic. On 1, 110 ml. of pus was aspirated and 200,000 units of illin injected. After this aspiration, movement began arm in the left arm and leg. Eight days later only 5 ml. s could be aspirated from the abscess cavity, but the boy nued to improve steadily. By June 21 the papillœdema lisappeared and on July 26 he was walking unaided.

en in May, 1949, he walked normally and had begun to ride all bicycle. He attends school regularly and is doing very there. His mother says he is reluctant to use his left, gh it is as strong as the other.

ectroencephalography (Dr. D. Gordon) in May, 1949, a normal resting record. On overbreathing there was a p of sharp waves in the right frontoparietal region which no counterpart on the left; also there was one high- ice spike with phase reversal in the same area. This is estive of a focus of scarring in the area corresponding e abscess site.

ase 8.—*Man aged 52. Meningitis following a fall. Cere- r abscess. Treated by aspiration and penicillin-replacement. very.*

n Sept. 11, 1948, the patient fell off his bicycle, but ained abrasions only. A week later he developed rigors, lache, and neck stiffness. He was admitted to hospital re the C.S.F. was found to be purulent and grew *Staph. enes.* In spite of intrathecal and parenteral penicillin a course of sulphamezathine by mouth, he became easingly drowsy and developed a left-sided hemiparesis h was more pronounced in the arm than the leg. There also a right ptosis and mild bilateral papillœdema. On . 8 he was transferred to Oldchurch Hospital with a mosis of right frontal lobe abscess following meningitis.

n Oct. 12 the right frontal lobe was needled but no abscess found. A ventriculogram showed symmetrical lateral tricles which were grossly dilated. A burr-hole was made r the posterior fossa on both sides and an abscess was nd in the right cerebellar hemisphere. Several millilitres of k pus (sterile on culture), was aspirated and penicillin ,000 units) was injected into the abscess cavity.

he drowsiness and left-sided weakness improved. On r. 13, however, he became comatose again and the abscess retapped. Pus 7 ml. was aspirated (culture again sterile) penicillin was injected intrathecally, into the ventricles, into the abscess cavity. As his condition improved so ly, the abscess was tapped again on Nov. 19, but no pus was nd. Steady recovery followed and three weeks later he allowed to get up; but there was still weakness in the left er limb, especially at the wrist, and also slight incoordination the left arm. The power in the left leg was normal.

Three months later there was still weakness of the arm ugh walking continued to improve. He started light work June, 1949.

CONCLUSIONS

The delaying tactics required to encourage maturation a *thick* capsule with a view to ablation of an abscess e not without danger; death may occur suddenly m the effects of tentorial or cerebellar herniation, the capsule may rupture into a ventricle. The tient will usually survive the preliminary phase of is treatment, but the risks of removing the tumour" always remain. Neurological signs, either resent at the time of the diagnosis or developing uring the waiting period before enucleation, may not e relieved or may be made worse by the destructive ffects of dissection.

The method of early aspiration and penicillin-replace- ent aims at preventing the formation of a *thick* capsule, o as to obviate the major operation of enucleation. The actors making for success are early diagnosis, immediate leedling (repeated if possible before there are signs of urther expansion of the abscess), and the use of a contrast medium which is unlikely to stimulate capsule formation.

Although, in our experience, no abscess has recurred, there is the danger that resolution may be only apparent. Hence it may be thought advisable to carry out air-studies and other ancillary methods of investigation before the patient is discharged from hospital, and it is essential that all cases should be followed up at short intervals.

The number of patients we have treated by the conservative method is small, but the results justify a continued trial of the technique.

SUMMARY

An account of the causes of brain abscess is followed by a discussion of the present-day methods of treatment.

No single method is applicable to all cases; but the use of aspiration and penicillin-replacement, without excision, reduces the risk to life and function to a minimum, and is recommended for the majority of brain abscesses.

Eight case-records are presented to support the views expressed. In six cases aspiration and penicillin-replacement without excision of the abscess produced a cure, and in two of these cases only one needling was necessary. In the other two cases excision of the abscess could not be avoided.

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CONTINUOUS SPINAL BLOCK IN PUERPERAL HYPERTENSIVE ENCEPHALOPATHY WITH ANURIA

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Continuous spinal or peridural block as a means of treating hypertensive heart-failure has been recognised in the United States for several years. Sarnoff and Farr (1944) used single-dose spinal block in four cases of hypertensive heart-failure. Others (Pitkin and McCormack 1928, Cosgrove et al. 1937, Hingson and Edwards 1943) were impressed with the value of spinal and peridural analgesia for childbirth in patients handicapped by cardiac or respiratory disease. The benefit derived from this method may be attributed to the fall in blood-pressure, which reduces the load on an embarrassed heart—described by Dripps and Comroe (1946) as a "bloodless phlebotomy." The potentialities of spinal and peridural block as a therapeutic measure have been considerably increased by the introduction of continuous methods, associated with the names of Lemmon (1940) and Hingson.

These methods have received little publicity in this country, but the recent visit of Prof. Robert A. Hingson, of Baltimore, to Europe will doubtless stimulate further

Case 2.—*Man aged 33. Lung abscess following osteomyelitis of the femur. Left frontal abscess treated by aspiration and penicillin-replacement. Recovery.*

In 1939 the patient developed osteomyelitis of the right femur, followed by a chronic sinus in the thigh. In March, 1946, he had a hæmoptysis and signs of a lung abscess on the right side. He was admitted to hospital on Sept. 10, 1946, after a series of epileptic fits on the previous day. He had gross motor dysphasia and a right upper-motor-neurone facial weakness. The signs remained stationary until Oct. 15, when the left optic disc showed early papillœdema.

On Oct. 16 the brain was needled in Broca's area and 23 ml. of pus was aspirated from an abscess 3 cm. beneath the cortex. Culture was negative, but a film showed gram-positive cocci. Iodoxyl was used to verify the shape and size of the abscess and 80,000 units of penicillin was injected into the cavity. Two days later 42 ml. of pus was aspirated and a further 80,000 units of penicillin injected. Pus was obtained on four subsequent occasions in the next eight days. On Nov. 9, 1 ml. of iodoxyl was again injected into the cavity and radiography showed it to be much smaller. Two days later no pus was found on aspiration. Meanwhile his dysphasia and facial weakness steadily cleared up, and when he was discharged on Jan. 3, 1947, his speech was normal and his papillœdema had subsided.

On Oct. 11, 1947, he had a generalised epileptic fit, and since then he has had an attack every six months; these are becoming less severe on drug treatment. In March, 1948, he had a right pneumonectomy (Mr. Vernon C. Thompson) because his chest condition was not improving. He is now working a 48-hour week as a carpenter's mate.

Case 3.—*Boy aged 7. Depressed fracture of right frontal bone with cerebral laceration, and right frontal lobe abscess. Treatment by excision in the acute stage. Recovery.*

On Dec. 2, 1946, the patient sustained a head injury with a depressed fracture of the right frontal bone, though he was not rendered unconscious. The scalp wound went septic and he was admitted to Oldchurch Hospital eleven days after the accident because he had then been vomiting for two days. Examination showed an area of depression two inches above the outer canthus of the right eye, and an infected scalp wound was discharging clear fluid. His pulse-rate was 60 per minute, but there were no localising neurological signs.

At operation on Dec. 17 a right frontal scalp flap was elevated and the bone fragments were removed. The dura was found to be lacerated and an infected brain fungus protruded; a large abscess with no apparent capsule extended 3 cm. inwards towards the lateral ventricle. All the abscess material was sucked out until the surrounding brain tissue looked normal. Penicillin-sulphadiazine powder was used in all layers of the wound, which was closed in layers without drainage.

For a few hours after operation the boy was extremely shocked. Subsequently his convalescence was uneventful except that encysted fluid under the scalp flap had to be tapped several times. The bone defect was filled with rib-grafts on April 29, 1947, and he was discharged home three weeks later. In March, 1949 (aged 10), he was reported as very active physically but backward with his lessons (mental age, 7½).

In this case the open depressed fracture and lacerated brain demanded immediate operation, and excision of the abscess was the method of choice.

Case 4.—*Man aged 26. ? Cavernous sinus thrombosis, 1942. Right frontal brain abscess, treated by aspiration and excision, 1947. Death.*

In 1942 the patient collapsed with severe frontal headache. His eyes were puffy and he had many septic spots on his face. He was treated as a case of cavernous sinus thrombosis. Subsequently he developed bouts of frontal headache and swelling of the face which on two occasions (March and July, 1946) were relieved by antrum washouts. In September, 1946, he began to get painful spasms of the neck muscles, and frontal headaches. The condition fluctuated until April, 1947, when he began to be drowsy. Admitted to hospital on April 11, 1947, he was found to have bilateral papillœdema and exophthalmos, greater on the right side. He was thought to have had a recurrence of his cavernous sinus thrombosis, but despite penicillin injections his condition deteriorated and he developed a left facial weakness and a weakness of the left grip. On April 18 he was transferred to Oldchurch Hospital and diagnosed as a case of right frontal abscess.

At operation next day, 6 ml. of pus was aspirated right frontal region; but as it was felt that this pus was insufficient to account for his condition a gram was taken. This showed gross displacement ventricular system to the left. A bone flap was turned down and a large thick-walled abscess, firmly to the cribriform plate, was excised. The patient suddenly six hours after operation and died within Post-mortem and histological examination showed a able extent of *encephalitis posterior to the* abscess. cavernous sinuses appeared normal.

Case 5.—*Man aged 34. Chronic left ear infection, lobe abscess, treated by aspiration and penicillin- Recovery.*

This patient had had a discharging left ear since On May 21, 1947, he had a more profuse discharge headache, vomiting, and neck stiffness. The C.S.F. was to be purulent. He was admitted to Oldchurch May 29, at which time he was drowsy but able to *There was early papillœdema on the left side,* right motor-neurone facial paresis, and marked dysphasia. was also mild intermittent fever. The diagnosis temporal-lobe abscess associated with meningitis.

On May 30 the abscess was needled under local and 12 ml. of pus was aspirated (culture: *Staph. albus*). cillin 125,000 units was injected into the abscess cavity; of diodone was also injected and X-ray pictures showed thin cavity. *After aspiration there was steady* his speech and his headaches were also better. On June as he had some recurrence of his headache, though his was still improving, the temporal lobe was tapped but no evidence of any pus or of a capsule could be An uninterrupted recovery followed.

In October, 1947, a radical mastoidectomy was perf In July, 1949, he was quite fit and there were no signs.

Case 6.—*Woman aged 21. Left temporal abscess, three after dental treatment. Treatment by aspiration and pe replacement. Recovery.*

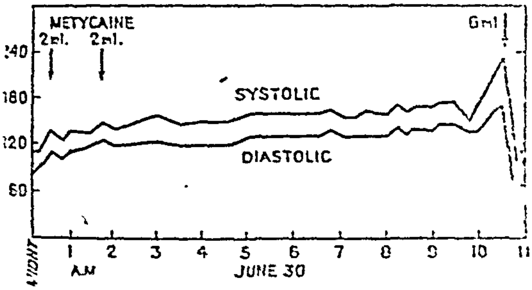
The patient was admitted to hospital on Feb. 11, 1948, a three weeks' history of headache, *pain in the* left ear side of the face, neck stiffness, and increasing forming sentences. These symptoms had appeared wi 24 hours of her having a tooth filled. On examination, could say only "yes" and "no" and understood comma with difficulty. There was early bilateral papillœdema an right upper-motor-neurone facial weakness. The ears normal. During the next week the papillœdema seemed increase though *the other signs remained* stationary; diagnosis of temporal lobe abscess was made and on F the brain was needled under local anæsthetic. Only 2 pus could be aspirated (culture: *Staph. aureus*). P (25,000 units) was injected into the abscess cavity. No was felt with the needle.

The patient's speech and other signs rapidly improved she was discharged from hospital on April 1, 1948, *completely recovered. She* went back to her training stage career in the summer of 1948, and at first had diffic in concentrating and learning her lines. Last May she that she had completed her course and had also taken training in acrobatics. An electroencephalogram taken May showed random theta activity in the left temporal but no phase reversal and no spikes.

These last two cases were both diagnosed in the stages and one aspiration and penicillin-replac was all that was necessary.

Case 7.—*Boy aged 7. Fallot's tetralogy. January, 194 short-circuit operation. May, 1948: right frontal lobe absce treated by aspiration. Recovery.*

A short-circuit operation for Fallot's tetralogy was performed in January, 1948, by Mr. R. C Brock. The patient was admitted to hospital again on April 21, 1948, having had two attacks of twitching of the left side of the face which had been preceded by right-sided headache. His lungs were clear *and the only* abnormal sign in the central nervous system a left facial weakness. On April 28 he had a fit which left paralysed on the left side for three hours; but later there a partial recovery of function. He gradually became drowsy and his left-sided weakness developed into a flaccid hemiplegia; he also developed papillœdema and rigidity. A frontal-lobe brain abscess was diagnosed.



—Blood-pressure steady and block allowed to wear off but stituted as blood-pressure rose again. Compare low pulse-ssure with that in fig. 4.

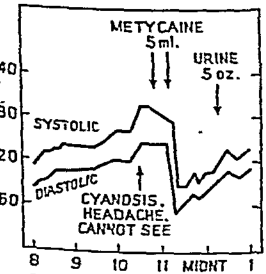
TECHNIQUE AND MANAGEMENT

careful nursing and sedation do not control the l-pressure, other methods must be adopted. Of a lumbar peridural block should be the first choice, spinal and caudal block as second and third choices. eridural block spares the motor nerves, leaving icter control intact and thereby reducing the ing problem. The disadvantage of the caudal block ie difficulty in attaining a satisfactory height of gesia, with consequent unsatisfactory control of the l-pressure.

lumbar peridural block is done with a 16-gauge Tuohy e with the usual aseptic precautions. Through this is ted a length of polythene tubing (no. 1 gauge, external eter 1 mm.) so that the tip comes to lie in the region of 10th thoracic segment. The needle is then withdrawn, ng the tubing in place. The point of entry of the tubing xt sealed with soft-paraffin gauze or sulphonamide oint-, these dressings being firmly anchored with adhesive ping. The free end of the tubing is brought round to the ior abdominal wall and is secured there with a piece of ping throughout its length. Injections may be made the tubing as required. The tubing should be long gh to allow easy access for injection whatever the position e patient.

ie point in the maintenance of asepsis deserves special tion. The free end of the polythene tubing must be ped in sterile gauze after each injection, with the needle u. To prevent leakage and infection it is necessary to seal his end between each injection. If a syringe remains hed and is strapped to the body it will gradually work , and the needle tip will saw through the wall of the ng. This difficulty was overcome by using a needle adapter, se lumen had been sealed with solder, in place of the ige.

r a *spinal block* an identical technique is used, the only rence being in the site of the needle tip. If anxiety is felt about asepsis, a sample of cerebrospinal fluid may be withdrawn from the polythene tubing for examination, and a course of intrathecal crystalline penicillin 10,000 units six-hourly started.



3—Effect of reduction of blood-ressure on excretion of urine.

Our experience in this case supports the view of Hughes et al. (1948), that as a general rule metycaine $1^1/_2\%$ is preferable to longer-acting drugs. Metycaine is effective only for about 45 minutes, and if the level anæsthesia is too high the embarrassment caused will correspondingly brief. Further, since diuresis may be moted by a swinging blood-pressure (Hingson 1949), nay be undesirable to stabilise the blood-pressure at one level for the length of time that a drug such as upercaine' continues to act.

The level of skin anæsthesia furnishes a rough guide the dosage of local anæsthetic required but its assessment requires the coöperation of the patient. The blood-pressure is a more accurate guide and indicates the efficacy of the treatment. The dose of local anæsthetic must be adjusted to obtain the blood-pressure considered most suitable. A constant blood-pressure is least harmful to a damaged heart, so, though a swinging blood-pressure is more effective in promoting diuresis, the blood-pressure must be controlled within limits which the patient's heart can tolerate; for this the pulse-rate and the pulse-pressure are the most satisfactory guides. These criteria are not absolute, however, and there is a constant risk of precipitating acute heart-failure. Fig. 1 shows a swinging blood-pressure culminating in acute heart-failure characterised by cyanosis, dyspnœa, tachycardia, and pulmonary œdema. Fig. 2, on the other hand, covers an earlier period during the same day when the blood-pressure was stable. During the 12 hours covered by fig. 1 22 oz. of urine was excreted, compared with 16 oz. during the 12 hours covered by fig. 2; this may illustrate the contention that urinary output is increased by a swinging blood-pressure.

The immediate effect of a reduction in blood-pressure on the output of urine is seen in fig. 3. For $4^1/_2$ hours no urine had been excreted. When the blood-pressure fell 5 oz. of urine was excreted. This diuresis was a sequel to a precipitate fall in blood-pressure, which had to be combated by supportive measures. The necessity of reducing the blood-pressure to excité the excretion of urine may also become obvious by allowing the block to wear off. When the blood-pressure rose very high, the urinary output appeared to fall progressively.

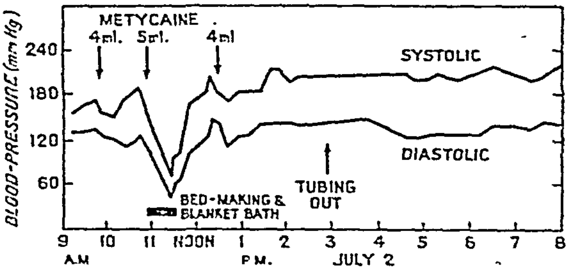


Fig. 4—Blood-pressure remains steady as effect of spinal block wears off. Note hypotensive episode precipitated by bed-making and blanket bath.

In the present case recovery permitted a higher blood-pressure to be maintained without danger. As time went on, it became necessary only to limit peaks in blood-pressure with smaller and less frequent injections. Fig. 4 shows that, when the block was allowed to wear off, the blood-pressure remained steady at about 200/140 mm. Hg and the patient's general condition was satisfactory. There were no visual disturbances, headache, or signs of heart-failure, and diuresis was maintained.

NURSING

The maintenance of a continuous peridural or spinal block should not interfere with normal nursing, but some special points need emphasis.

Blood-pressure and pulse-rate must be recorded frequently, and the patient's general state watched carefully for respiratory embarrassment or the increasing restlessness which often presages a rise in blood-pressure. Patients under a spinal block are intolerant of movement. Fig 4 shows a hypotensive episode precipitated by bed-making and washing. Supportive measures must be to hand to combat crises resulting from movement or from too high a level of anæsthesia. Briefly these measures are tipping the bed, oxygen, and 'Methedrine.' Owing to the pooling of blood in dilated blood-vessels, the raising of both the patient's legs to a right angle with his body is equivalent to an autotransfusion of nearly a litre, and is a valuable manœuvre in attempting to raise a fallen blood-pressure.

Loss of sphincter control under a spinal block necessitates the use of an indwelling catheter. A rectal tube may be interest. Unforeseen problems arise when any new technique is attempted, and the opportunities for applying these methods so seldom arise that, though it is rash to draw conclusions from a single experience, we are prompted to describe this case in the hope that others who wish to use the method may benefit from a report of the difficulties we encountered.

CASE-RECORD

A primipara, aged 21, was admitted to the Radcliffe Infirmary on June 25, 1949, with severe oliguria following delivery of a stillborn child at 35 weeks' gestation.

Her past history was uneventful. Antenatal supervision was carried out at another hospital. The blood-pressure was first recorded at 19 weeks' gestation, when it was 140/80 mm. Hg, and the urine was normal. The blood-pressure remained at 140/80, and, though at 26 weeks the blood-urea was 42 mg. per 100 ml., the pregnancy was regarded as normal until 32 weeks, when the blood-pressure rose to 140/90 without albuminuria. At 34 weeks the blood-pressure was 150/90 and there was albuminuria, so the patient was advised diet and rest. Within three days diarrhœa and vomiting developed, and she was admitted to hospital at 4 P.M. on June 23 in spontaneous labour at 35 weeks. She complained of headache and "seeing stars," her blood-pressure was 190/150, and catheterisation did not produce any urine. Intravenous therapy was started. On June 24 at 4 A.M. the patient was delivered of a stillborn child weighing 3 lb. 10 oz. Sixteen hours after admission $^1/_4$ oz. of urine was obtained by catheter; this specimen contained blood, white cells, and albumin. In the 2 days following admission the patient was given 2 litres of glucose solution and 1$^1/_2$ litres of sodium sulphate solution intravenously, and less than 2 oz. of urine was passed. Intravenous therapy was then abandoned for fear of overloading the circulation, and the patient was transferred to the Radcliffe Infirmary on June 25. There was no history of convulsions.

On admission at 8.30 P.M. the patient was very pale and lethargic, with gross generalised œdema and a bloated and waxy face. Her temperature was 98·8°F, pulse-rate 92 per min., and blood-pressure 170/100 mm. Hg. There was no papillœdema or retinal change. No abnormality was detected clinically in the chest or heart. The fundus uteri was palpable 4 in. above the symphysis; there was bruising of the external genitalia; the lochia were normal; and the breasts showed minimal secretion. Less than 2 oz. of urine had been excreted in the 52 hours since labour started.

Treatment.—The patient was treated on orthodox lines in a darkened room, with a special nurse in attendance. Sedation was begun with diamorphine hydrochloride gr. $^1/_{12}$ and phenobarbitone sodium gr. 3, and maintained with paraldehyde and 'Sodium amytal.' Penicillin 500,000 units six-hourly was given to guard against intercurrent infection. It was considered dangerous to give 'Sulphamezathine' in the presence of such severe oliguria, though the risk of urinary-tract infection was appreciated. Since the Hb was only 61% (Haldane), the packed cells of two pints of blood of the patient's group (group O, Rh-negative) were transfused on June 25, followed next day by the packed cells of a further two pints of blood, since the Hb had risen only to 72%. By 10 P.M., 2 hours after admission, the patient was quiet; 'Polythene' tubing was passed through the nose stomach and an intragastric drip was started, carbohydrate 400 g. and fat 100 g. emulsified in a water. This was continued for eight days, a litre of emulsion being given daily and supplemented by combat excessive loss of fluid by diarrhœa. The pol tubing provoked minimal retching and little vomiting.

PATIENT'S PROGRESS AS SHOWN BY BLOOD AND URINE FINDINGS

Date	Blood					Urine			
	Urea (mg. per 100 ml.)	Plasma-chlorides (mg. per 100 ml.)	Alkali reserve (vol. per 100 ml.)	Plasma-protein (g. per 100 ml.)	Hb (%)	Sp. gr.	pH	Protein (mg. per 100 ml.)	Urea (g. per 100 ml.)
June 25	93	..	..	4·67	62	..	..	..	..
,, 26	80	..	..	..	67	..	..	..	..
,, 27	168	..	..	..	72	..	..	..	..
,, 28	208	565	40	5·4	79	1·010	8·5	400	0·62
,, 29	204	..	28	4·95	66	..	..	..	..
,, 30	218	565	..	4·8	..	1·010	8·5	80	0·8
July 1	208	550	..	4·8	..	1·010	8·5	90	0·72
,, 2	240	540	30	..	..	1·006	8·0	20	..
,, 3	..	..	..	..	..	..	..	..	..
,, 4	240	585	..	5·7	60	..	..	..	1·1
,, 5	..	..	..	..	..	1·006	7·5	50	..
,, 6	280	..	..	..	..	1·008	8·0	40	..

Progress.—At 6 P.M. on June 26, 22 hours after the patient had transient symptoms of cerebral irritation. blood-pressure was 210/140 mm. Hg, and sedation deepened. In the 24 hours after admission 4$^1/_2$ oz of was excreted; this contained 400 mg. of protein per an occasional pus cell, and some red cells. The blood 90 mg. per 100 ml., and the plasma-protein 4·95 g. per On June 27 the blood-pressure remained the same, patient complained of headache and her pulse-rate was Since deep sedation did not lower the blood-pressure, other means was sought.

At 8 P.M. a caudal block was established to the level fifth thoracic segment in the hope of controlling pressure and stimulating diuresis. From this time one of us was in constant attendance. The block was for 22 hours with 'Metycaine' 1$^1/_2$%, with little effect on pressure or urinary output, but with less mental On June 28, with the blood-pressure still 210/140, the became increasingly irrational; she finally lost and there were muscular twitchings of her face limbs.

At this time we were fortunate in having the Dr. Hingson, who suggested a continuous spinal block.

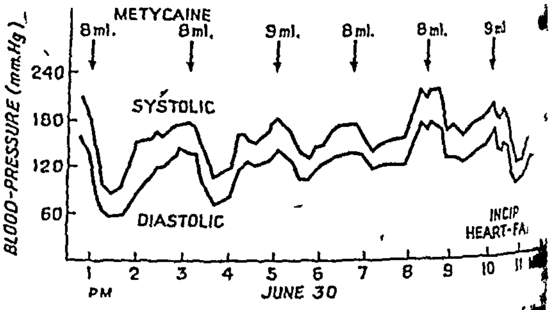
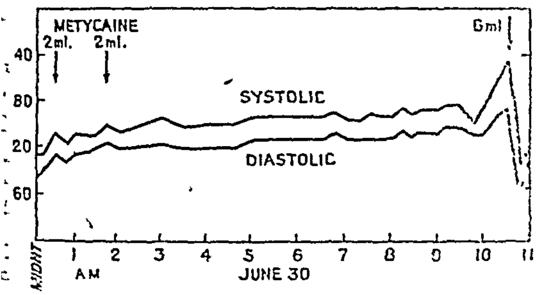


Fig. 1—Swinging blood-pressure culminating in acute heart-fa

soon as the block was established and the blood pr lowered, there was a spectacular change in the pat general condition: consciousness returned and the twitc ceased, though there was no striking increase in ur output. The spinal block was maintained for 4$^1/_2$ da control the blood-pressure. As the block wore off, the bl pressure rose and cerebral disturbance returned. On t occasions incipient heart-failure developed, manifested falling pulse pressure and pulmonary œdema. Each time spinal block was intensified, the blood-pressure fell, and crisis was averted. On the fifth day of block (the seventh after admission) the pulse pressure had increased and blood-pressure had become stable at 200/140 mm. Hg; the block was allowed to wear off. This blood pr though higher than the patient's normal level, did not le heart-failure or cerebral disturbance, and as she seemed fortable the spinal tubing was removed. After the attack of acute heart-failure digitalis and aminophylline given.

The patient's progress gave reasonable prospect of recovery. On clinical grounds the renal lesion was re as probably a lower-nephron nephrosis. Kidney function steadily improving, shown by a urine output rising to than 2 litres a day and a urea excretion rising from le 1 g. per 24 hours on June 26 to 8·5 g. on July 1 and 21. on July 4 (normal up to 32 g. per 24 hours). The ing table summarises the relevant laboratory inv

On July 6 the patient felt very well; she was reading, and demanding a full diet, but becoming of restrictions on her activity. In an unguarded when the nurse left the room to fetch a bedpan, she got of bed; the effort being too much for her, she collapsed died almost immediately. The necropsy findings are and discussed below.



—Blood-pressure steady and block allowed to wear off but stituted as blood-pressure rose again. Compare low pulse-sure with that in fig. 4.

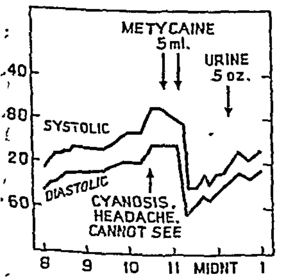
TECHNIQUE AND MANAGEMENT

careful nursing and sedation do not control the l-pressure, other methods must be adopted. Of a lumbar peridural block should be the first choice, spinal and caudal block as second and third choices. eridural block spares the motor nerves, leaving icter control intact and thereby reducing the ng problem. The disadvantage of the caudal block e difficulty in attaining a satisfactory height of gesia, with consequent unsatisfactory control of the l-pressure.

lumbar peridural block is done with a 16-gauge Tuohy e with the usual aseptic precautions. Through this is ed a length of polythene tubing (no. 1 gauge, external eter 1 mm.) so that the tip comes to lie in the region of 0th thoracic segment. The needle is then withdrawn, ng the tubing in place. The point of entry of the tubing xt sealed with soft-paraffin gauze or sulphonamide oint-, these dressings being firmly anchored with adhesive ping. The free end of the tubing is brought round to the ior abdominal wall and is secured there with a piece of ping throughout its length. Injections may be made the tubing as required. The tubing should be long gh to allow easy access for injection whatever the position e patient.

ie point in the maintenance of asepsis deserves special ion. The free end of the polythene tubing must be ped in sterile gauze after each injection, with the needle u. To prevent leakage and infection it is necessary to seal his end between each injection. If a syringe remains hed and is strapped to the body it will gradually work , and the needle tip will saw through the wall of the ng. This difficulty was overcome by using a needle adapter, se lumen had been sealed with solder, in place of the ige.

r a *spinal block* an identical technique is used, the only rence being in the site of the needle tip. If anxiety is felt about asepsis, a sample of cerebrospinal fluid may be withdrawn from the polythene tubing for examination, and a course of intrathecal crystalline penicillin 10,000 units six-hourly started.



3—Effect of reduction of blood-ressure on excretion of urine.

Our experience in this case supports the view of Hughes et al. (1948), that as a general rule metycaine $1^1/_2\%$ is preferable to longer-acting drugs. Metycaine is effective only for about 45 minutes, and if the level anæsthesia is too high the embarrassment caused will correspondingly brief. Further, since diuresis may be omoted by a swinging blood-pressure (Hingson 1949), may be undesirable to stabilise the blood-pressure at y one level for the length of time that a drug such as upercaine' continues to act.

The level of skin anæsthesia furnishes a rough guide the dosage of local anæsthetic required but its assessment requires the coöperation of the patient. The blood-pressure is a more accurate guide and indicates the efficacy of the treatment. The dose of local anæsthetic must be adjusted to obtain the blood-pressure considered most suitable. A constant blood-pressure is least harmful to a damaged heart, so, though a swinging blood-pressure is more effective in promoting diuresis, the blood-pressure must be controlled within limits which the patient's heart can tolerate; for this the pulse-rate and the pulse-pressure are the most satisfactory guides. These criteria are not absolute, however, and there is a constant risk of precipitating acute heart-failure. Fig. 1 shows a swinging blood-pressure culminating in acute heart-failure characterised by cyanosis, dyspnœa, tachycardia, and pulmonary œdema. Fig. 2, on the other hand, covers an earlier period during the same day when the blood-pressure was stable. During the 12 hours covered by fig. 1 22 oz. of urine was excreted, compared with 16 oz. during the 12 hours covered by fig. 2; this may illustrate the contention that urinary output is increased by a swinging blood-pressure.

The immediate effect of a reduction in blood-pressure on the output of urine is seen in fig. 3. For $4^1/_2$ hours no urine had been excreted. When the blood-pressure fell 5 oz. of urine was excreted. This diuresis was a sequel to a precipitate fall in blood-pressure, which had to be combated by supportive measures. The necessity of reducing the blood-pressure to excite the excretion of urine may also become obvious by allowing the block to wear off. When the blood-pressure rose very high, the urinary output appeared to fall progressively.

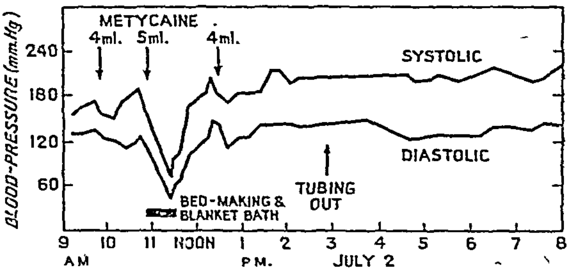


Fig. 4—Blood-pressure remains steady as effect of spinal block wears off. Note hypotensive episode precipitated by bed-making and blanket bath.

In the present case recovery permitted a higher blood-pressure to be maintained without danger. As time went on, it became necessary only to limit peaks in blood-pressure with smaller and less frequent injections. Fig. 4 shows that, when the block was allowed to wear off, the blood-pressure remained steady at about 200/140 mm. Hg and the patient's general condition was satisfactory. There were no visual disturbances, headache, or signs of heart-failure, and diuresis was maintained.

NURSING

The maintenance of a continuous peridural or spinal block should not interfere with normal nursing, but some special points need emphasis.

Blood-pressure and pulse-rate must be recorded frequently, and the patient's general state watched carefully for respiratory embarrassment or the increasing restlessness which often presages a rise in blood-pressure. Patients under a spinal block are intolerant of movement. Fig 4 shows a hypotensive episode precipitated by bed-making and washing. Supportive measures must be to hand to combat crises resulting from movement or from too high a level of anæsthesia. Briefly these measures are tipping the bed, oxygen, and 'Methedrine.' Owing to the pooling of blood in dilated blood-vessels, the raising of both the patient's legs to a right angle with his body is equivalent to an autotransfusion of nearly a litre, and is a valuable manœuvre in attempting to raise a fallen blood-pressure.

Loss of sphincter control under a spinal block necessitates the use of an indwelling catheter. A rectal tube may be convenient if incontinence of fæces is aggravated by a high-fat diet.

Paresis of the legs following a spinal block demands careful attention to prevent foot-drop.

Records.—It was found useful to record all observations, especially blood-pressure, pulse-rate, and fluid balance, on a continuous chart rather than in the form of notes.

Constant Attendance.—A special nurse must be in constant attendance so that the patient is never left unguarded.

DISCUSSION

In adopting this treatment for the present case, it was hoped that there might be a twofold effect—the promotion of diuresis and the control of blood-pressure. Our limited experience of such cases led us first to use a caudal block, which produced neither of these effects; and with the patient's condition deteriorating rapidly, Dr. Hingson advised a continuous spinal block. This controlled the blood-pressure, with a spectacular improvement in the patient's general condition. There was, however, no immediate diuresis. The reason for this may have been that the anuria resulted primarily from angiospasm, causing ischæmia, which led to structural damage of the kidneys owing to the length of time that the condition remain untreated. Even though the reflex spasm was broken when the spinal block was first instituted, a certain time presumably had to elapse before any function could return to the damaged kidneys. Columnar epithelia are known to be able to regenerate, so repair of tubular damage is possible, whereas capillary damage in the complex glomerulus is less rapidly repaired. Even if the spinal block played no part in restoring kidney function, death was undoubtedly averted by the prevention of hypertensive crises. Nevertheless, in numerous reported cases (Hingson et al. 1947) diuresis has immediately followed the institution of a block, and it seems that the briefer the anuria the more striking the response.

In the present case an effective block was only started after four days' almost complete anuria. In retrospect, it seems that a continuous lumbar peridural block should have been instituted in the first place.

Fluid balance (fig. 5) was maintained on the lines advocated by Bull et al. (1949). The rationale is restriction of fluid intake to balance current fluid loss, together with a high-carbohydrate and high-fat diet, which reduces protein katabolism to a minimum. This diet is so unpalatable that it is best given by a continuous gastric drip through the nose. Owing to the massive loss of fluid per rectum, doubtless caused by the combination of a high-fat diet and spinal block, it was thought necessary to supplement the fluid intake with drinks.

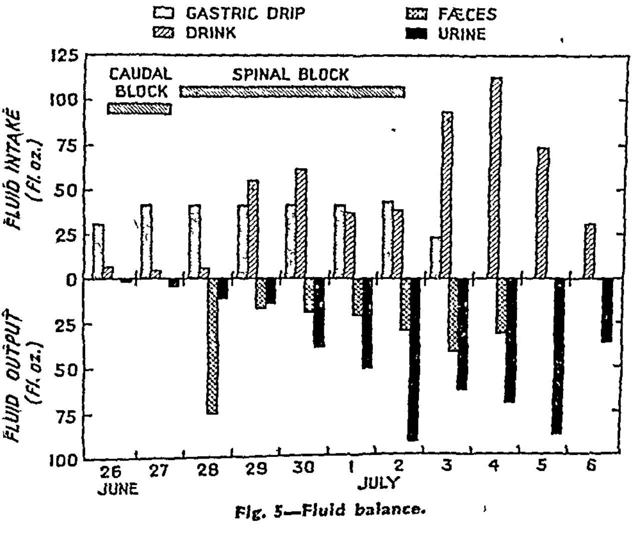


Fig. 5—Fluid balance.

When a rise in blood-pressure was a restlessness, confusion, and headache, this as a warning of imminent heart-failure. R alone could be ascribed to return of sensation as effect of the local anæsthetic wore off. Sedatives prescribed as required.

These cases call for close coöperation between rician, physician, and anæsthetist; but once the phase is over the management becomes a problem.

The unfortunate sequel to the present case is no tion on the treatment described here. Though ultimate prognosis may not have been good, adequate rest and medical treatment this patient reasonably have been expected to survive the As it was, after days and nights of constant att the patient was left for one unguarded moment she seemed to have survived the immediate dangers. that moment she died.

NECROPSY FINDINGS

(R. A. SLADDEN)

Only the more significant findings are mentioned.

Naked-eye Appearances

The heart weighed 450 g., its cavities were not dilated, its muscle was pale and flabby. The lungs showed subp petechial hæmorrhages, and basal congestion of the right The liver weighed 1000 g. and subcapsular and petechial hæmorrhages were present. The right kidney 160 g. and the left 270 g. Both were very pale, with streaky red areas of vascular congestion on the surfaces. The capsules stripped readily. The cut surface rather granular. The cortex was very pale, and a few could be seen with the naked eye in the deeper layers medullary vessels were prominent, but the substance of pyramids was pale and blurred. In the uterus some adhered to the placental site, and there were stromal hæmorrhages in the myometrium. The ovaries showed extensive stromal hæmorrhages. The showed bilateral medullary and cortical hæmorrhages; was distributed in irregular streaks. The other organs appea normal. There was no evidence of infection at the site of caudal and spinal blocks.

Microscopical Appearances

Liver: the hepatic cells were, on the whole, well preserv and showed no increase in fat. There was some dilatation sinusoids and proliferation of Kupffer cells. Focal areas periportal zonal hepatic necrosis were present, with infla matory and hæmorrhagic infiltration. A few afferent hep capillaries showed fibrinoid necrosis, and small fibrin thro were present both in these capillaries and in branches of portal vein. There was slight displacement, but no destructio of the reticulin network.

Kidneys: thick frozen sections were prepared by Fie worth's method to show the distribution of blood. For th most part the cortical vessels contained no erythrocytes though in small focal areas at the periphery the peritubula capillaries were well filled with blood and the glomeruli wer infarcted. In the remainder of the cortex the glomeruli bloodless, except for a few infarcted juxtamedullary glomerul The interlobular vessels were free from blood; the arcuat vessels contained blood and occasional small thrombi; and the vasa recta were engorged and prominent and showed some extravasation of blood. Ordinary sections confirmed this picture of the distribution of blood. The glomeruli showed proliferation of the tufts by endothelial hyperplasia and thickening of the basement membranes. The interlobular vessels were empty and otherwise normal, but subendothelial lymphoid aggregates were seen in some arcuate vessels, which also contained small fibrin thrombi. Vascular changes were most striking in the plexus underlying the pelvic mucosa, where many capillaries showed fibrinoid necrosis. The tubules showed widespread degeneration, but there was also considerable epithelial regeneration. The tubules were widely separated by interstitial œdema, and in places small granulomata had taken the place of destroyed tubular tissue. Hyaline casts, but no hæmoglobin casts, were present in some collecting tubules.

Suprarenals: fibrinoid necrosis was present in the cortical capillaries, together with considerable cortical necro ng chiefly the zona fasciculata. There was wide-spread rhage in both medulla and cortex, and recent thrombi ound in the larger veins of the medulla. The surviving il cells contained abundant lipoid.

itary: pregnancy cells were present, but there was no ice of necrosis.

ent

e histological changes in the liver, kidney, and renal glands are those commonly found in fatal of toxæmia of pregnancy of the eclamptic type. iver lesions, though typical, were not very severe. howed evidence of resolution. The kidney lesions e interpreted as a consequence of vascular changes as may be associated with eclamptic hypertension. e was evidence of epithelial regeneration in the les; yet, if the distribution of erythrocytes as seen ozen sections can be regarded as indicating the ional blood-supply to the kidney, it seems that irculation was largely restricted to the vasa recta e medulla and to a few cortical glomeruli and tubules ring blood from the capsular vessels.

is possible that the vessels underlying the renal c mucosa which showed fibrinoid necrosis—the only vessels observed with this change—were branches e coiled arterial vessels originally described by ner (1937), in which Trueta et al. (1947) noted ing changes in hypertension.

e adrenal damage was severe; so the patient's en death may be attributable to adrenocortical ficiency associated with changes in the myocardium, rbed renal function, and circulatory instability.

are grateful to Dr. Robert Hingson for advice and ance with this case; Mr. J. R. P. O'Brien for biochemical ses; Dr. B. F. A. Swynnerton for untiring assistance in le of physician; and Mr. J. Stallworthy, under whose he patient was admitted to the Radcliffe Infirmary, for ission to publish.

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MOLYTIC ANÆMIA ASSOCIATED WITH HODGKIN'S DISEASE

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SES of severe hæmolytic anæmia associated with gkin's disease are sufficiently uncommon to warrant rding, though the incidence is probably greater the number of reported cases suggests. Davidson 2) described 3 cases, 2 of which were first diagnosed ernicious anæmia because of the macrocytic blood re and treated as such without effect; both of the ents died, and lymphadenomatosis was found at opsy; the third case was diagnosed during life. son (1939) mentioned 3 cases of macrocytic anæmia Hodgkin's disease, and Davis (1944) described hers. In all, 17 cases have been recorded.

xamples of hæmolytic anæmia with reticuloses other Hodgkin's disease have been published. Scott and b-Smith (1939) described 4 cases of hæmolytic anæmia with histiocytic medullary reticulosis, and Gittins (1933) reported a case of reticulo-endotheliosis with hæmolytic anæmia.

CASE-RECORD

An engineer, aged 56, was in good health until January, 1948, when he noted increasing lassitude and small swellings under his chin. His doctor, who saw him on Jan. 17, found enlarged submental and submaxillary lymph-glands, and suspected Hodgkin's disease. Before admission to hospital his hæmoglobin (Hb) was 84% (Haldane). He was admitted ten days later (Jan. 27) as an emergency.

On admission he was well nourished, stuporose, extremely pale, and slightly icteric. Respirations 25 and pulse-rate 120 per min., temperature 99°F, blood-pressure 100/60 mm. Hg. There were enlarged "rubbery" glands in the neck and right axilla. The spleen and liver were not palpable. The urine contained a trace of albumin with an excess of urobilinogen, but no bile pigment.

Blood: red cells 1,250,000 per c.mm., Hb 23% (3·2 g. per 100 ml.), colour-index 0·92, white cells 22,900 per c.mm. (polymorphs 87%, eosinophils 0·5%, basophils 0·5%, lymphocytes 2·5%, monocytes 5%, metamyelocytes 2%, Türk cells 2·5%). The red cells showed well-marked anisopoikilocytosis and polychromasia; 4 normoblasts per 100 leucocytes were found. Reticulocytes 11%. Blood-serum gave a positive direct van den Bergh reaction; serum-bilirubin 7·25 mg.; and blood-urea 65 mg. per 100 ml. Blood-grouping was difficult owing to spontaneous agglutination. The report (abridged) by Dr. W. Weiner, of the Regional Blood Transfusion Service, was: "Spontaneous agglutination occurred. The cells were thoroughly washed and resuspended. The cells were found to be group O and rhesus-positive. The pseudo-agglutination occurred at room, refrigeration, and incubation temperatures. The agglutinates could only be broken up by the addition of saline. A direct Coombs test was weakly positive." There was nothing in the history to indicate any exogenous cause of the hæmolytic process.

Other investigations: Donath-Landsteiner and acid hæmolysin tests were negative. Corpuscular fragility: in the patient, hæmolysis commencing in 0·48% saline and complete in 0·32%; in a control, hæmolysis commencing in 0·44% saline and complete in 0·32%. Radiography of the chest showed no evidence of mediastinal glandular enlargement.

Therapy included penicillin 50,000 units intramuscularly three-hourly and transfusions of fresh blood (packed cells) to the equivalent of $7\frac{1}{2}$ pints in five days. On Feb. 2 the man's Hb was 46%. Five days later it was 34%. Two further pints of fresh blood was given, and his Hb was then 40%. In about a week it had fallen to 25%.

Splenectomy.—The lymph-glands previously described were hardly palpable. Since the patient was destroying blood almost as rapidly as it was given, splenectomy was considered. After a series of blood-transfusions his Hb rose to 64%, and splenectomy was done. The spleen was about twice the normal size and easily removed. It weighed 300 g. (normal 155–200 g.). Microscopically it showed a fine diffuse fibrosis and reticulo-endothelial hyperplasia. The malpighian corpuscles were much diminished in size. Scattered throughout the section were many plasma cells, with occasional polymorphs, eosinophils, and Dorothy Reed cells. The striking feature was the erythrophagocytosis, many of the reticulo-endothelial cells being swollen with pigment giving a positive prussian-blue reaction. There were also some small infarcts. The picture was essentially that seen in an acute hæmolytic anæmia—i.e., dilatation of venous sinuses, with a few red cells and hæmosiderosis—but the pleomorphic cellular appearance with Dorothy Reed cells suggested Hodgkin's disease (fig. 1).

Progress.—The patient remained well, except that about a week later the neck glands, which previously seemed to recede, began to enlarge rapidly, becoming easily visible. The hæmolytic process seemed to have abated somewhat. Fourteen days after operation his Hb was 48%, red cells 2,450,000 per c.mm., colour-index 0·98, and white cells 16,400 per c.mm. (polymorphs 85%, eosinophils 1·5%, basophils 0, lymphocytes 7·5%, monocytes 5%, metamyelocytes 1%).

Lymph-node biopsy on March 12 showed a complete disorientation of lymph-nodal architecture, with diffuse proliferative changes of the medullary elements, diffuse fibrosis, convenient if incontinence of fæces is aggravated by a high-fat diet.

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DISCUSSION

In adopting this treatment for the present case, it was hoped that there might be a twofold effect—the promotion of diuresis and the control of blood-pressure. Our limited experience of such cases led us first to use a caudal block, which produced neither of these effects; and with the patient's condition deteriorating rapidly, Dr. Hingson advised a continuous spinal block. This controlled the blood-pressure, with a spectacular improvement in the patient's general condition. There was, however, no immediate diuresis. The reason for this may have been that the anuria resulted primarily from angiospasm, causing ischæmia, which led to structural damage of the kidneys owing to the length of time that the condition remain untreated. Even though the reflex spasm was broken when the spinal block was first instituted, a certain time presumably had to elapse before any function could return to the damaged kidneys. Columnar epithelia are known to be able to regenerate, so repair of tubular damage is possible, whereas capillary damage in the complex glomerulus is less rapidly repaired. Even if the spinal block played no part in restoring kidney function, death was undoubtedly averted by the prevention of hypertensive crises. Nevertheless, in numerous reported cases (Hingson et al. 1947) diuresis has immediately followed the institution of a block, and it seems that the briefer the anuria the more striking the response.

In the present case an effective block was only started *after four days' almost complete anuria. In retrospect, it seems that a continuous lumbar peridural block should have been instituted in the first place.*

Fluid balance (fig. 5) was maintained on the lines advocated by Bull et al. (1949). The rationale is restriction of fluid intake to balance current fluid loss, together with a high-carbohydrate and high-fat diet, which reduces protein katabolism to a minimum. This diet is so unpalatable that it is best given by a continuous gastric drip through the nose. Owing to the massive loss of fluid per rectum, doubtless caused by the combination of a high-fat diet and spinal block, it was thought necessary to supplement the fluid intake with drinks.

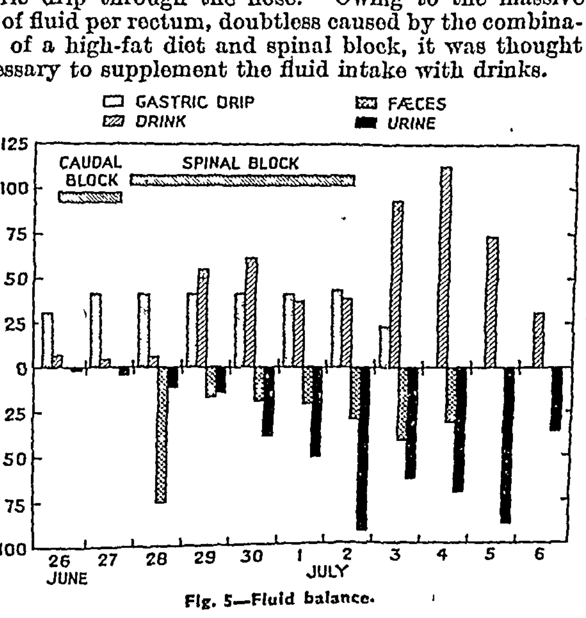

Fig. 5—Fluid balance.

When a rise in blood-pressure was a restlessness, confusion, and headache, this was as a warning of imminent heart-failure. F alone could be ascribed to return of sensation effect of the local anæsthetic wore off. Sedatives prescribed as required.

These cases call for close coöperation between rician, physician, and anæsthetist; but once the phase is over the management becomes a problem.

The unfortunate sequel to the present case is no tion on the treatment described here. Though ultimate prognosis may not have been good, adequate rest and medical treatment this patient reasonably have been expected to survive the As it was, after days and nights of constant at the patient was left for one unguarded moment she seemed to have survived the immediate dangers. that moment she died.

NECROPSY FINDINGS

(R. A. SLADDEN)

Only the more significant findings are mentioned.

Naked-eye Appearances

The heart weighed 450 g., its cavities were not dilated, its muscle was pale and flabby. The lungs showed petechial hæmorrhages, and basal congestion of the right The liver weighed 1900 g. and subcapsular and petechial hæmorrhages were present. The right kidney w 160 g. and the left 270 g. Both were very pale, with streaky red areas of vascular congestion on the surfaces. The capsules stripped readily. The cut surface rather granular. The cortex was very pale, and a few could be seen with the naked eye in the deeper layers medullary vessels were prominent, but the substance of pyramids was pale and blurred. In the uterus some adhered to the placental site, and there were stromal hæmorrhages in the myometrium. The ovaries showed extensive stromal hæmorrhages. The supraren showed bilateral medullary and cortical hæmorrhages; lip was distributed in irregular streaks. The other organs normal. There was no evidence of infection at the site of caudal and spinal blocks.

Microscopical Appearances

Liver: the hepatic cells were, on the whole, well preserv and showed no increase in fat. There was some dilatation sinusoids and proliferation of Kupffer cells. Focal areas periportal zonal hepatic necrosis were present, with infla matory and hæmorrhagic infiltration. A few afferent hep capillaries showed fibrinoid necrosis, and small fibrin thr were present both in these capillaries and in branches of portal vein. There was slight displacement, but no destruc of the reticulin network.

Kidneys: thick frozen sections were prepared by Pi worth's method to show the distribution of blood. For th most part the cortical vessels contained no erythrocytes though in small focal areas at the periphery the per capillaries were well filled with blood and the glomeruli infarcted. In the remainder of the cortex the glomeruli bloodless, except for a few infarcted juxtamedullary glomerul The interlobular vessels were free from blood; the arcua vessels contained blood and occasional small thrombi; an the vasa recta were engorged and prominent and showed so extravasation of blood. Ordinary sections confirmed th picture of the distribution of blood. The glomeruli showed proliferation of the tufts by endothelial hyperplasia and thickening of the basement membranes. The interlobular vessels were empty and otherwise normal, but subendothelial lymphoid aggregates were seen in some arcuate vessels, which also contained small fibrin thrombi. Vascular changes were most striking in the plexus underlying the pelvic mucosa, where many capillaries showed fibrinoid necrosis. The tubules showed widespread degeneration, but there was also considerable epithelial regeneration. The tubules were widely separated by interstitial œdema, and in places small granulomata had taken the place of destroyed tubular tissue. Hyaline casts, but no hæmoglobin casts, were present in some collecting tubules.

Suprarenals: fibrinoid necrosis was present in the cortical capillaries, together with considerable cortical necros ng chiefly the zona fasciculata. There was widespread rhage in both medulla and cortex, and recent thrombi ound in the larger veins of the medulla. The surviving d cells contained abundant lipoid.

itary: pregnancy cells were present, but there was no ce of necrosis.

ent

histological changes in the liver, kidney, and renal glands are those commonly found in fatal of toxæmia of pregnancy of the eclamptic type. iver lesions, though typical, were not very severe. howed evidence of resolution. The kidney lesions e interpreted as a consequence of vascular changes as may be associated with eclamptic hypertension. was evidence of epithelial regeneration in the les: yet, if the distribution of erythrocytes as seen ozen sections can be regarded as indicating the ional blood-supply to the kidney, it seems that irculation was largely restricted to the vasa recta e medulla and to a few cortical glomeruli and tubules ving blood from the capsular vessels.

is possible that the vessels underlying the renal c mucosa which showed fibrinoid necrosis—the only l vessels observed with this change—were branches he coiled arterial vessels originally described by ner (1937), in which Trueta et al. (1947) noted ing changes in hypertension.

e adrenal damage was severe; so the patient's len death may be attributable to adrenocortical ficiency associated with changes in the myocardium, rbed renal function, and circulatory instability.

e are grateful to Dr. Robert Hingson for advice and tance with this case; Mr. J. R. P. O'Brien for biochemical yses; Dr. B. F. A. Swynnerton for untiring assistance in rôle of physician; and Mr. J. Stallworthy, under whose the patient was admitted to the Radcliffe Infirmary, for ission to publish.

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ÆMOLYTIC ANÆMIA ASSOCIATED WITH HODGKIN'S DISEASE

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CASES of severe hæmolytic anæmia associated with odgkin's disease are sufficiently uncommon to warrant cording, though the incidence is probably greater an the number of reported cases suggests. Davidson 932) described 3 cases, 2 of which were first diagnosed pernicious anæmia because of the macrocytic blood cture and treated as such without effect; both of the tients died, and lymphadenomatosis was found at cropsy; the third case was diagnosed during life. atson (1939) mentioned 3 cases of macrocytic anæmia ith Hodgkin's disease, and Davis (1944) described others. In all, 17 cases have been recorded.

Examples of hæmolytic anæmia with reticuloses other an Hodgkin's disease have been published. Scott and obb-Smith (1939) described 4 cases of hæmolytic anæmia with histiocytic medullary reticulosis, and Gittins (1933) reported a case of reticulo-endotheliosis with hæmolytic anæmia.

CASE-RECORD

An engineer, aged 56, was in good health until January, 1948, when he noted increasing lassitude and small swellings under his chin. His doctor, who saw him on Jan. 17, found enlarged submental and submaxillary lymph-glands, and suspected Hodgkin's disease. Before admission to hospital his hæmoglobin (Hb) was 84% (Haldane). He was admitted ten days later (Jan. 27) as an emergency.

On admission he was well nourished, stuporose, extremely pale, and slightly icteric. Respirations 25 and pulse-rate 120 per min., temperature 99°F, blood-pressure 100/60 mm. Hg. There were enlarged "rubbery" glands in the neck and right axilla. The spleen and liver were not palpable. The urine contained a trace of albumin with an excess of urobilinogen, but no bile pigment.

Blood: red cells 1,250,000 per c.mm., Hb 23% (3·2 g. per 100 ml.), colour-index 0·92, white cells 22,900 per c.mm. (polymorphs 87%, eosinophils 0·5%, basophils 0·5%, lymphocytes 2·5%, monocytes 5%, metamyelocytes 2%, Türk cells 2·5%). The red cells showed well-marked anisopoikilocytosis and polychromasia; 4 normoblasts per 100 leucocytes were found. Reticulocytes 11%. Blood-serum gave a positive direct van den Bergh reaction; serum-bilirubin 7·25 mg.; and blood-urea 65 mg. per 100 ml. Blood-grouping was difficult owing to spontaneous agglutination. The report (abridged) by Dr. W. Weiner, of the Regional Blood Transfusion Service, was: "Spontaneous agglutination occurred. The cells were thoroughly washed and resuspended. The cells were found to be group O and rhesus-positive. The pseudo-agglutination occurred at room, refrigeration, and incubation temperatures. The agglutinates could only be broken up by the addition of saline. A direct Coombs test was weakly positive." There was nothing in the history to indicate any exogenous cause of the hæmolytic process.

Other investigations: Donath-Landsteiner and acid hæmolysin tests were negative. Corpuscular fragility: in the patient, hæmolysis commencing in 0·48% saline and complete in 0·32%; in a control, hæmolysis commencing in 0·44% saline and complete in 0·32%. Radiography of the chest showed no evidence of mediastinal glandular enlargement.

Therapy included penicillin 50,000 units intramuscularly three-hourly and transfusions of fresh blood (packed cells) to the equivalent of $7^1/_2$ pints in five days. On Feb. 2 the man's Hb was 46%. Five days later it was 34%. Two further pints of fresh blood was given, and his Hb was then 40%. In about a week it had fallen to 25%.

Splenectomy.—The lymph-glands previously described were hardly palpable. Since the patient was destroying blood almost as rapidly as it was given, splenectomy was considered. After a series of blood-transfusions his Hb rose to 64%, and splenectomy was done. The spleen was about twice the normal size and easily removed. It weighed 300 g. (normal 155–200 g.). Microscopically it showed a fine diffuse fibrosis and reticulo-endothelial hyperplasia. The malpighian corpuscles were much diminished in size. Scattered throughout the section were many plasma cells, with occasional polymorphs, eosinophils, and Dorothy Reed cells. The striking feature was the erythrophagocytosis, many of the reticulo-endothelial cells being swollen with pigment giving a positive prussian-blue reaction. There were also some small infarcts. The picture was essentially that seen in an acute hæmolytic anæmia—i.e., dilatation of venous sinuses, with a few red cells and hæmosiderosis—but the pleomorphic cellular appearance with Dorothy Reed cells suggested Hodgkin's disease (fig. 1).

Progress.—The patient remained well, except that about a week later the neck glands, which previously seemed to recede, began to enlarge rapidly, becoming easily visible. The hæmolytic process seemed to have abated somewhat. Fourteen days after operation his Hb was 48%, red cells 2,450,000 per c.mm., colour-index 0·93, and white cells 16,400 per c.mm. (polymorphs 85%, eosinophils 1·5%, basophils 0, lymphocytes 7·5%, monocytes 5%, metamyelocytes 1%).

Lymph-node biopsy on March 12 showed a complete disorientation of lymph-nodal architecture, with diffuse proliferative changes of the medullary elements, diffuse fibrosis,

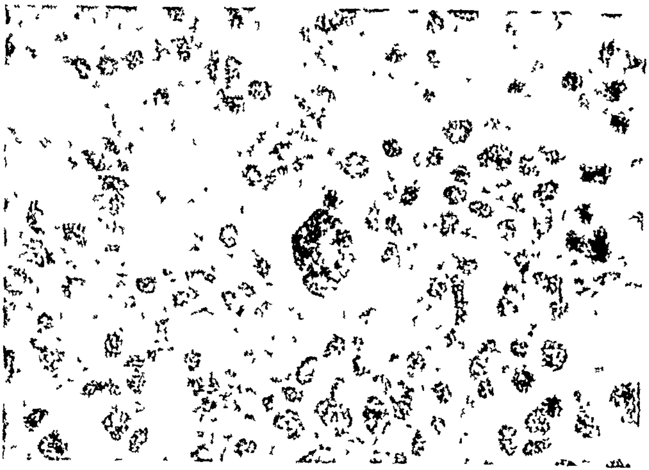

Fig. 1—Spleen showing fine fibrosis, polymorphic infiltration, and giant cell. (× 533.)

and a well-marked *plasma-cell reaction. Occasional* Dorothy Reed cells were present. The picture suggested Hodgkin's disease (fig. 2). On the strength of this report, deep X-ray therapy to the neck, inguinal regions, and axillæ was begun. From March 19 to April 16 a total dose of 10,800 r was given. The result was dramatic, and without further blood-transfusion the man's Hb rose from 54 to 84%. At this time the mean cell volume was 108 c.μ. and mean corpuscular Hb concentration 28%; reticulocytes were 4·2% and platelets 542,000 per c.mm. On April 17, about four months after his admission, the patient was discharged.

Readmission.—The patient continued fairly well as an outpatient until July, when he was readmitted with a recurrence of the hæmolytic process. He now showed signs of congestive cardiac failure, and a large gland was palpable in the left submaxillary region.

Blood: red cells 1,730,000 per c.mm., Hb 34%, colour-index 1, white cells 7950 per c.mm. (unsegmented polymorphs 4%, polymorphs 27·5%, eosinophils 7%, basophils 1%, lymphocytes 40·5%, monocytoid cells 18·5%; 28 normoblasts were seen per 100 white cells. The red cells showed well-marked anisopoikilocytosis and polychromasia. Serum: bilirubin 6 mg. per 100 ml.; van den Bergh, direct negative, indirect positive; spectroscopy showed no methæmoglobin but methæmalbumin was identified.

Next day the patient's Hb was 20%, with red cells 840,000 and platelets 320,000 per c.mm. He died that day; *necropsy* was refused.

DISCUSSION

Davis (1944) states: "In hæmolytic anæmias secondary to the reticuloses, it is not improbable that the abnormal red cell destruction may result directly from phagocytosis by proliferating histiocytes." The obvious criticism of this is that one would expect anæmia to be common in the reticuloses, whereas reverse is true. Possibly the association here is of chance; yet from the history in the present seemed to be a definite correlation between the endothelial hyperplasia and the hæmolytic Certainly, after *splenectomy the hæmolytic* abated, and when this was followed by deep therapy the hæmoglobin level rose spontaneously. *recurrence of the hæmolytic* process was associated further enlargement of glands.

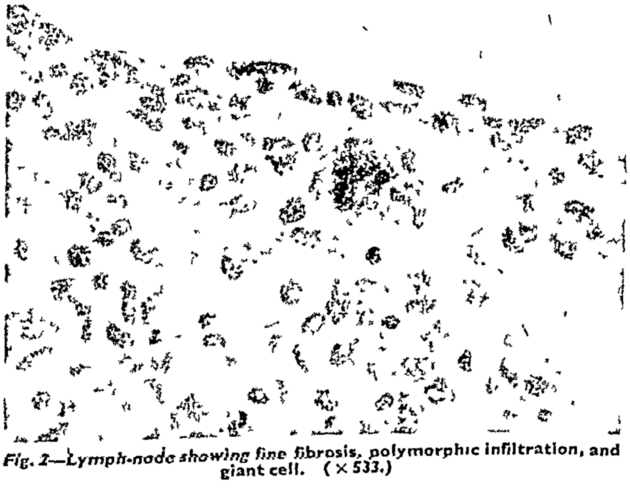

Fig. 2—Lymph-node showing fine fibrosis, polymorphic infiltration, and giant cell. (× 533.)

SUMMARY

A case of severe *hæmolytic anæmia* with a re is described.

Splenectomy depressed the hæmolytic temporarily.

Deep X-ray therapy caused a remission, for three months.

Thanks are due to Dr. J. M. Malins, under whose care patient was admitted, for permission to publish, to R. Gaddie for his biochemical reports; to Dr. J. L for the histological report on the lymph gland, to W. Weiner, of the Birmingham *Regional Blood* T Service, for his report on the serology; and to Miss P Weight for secretarial assistance.

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HEAT CRAMPS

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Ladell, Waterlow, and Hudson (1944), in their inve gation in Iraq, found that 70% of their type I he exhaustion cases complained of cramp. In later te by the Medical Research Council Heat Research Te (Ladell 1947) some subjects had cramp fairly frequent

The factors concerned in cramp were first by Moss (1922) for coalminers. His insistence that was primarily caused by copious drinking of water aft long-continued sweating led Haldane (1923) to that it was a manifestation of water intoxication. from observations at the Boulder Dam and Talbott (1935) concluded that the chief factors we the losses of base, chloride, and water that occur dur heavy sweating; for cramp may occur when water not drunk to excess or even when it is not drunk at all.

It is usually accepted that in heat cramp there always a fall in the chloride content of the blood an plasma. Talbott reported that cramp supervened whe over the plasma chloride fell below 100 m.eq. per lit but other workers gave a lower figure; for examp McCance (1936) found plasma chlorides of less th 90 m.eq. in his *salt-deficient* subjects who develope cramp, and the average plasma chloride concentratio in type I heat-exhaustion cases was 79 m.eq. The observations reported below suggest that water intoxication and chloride loss are equally important.

EXPERIMENTAL OBSERVATIONS

In the Heat Research Team's experiments one subject (W. S. S. L.) was found to be peculiarly susceptible to cramp; he was physically fit and was in every wa normal. Electro-encephalography, both before and after exposure to the heat and after superhydration, showed no unusual cortical activity. This subject was exercised many *times in the heat* solely with the object of producing

›s so that they might be studied more closely; in sts accurate salt and water balances were kept ll 1948), and these are shown in table I.

26 occasions a negative salt balance was incurred; lean negative balance was 21·26 g. ranging from 11 g. On 20 of these occasions the subject complained ımp, which was confirmed objectively by palpation e cramped muscle. On 2 occasions, however, he was nly free from cramp but felt in excellent condition e when he had a negative salt balance of 18 g. and ıot in water debt, and once when he had a negative balance of 29 g. and a negative water balance of ml. On the 4 other occasions where there was a ive salt balance he did not complain of cramp, but eel somewhat exhausted.

the remaining 5 of the 31 tests in which balances were the subject took salt and his negative salt balance very small or negligible; in none of these did he ramp or feel at all crampy. On 6 other occasions ı he exercised in the heat but balances were not he failed to get cramp twice only, once when he taking salt and once when he sweated only about re.

ıese results show that, in this subject, cramps did levelop unless he became salt-deficient to the extent least 10 g., but that he did, at times, become severely deficient without developing cramp. His cramp ed in all important points with those described by ott, McCance, and others. The cramp was always eded by fasciculation of the muscle affected; this culation was similar to, but more pronounced than, twitching seen in a muscle ordinarily fatigued. The ap itself consisted of a localised contraction affecting w muscle bundles only; the cramped bundles could accurately located by the patient, and the hard tracted mass could be palpated by the observer. The le muscle mass was never affected all at one time, as one lot of bundles relaxed, another adjacent lot tracted, giving the impression of the cramp wandering r the muscle.

uring the periods when attacks of cramp could be voked, muscle action currents were recorded by Dr. G. Dawson. It was found that during cramp definite changes occurred which, though not peculiar to this condition, sufficed in the context of these experiments to confirm the subjective complaint of cramp. It was shown that cramp usually followed voluntary contraction of the muscle, but, as pointed out by Talbott, it could be brought on by faradic stimulation. The stimulus had to be repeated several times in rapid succession and to be of moderately high intensity applied at the motor point. Cramp could not be induced, either by voluntary contraction or by faradic stimulations, unless the muscle was allowed to shorten or was already shortened.

LE I—SUMMARY OF EXPERIMENTS ON W. S. S. L. IN WHICH BALANCES WERE KEPT

	Sweat loss (g.)	Balance		Remarks
		Water (g.)	Salt (g.)	
	3988	− 345	−24·85	Cramps during and after exposure
	3846	− 445	−20·66	Cramps during and after exposure
	4889	− 245	−29·23	Cramps during and after exposure
	4409	− 859	−20 67	No record of cramp
	3500	0	−18·0	Subject "easy," not tired
	1030	− 30	− 5·0	Sweating hard. No cramp
	7200	−1470	−28·8	Tired, no cramp. Fingers swollen
	3000	+3000	−15·0	Deliberate overhydration. Severe cramp
	6792	− 370	−34·0	Cramp
	3615	−3470	− 3·5	Felt exhausted, giddy, and shocked. No cramp
	5497	− 957	−21·68	Cramp
	4969	−1869	−22·73	Tired very rapidly. Cramp
	1325	+ 205	− 7·0	Subjective thirst. No cramp
	6000	− 500	−30·0	No record of cramp
5	5170	− 670	−26 0	No record of cramp. Very tired at times
6	4835	−2465	−20·73	Fasciculation, then cramp
7	4963	−5101	− 1·89	No cramp
8	4726	−1276	−20·93	Severe cramp
9	7990	−2340	−17·65	Cramp
0	4205	+ 355	−20·67	Cramp
1	4368	−2368	−20·0	No record of cramp
2	4199	+ 85	−22·75	Exhausted early. Cramp
23	3238	− 138	−16·95	Cramp
24	3574	+ 546	−19·43	Cramp
25	3290	− 250	−16 0	Cramp
26	2200	− 700	−11·0	Minor cramp
27	3880	− 300	−19·0	Fasciculation then cramp
28	4296	+ 87	+ 2·27	No cramp
29	3415	+ 770	−17·0	Cramp
30	3740	+1780	−19 0	Fasciculation and minor cramp
31	4690	+1420	−24·0	Fasciculation and early cramp. Grey vision

TABLE II—CHANGES IN CHLORIDE BALANCE, BODY WATER, EXTRACELLULAR FLUID, AND INTRACELLULAR FLUID. FIGURES IN BRACKETS GIVE NUMBER OF EXPERIMENT ACCORDING TO TABLE I (MODIFIED FROM LADELL 1949)

Experiment no.	Calculated change in			
	Chloride balance (as NaCl) (g.)	Body water (litres)	Extracellular fluid (litres)	Intracellular fluid (litres)
(a) Chloride losses not replaced				
1 (11)	−21·68	−0·957	−2.936	+1·979
2 (12)	−22·73	−1·869	−2.257	+0·388
3 (16)	−20·73	−2·465	−2·137	−0·328
5 (18)	−20·93	−1·276	−2·620	+1·344
6 (20)	−20·67	+0·355	−2·618	+2·973
7 (22)	−22·75	+0·085	−2·871	+2·956
8 (23)	−16·95	−0·138	−1.778	+1·640
9 (24)	−19·43	+0·546	−1·583	+2.129
11	−18·17	+0·047	−2·110	+2·157
12	−15·21	−3·829	−2,924	−0·905
14	−19·35	+0·324	−2·708	+3.032
18	*−16·57*	−3,288	*−3·179*	*−0,109*
24	−19·87	−0·139	−2·285	+2·146
25	−12·74	−3·001	−2·763	−0·238
26	−13·79	−0·118	−1·528	+1·410
28	−20·34	−0·214	−2.447	+2·233
30	−14·29	−3·345	−2·871	−0·474
(b) Chloride losses replaced				
4 (17)	−1·89	−5·101	−1·247	−3·854
10 (28)	+2·27	+0·087	+0·321	−0·234
13	−3·68	+0·118	−1·659	+1·777
15	−3·60	−0·477	−0·227	−0·250
20	−3·12	+0·514	+0·055	+0·459
21	−2·62	+0·651	−0·445	+1·096
22	−2·61	+0·633	+0·310	+0·323
23	−2·21	+0·426	−0·272	+0·698
27	−0·99	−0·356	+0·311	−0·667
29	−2·41	−0·181	+0·058	−0·239

In 10 of the tests on the "cramp" subject, and on other occasions on other subjects, blood samples were taken before and after exposure to the heat, to estimate the chloride content of the blood and of the plasma (Ladell 1949). By applying the formula of Elkinton and Winkler (1944) to the water and salt balances and to the changes in the plasma chloride, it was shown that when salt was not replaced there was a flow of body water from the extracellular into the intracellular compartments, giving rise to intracellular overhydration: but when salt was replaced this did not occur (see table II).

When a severely salt-deficient subject did not develop cramp, he usually became puffy and œdematous towards the end of his exposure to the heat, suggesting that water was retained extracellularly, and that the intracellular fluid had not been diluted. A similar puffiness was seen in those who received large intramuscular injections of DOCA (desoxycorticosterone acetate) (Ladell 1945b). Though DOCA reduced the chloride losses in the sweat, the subjects were still able to incur considerable negative salt balances, yet none of them, even the cramp-susceptible, developed cramp when under the influence of DOCA. Subjectively, after DOCA, men felt better able to work in the heat and less tired than usual; they also felt fitter on those occasions when, without DOCA, they were overhydrated and under-salted but did not get cramp. We were unable to demonstrate objectively this improved ability to work after DOCA or in the "failed cramp" tests.

RELIEF OF CRAMP BY CHLORIDE

Clinically it is well known that heat cramp may be promptly relieved by giving salt. The following experiment showed that this relief is very rapid.

The cramp-susceptible subject exercised in the heat (dry-bulb temp. 100°F, wet-bulb temp. 94°F) for 120 min. He sweated 4720 ml., losing in his sweat 20·84 g. chloride as sodium chloride. He had been allowed to drink, and his negative water balance was only 1276 ml., but no salt had been replaced. At the end of the 120 min. he was complaining of cramp in both calves and in both thighs.

A pneumatic tourniquet was then placed above the right knee and inflated to a pressure of 250 mm. Hg, when pulsations in the dorsalis pedis artery on that side were no longer palpable. (Control experiments had shown that vascular occlusion for periods up to 35 min. did not itself bring on cramp in a subject not already exhibiting it.) The tourniquet was left in position inflated for 33 min. After 25 min. of vascular occlusion cramps could still be produced by voluntary contraction and demonstrated objectively even though the leg had become numb. After another 8 min.—just before the tourniquet was released—there was a loss of appreciation of pinprick over the toes and dorsum of the foot, and abnormal sensation up to the junction of the upper and middle thirds of the lower leg. By this time voluntary contraction was no longer possible, but electrical stimulation of the shortened muscle gave rise to a sensation of cramp, which could not be confirmed objectively.

At a time when the tourniquet had been in position and inflated for 15 min., and while cramps were present in both legs, 162 ml. of 15% sodium chloride solution, sufficient to cover the estimated salt loss, was injected into the right basilic vein over a period of $3^1/_2$ min. After the injection was completed efforts were made to induce cramp in both legs. From 2 min. after the end of the injection cramp could not be detected in the left calf, either subjectively or objectively; but, as already related, it was detectable in the right, occluded, leg for a further 7 min. It disappeared from the right leg 3 min. after the occlusion was released.

During this experiment, blood samples were taken before and immediately after exposure to the heat, and immediately before and after injection of the saline; the chloride contents of the whole blood and of the plasma from these samples were estimated and the changes in the fluid distribution in the course of the test calculated. The results, given in table III, show that the cramp was relieved when there was still some overhydration of the intracellular spaces.

TABLE III—CHANGES IN BLOOD AND PLASMA CHLORIDE A FLUID DISTRIBUTION DURING EXPERIMENT FOR THE OF CRAMP. SUBJECT W. S. S. L. EXPOSED TO HEAT FROM 25 to 145 MIN.; 15% SODIUM CHLORIDE INJECTED AT MINUTES

Time (min.)	Chloride content of		Calculated change in			
	Blood (m.eq/l)	Plasma (m.eq/l)	Salt balance (g.)	Water balance (litres)	Extra-cellular fluid volume (litres)	ce to' flu
0	78·9	99·0	0	0	0	0
25	..	..	0	0	0	0
145	..	..	−20·93	−1·276	..	..
160	74·1	92·1	..	..	−2·620	+1
205	72·9	90·0	−22·67	−0·72	−2.46	+1
220	90·9	111·2	+1·95	−0·57	−1·45	
Next day	85·5	98·7	..	..	..	.

DISCUSSION

This work suggests that two main factors are involved in the causation of heat cramp.

Cramp occurs when there is intracellular overhydration, similar to the overhydration observed by Danowski et al. (1946) in salt-deficient dogs which developed the convulsions of water intoxication. Generalised overhydration, however, does not necessarily cause cramp; this was shown by those tests in which subjects were treated with DOCA and could not develop cramp, and also on those occasions when the subjects had drunk large quantities of water, had taken no salt, but did not complain of cramp. If heat cramps in man are analogous to the convulsions of water intoxication in animals, these observations are comparable with those by Liling and Gaunt (1945) that suprarenal cortical hormones protect against water intoxication in animals. Moreira et al. (1945) showed that a natural cortical hormone reduces the chloride losses in the sweat, and this has also been reported for DOCA (Ladell 1945b); so the occasional non-susceptibility of subjects in negative salt balance and generally overhydrated might be due to increased activity (for some reason) of the suprarenal cortex, resulting in a saving of chloride, and giving this hypothetical protection. A possible mode of action of the cortical hormones might be the slowing down of the fluid transfer from extracellular to intracellular spaces that takes place when there is salt deficiency underhydration. That accumulation of extrac fluid does occur after the administration of DOCA i known and is shown by the œdema that dev (cf. Ladell 1945b).

The second important factor is chloride loss, absolute or relative. Cramp has not been observed the blood and plasma chloride contents have not reduced, or when the salt losses have been made g The suppression of diuresis that occurs in some su on exposure to the heat (Weiner 1945) tends to the relative salt loss, especially when the chloride co of the sweat is high. In the experiments described a man might lose 2 litres of sweat containing 0· NaCl; he would thus have a negative chloride b of 9 g. As this amount of sodium chloride is cont in 1·5 litres of body water, his water deficiency (rel to sodium chloride) would be only 0·5 litre, and as as he drank and retained more than this amount of he would dilute his body fluid. The relief of cr following the restoration of the blood and pl chloride to the normal level by the injection of conc trated saline was very rapid and complete, even tho intracellular overhydration apparently persisted; possibly sodium chloride has a specific effect on cram

Unless there is both intracellular overhydration a diminution in the chloride content of the tissue cramp does not occur. Usually the former is the of the latter, so the two are associated; but when they are dissociated cramps are not found. Such dissociation was seen after DOCA and in the experiment for the rapid relief of cramp. Clinically also there may be a lowered plasma chloride without cramp, as in type II heat exhaustion, when the mean plasma chloride was 86·8 m.eq. per litre. Taylor (1944) also depleted subjects of salt but none developed cramp; his depletions not, however, extreme, but only to a mean level, in plasma, of 96 m.eq. per litre.

Subsidiary factors in heat cramps, as pointed out Moss and others, are fatigue and acclimatisation. muscle may go into cramp, but the fatigued muscle more susceptible. The acclimatised individual is le liable to cramp, first because he is less easily fatigued; secondly because the salt losses in his sweat are le (Ladell 1945a, Conn et al. 1946), and hence, for the same work and exposure, the diminution in plasma chloride less; and thirdly because the muscles themselves appear to become more tolerant of cramp-producing conditions. An intensity of fatigue and amount of salt loss sufficient to induce severe cramp in a man when unacclimatised will induce only very mild indications of cramp in the same man when he is fully acclimatised. In view of the subjective improvement in performance after DOCA this may be another manifestation of suprarenal cortical activity.

all in the plasma chloride makes muscles susceptible amp. When the blood-supply to a muscle mass was ded the restoration of the chloride content of the elsewhere did not affect the cramp in the occluded le; thus the initiation of cramp is probably local peripheral. But Dawson (personal communication) suggested that the actual development of cramp ads on the integrity of the spinal reflex arc.

SUMMARY

ere is an analogy between heat cramp in man and r intoxication in animals. Both occur when there racellular overhydration.

at cramp does not occur, however, unless at the time the chloride content of the body fluid is nished. This diminution need only be local.

ere is some evidence that the suprarenal cortical ione may protect against heat cramp.

is work was done in the Neurological Research Unit of Medical Research Council, at the National Hospital, n Square, under the direction of Dr. E. Arnold Carmichael, e advice and suggestions throughout have been invalu- I am indebted to Dr. G. Dawson for his coöperation and is permission to refer to work by him on this subject, and e his opinions. I am grateful to Dr. W. A. H. Rushton, ., for his suggestion of the experiment to demonstrate rapid relief of cramp, and to Dr. G. F. Loutit for ins tance in this experiment.

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PHYXIA AND SHOCK IN THE NEWBORN

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ASPHYXIA neonatorum is one of the commonest causes stillbirth. Dunham (1932) and Tandy (1933) main- n that it is the dominant cause, and Macgregor (1946) orted that 37·2% of stillbirths in her series were due asphyxia.

Apparently no clear record of post-mortem findings in is condition has been published. Almost all articles the subject deal with statistics, with only fleeting ferences to the pathology. These brief references gest that the condition varies greatly in its mani- stations; asphyxia, so called, seems to arise in very ried circumstances and commonly with no evident lation to preceding events. It has been reported in nnexion with normal vertex deliveries, forceps deliveries, ternal and external version, cæsarean section, accidental æmorrhage, placenta prævia, hypertensive toxæmia. nd eclampsia—in fact every conceivable obstetric con- lition. Similarly, shock is seldom mentioned in relation o stillbirths, which is curious in view of the importance ttributed to birth injury. It is perhaps noteworthy hat, according to Baird (1942), in 1939 the Registrar-General for Scotland could find no satisfactory cause for death in 37% of all stillbirths.

MATERIAL

An attempt has been made to define the changes in stillbirth associated with shock and asphyxia. Over nine months about 400 necropsies were performed at the Glasgow Royal Maternity and Women's Hospital on cases of stillbirth and neonatal death. From these, 116 stillbirths have been selected. According to the post-mortem picture these appeared to form three distinct groups.

GROUP 1

In the first group, accounting for 30 of the 116 cases, the child most commonly presented at birth the appearances of asphyxia pallida. Often, however, there were irregular patches of slight cyanosis on the face and limbs.

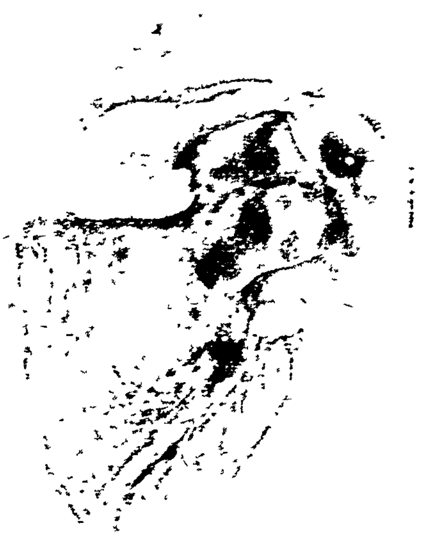

Fig. 1—Heart from a case in group 1, showing gross hæmorrhage along the atrioventricular sulcus and especially on the great vessels.

The pectoral muscles were usually pale, but occasionally they contained patches of hæmorrhage. In a few cases hæmorrhage was also found in the anterior mediastinal tissues and on the parietal pericardium.

The myocardium was commonly pale, but sometimes showed an irregular patchy congestion. In many of these cases, however, the most striking feature was hæmorrhage, forming a broad band along the atrioventricular sulcus on the posterior aspect of the heart, and commonly extending on the right side to the anterior surface and downwards along the coronary vessels to the apex. The coronary arteries were generally empty, but the accompanying veins were commonly distended with blood. In some cases hæmorrhage was more diffuse, arising in patches over the surface of the right ventricle. Hæmorrhages were also seen on the adventitial coat of the ascending aorta (fig. 1). Very little blood was found in the cavities of the heart. In a few cases tiny subendocardial hæmorrhages were found on the medial wall of the left ventricle a little below the aortic valve.

The thymus showed typical changes. It was always pale but often spotted with small round distinct hæmorrhages (fig. 2). The lungs were almost invariably cyanosed and had sometimes collapsed against the vertebral column. The pleural cavities frequently contained a little excess of fluid, and on the visceral surface there were numerous hæmorrhages in the form of either fairly large flame-shaped patches or a diffuse close-set rash of tiny petechiæ giving a rather "tabby-cat" appearance to the organ. Small hæmorrhages in the substance of the lungs were also common. Hæmorrhage was sometimes present beneath the parietal pleura on the diaphragmatic surface, and similar effusions of blood were found on the under surface of the diaphragm and along the ligamentum teres.

The liver parenchyma was usually rather pale, but in some cases there was subcapsular congestion with superficial hæmorrhages mainly on the upper surface.

The spleen was small, but showed little change on naked-eye examination, though in a very few cases intracapsular hæmorrhages similar to those on the liver were present.

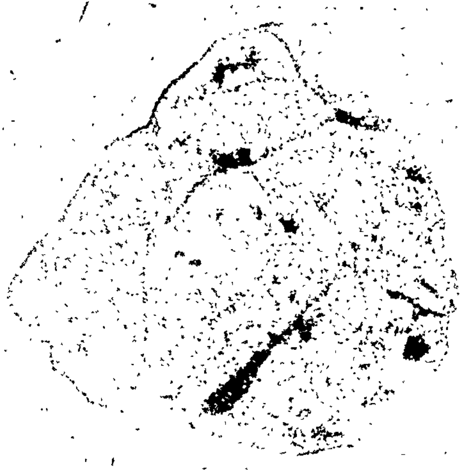

Fig. 2—Thymus from a case in group I, showing general pallor and discrete hæmorrhages.

The adrenal glands presented a variety of appearances. Most commonly the cortex was very pale brown and seemed to contain none of the usual yellow and rather refractile lipoid, while the medulla was grey. In a few cases capillary hæmorrhages were seen in the cortical tissue, while in others yellow lipoid was present as a thin subcapsular band and there was congestion of the deeper cortical zones.

A rather similar variation of the vascular pattern was found in the kidneys. Commonly there was generalised pallor of both cortex and medulla, but in many the medulla was relatively congested and the juxtamedullary zone of the cortex definitely so. In others tiny hæmorrhages were present just beneath the capsule.

Usually little change could be seen in the intestines or peritoneal cavity; in some cases there was a small excess of fluid, and in a very few there were petechial hæmorrhages on the serous surface of the bowel. The colon was distended with meconium.

The brain was usually pale and œdematous. Tentorial tears with varying amounts of subdural hæmorrhage were found in a third of the cases, but the hæmorrhage was severe in only a single case. Slight subarachnoid oozing over the cortex was found in 6% of cases. In most, however, no gross cerebral injury could be found.

Antepartum hæmorrhage, which occurred in 14 of the 30 cases in this group, appeared to be the most common associated factor. In 13 the hæmorrhage was accidental; in only 1 was it due to placenta prævia. In 9 cases there had been malpresentation, corrected by internal version, with delivery manually or by forceps. In another 7 the child was delivered by forceps, but in each instance the pregnancy was complicated by toxæmia. There were 8 premature births in this group; the post-mortem appearances did not vary from those already described.

GROUP 2

A very different appearance was presented by stillborn children of the second group. Here there was pronounced general cyanosis, with œdema of the face in some cases.

The pectoral muscles were congested, but there was no sign of hæmorrhage either in these or in the mediastinum. Congestion of the myocardium was extensive, but there was no epicardial hæmorrhage. The right side of the heart was usually engorged with blood, but otherwise the heart appeared normal.

In the thymus no gross abnormality, apart from congestion, was found.

The lungs were bulky and cyanosed. The lung substance was firm; the edges of the lobes were usually sharp, and fœtal lobulation was absent. Occasionally a few superficial petechiæ were found on the pleural surfaces.

There was severe congestion of the abdominal organs, including the liver, spleen, and kidneys. Hæmorrhage was infrequent, and the congestion was generalised—not confined to one part of the organ as in the first group. Thus in the kidneys both the cortex and medulla were congested, and indeed the cortex was the more congested of the two

The adrenals showed intense congestion of the
and inner cortex with occasional small hæmorrhages;
was reduced to a very thin and patchy layer just
capsule.

There was well-marked congestion of the brain
meninges. In about 40% of cases tentorial tears were
but hæmorrhage was not found in any significant
The vein of Galen was distended in every case but one,
the subdural hæmorrhage was a little more extensive.

Of the 24 cases in this group, death in 13 appeared
be due to an abnormality of the cord—such as
wound tightly several times round the neck, p
and compressed cord, and short cord with traction
throughout labour. In 5 death was due to oc
the trachea by aspirated vernix or meconium or
plug of mucus. In 6 there had been delayed labour
was allowed to proceed without interference; 2 of
were associated with malpresentation, while each
remaining 4 was the second of twins. Maternal to
was present in 5 cases, but did not appear to bear
direct relation to the cause of death. All of
babies were mature.

GROUP 3

Most of the cases (62) fell into the third group,
seemed to have features in common with both the
two. The child was always cyanosed at birth
occasionally had a petechial rash on the sk
often on the neck and chest.

Hæmorrhage into the anterior mediastinal tissues
common. The myocardium was patchily congested
pronounced distension of the veins. A band of h
similar to that seen in group 1 was present along the p
atrioventricular sulcus, extending anteriorly to the
ventricular line, and then passing down to the apex of
heart. Hæmorrhages were also present on the ascending
up to the reflection of the pericardium. The right side of
heart was usually distended with blood. In a few
subendocardial hæmorrhages were found in the left v

Punctate hæmorrhages were present on the thymus,
was grossly congested.

As in the other groups, the lungs were cyanosed. P
hæmorrhages, similar to those in the first group, were nu
ous. The lungs were bulky and firm and intrapu

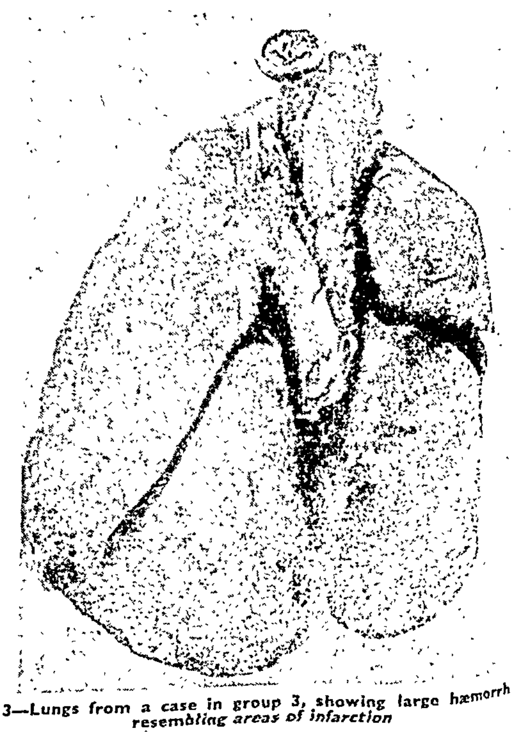

Fig. 3—Lungs from a case in group 3, showing large hæmorrh
resembling areas of infarction

rhages resembling infarcts were com- fig. 3). The air-passages sometimes ied a bloodstained discharge, which ry occasionally seen at the nostrils. eural cavities contained a little excess ous fluid, and there were hæmorrhages diaphragmatic surface.

liver was very congested, and hæmor- occurred in two forms: (1) commonly ge blood bullæ raising the capsule the underlying parenchyma, which ases had ruptured with a subsequent peritoneum: and (2) occasionally as use rash of petechial hæmorrhages th the capsule. Sometimes both types morrhage were seen.

capsular petechiæ were also found in pleen, and hæmorrhages in the splenic gave the organ a slightly nodular rance.

the adrenal glands medullary and rtical congestion associated with capil- hæmorrhage was pronounced, and in s an apoplectic appearance was evident. d appeared to be scanty or absent.

e kidneys were usually congested, but the congestion was ionally confined to the medulla and juxtamedullary ns; cortical hæmorrhages were common (fig. 4).

e intestines were congested and in a few cases petechiæ found on the serous surface of the small intestine. An s of straw-coloured fluid was present in the peritoneal y.

27 of the 62 cases there was no structural change in the or meninges. In all the cases the brain was very wet there was an excess of cerebrospinal fluid; many showed estion of the intracerebral vessels. Tentorial tears were ent in 20 cases; but in 12 of these hæmorrhage was nt, indicating that the tears had probably occurred post tem. This suggests that in this group tentorial tear is not rimary importance. In 9 instances subarachnoid hæmor- e occurred. This was always over the vertex: sometimes as diffuse, but commonly it took the form of small discrete e-shaped effusions from the superficial vessels. Gross aventricular hæmorrhage was found in 2 cases, and in a there were hæmorrhagic blebs beneath the ependyma on wall of the lateral ventricles. Of the remaining cases, ad been subjected to craniotomy and the 3rd was ncephalic.

n the mother the commonest complicating factor in s group was toxæmia, including eclampsia and acci- ital hæmorrhage; this arose in 54% of cases. Maternal ck was the next most common complication; in 20 es this was due to accidental hæmorrhage, in 5 to centa prævia, and in 2 to ruptured uterus. Eclampsia urred in 4 cases. Prolonged labour was often a ominent feature, but this was always associated with ne other factor such as toxæmia, antepartum hæmor- age, difficult forceps delivery, or cæsarean section. this group there were 16 premature babies, of whom weighed less than 4 lb. Prematurity, however, did t seem to influence the post-mortem appearances. In onatal deaths cerebral hæmorrhage appears to be rticularly associated with prematurity, but in this oup of stillbirths only 2 of the 9 cases with sub- achnoid hæmorrhage were born prematurely. Of the infants with hæmorrhage in or around the ventricles, was mature.

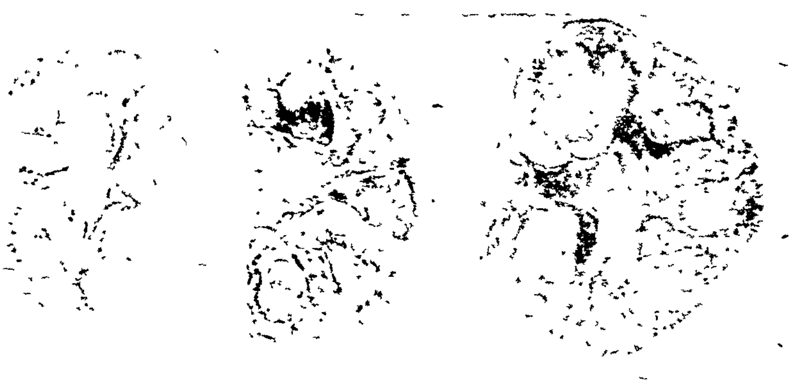

Fig. 4—Kidneys representative of the three groups. On the left is a kidney from a case in group 2, showing generalised congestion, especially marked in the cortex. The kidney in the centre is from a case in group 1, showing generalised pallor with relative congestion of the medulla. The kidney on the right is from group 3 and shows cortical hæmorrhages in addition to general congestion.

DISCUSSION

There seems little doubt that the cases of group 1 had uffered mainly from shock. The post-mortem appear- inces correspond to those described as the lesions of hock in adults and in animals.

Over fifty years ago Bardeen (1896) described hyper- æmia of internal organs, œdema of soft tissues, and petechiæ on serous surfaces in cases of severe burning. The appearances of clinical and experimental shock have been described in detail by Moon (1936, 1938, 1942a and b, 1944) and his associates. The changes they found consisted of somatic pallor, hyperæmia of internal organs, œdema, effusions into serous cavities, and hæmorrhages on serous surfaces. When death followed soon after the onset of shock the main changes were gross hyperæmia of internal organs and hæmorrhages, whereas when death was delayed for 24 hours œdema and serous effusions were prominent. Similar findings have been reported by Selye (1946).

In recent studies on shock special attention has been paid to the adrenals. Popják (1944) produced shock in rats by prolonged application of a tourniquet and found that the adrenals lost their yellow cortical lipoid and became greyish-brown. According to Selye (1937) this is typical of the initial stages of shock. It is significant that this was a common finding in group 1 of the present series. Moreover, subendocardial hæmorrhages were found in this group and according to Sheehan (1939, 1940) these are a reliable indicator of a shock-like condition, at least in obstetric cases. Similarly, Sheehan (1939) described intrapulmonary hæmorrhages in obstetric shock. Burt (1942) believes that asphyxia pallida is undoubtedly a condition of shock.

With regard to the second group, little comment can be made on the pathological findings. The picture is that of acute passive congestion, which may result from right-sided cardiac failure. The expanded lung suggests that an unavailing attempt at respiration has been made. The ultimate phase of de-oxygenation would undoubtedly lead to cardiac failure and thus cause venous congestion.

In the third group there appears to be a combination of asphyxia and shock. The widespread hæmorrhages suggest something more than passive congestion; and the hæmorrhages were found in the same sites as in group 1. Nevertheless, the peripheral cyanosis and the congestion of the spleen are not features of uncomplicated shock and correspond rather to the appearances in venous congestion in adults.

SUMMARY

The post-mortem appearances in 116 stillbirths are classified in three groups.

The appearances in group 1, where signs of asphyxia pallida were present at birth, correspond to those described in relation to shock in adults and experimental shock in animals.

The main feature in group 2 is acute venous congestion, which seems to be compatible with intra-uterine asphyxia.

In group 3 the findings suggest shock complicated by asphyxia or vice versa.

This classification may aid in the analysis of stillbirths, and it may be possible to assess the effect of obstetrical

abnormalities and of obstetrical manœuvres on the prognosis for the child.

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FATAL ASPHYXIA FROM INTRATRACHEAL RUPTURE OF A TUBERCULOUS MEDIASTINAL LYMPH-GLAND

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OF the acute episodes that may punctuate the course of tuberculous intrathoracic infection in childhood, one of the rarest is asphyxia due to rupture of a caseous tuberculous lymph-gland into the trachea. In the case reported here we were present when the rupture took place.

CASE-RECORD

A boy, aged 6 years, was admitted to the Royal Liverpool Children's Hospital from the outpatient department with a history of cough, anorexia, and loss of weight. During the preceding three days he had complained of pleuritic pain in the right side of his chest and the cough had become worse. His development had been normal and he had not had any serious illnesses. There had been no known contact with any case of tuberculosis.

Examination and Treatment.—The boy looked pale and acutely ill, and his temperature was 101·4°F. Signs of consolidation were found over most of the right lung, and the spleen was just palpable. A chest radiograph showed consolidation of the lower part of the right lobe and the middle lobe, and partial consolidation of the lower lobe; the left lung appeared to be normal. White-cell count 14,500 per cmm. (polymorphs 84%, lymphocytes 13%); hæmoglobin 10·8 g. per 100 ml. (alkaline hæmatin method). He was given sulphadimidine ('Sulphamezathine') for a few days, without clinical improvement. A Mantoux test (1 in 10,000) proved positive, and he was regarded as a case of tuberculous consolidation of the right lung, probably associated with some pulmonary collapse though this was not demonstrable in the radiograph. Repeated gastric lavage did not reveal tubercle bacilli, and both culture and guineapig inoculation of gastric contents were negative. The cerebrospinal fluid was normal, and the corrected erythrocyte-sedimentation rate (E.S.R.) (Wintrobe) was 22 mm. in the first hour.

Progress.—After three weeks' rest in bed he seemed better: his appetite had returned; he had gained weight; and his cough was less troublesome. Further radiographs of the chest showed some extension of the consolidation in the right lower lobe, but later the shadows in the upper and lower lobes began to clear, the appearance of the middle lobe remaining unchanged; some thickening of the interlobar pleura could be seen. In none of the many radiographs could enlarged mediastinal glands be demonstrated.

After two months' treatment in the medical ward the patient's general condition had further improved and it was decided to transfer him to a convalescent hospital. There remained some impairment of the percussion-note over the right middle and lower lung zones, but air-entry was quite good; there had been practically no change in the radiographic appearance of his chest during his last month in hospital. The E.S.R. was still 21 mm., but the hæmoglobin had risen to 13 g. per 100 ml. Leucocytes now numbered 10,000 per c.mm. (polymorphs 60%, lymphocytes 32%).

Terminal Episode.—One morning, shortly before the was to be transferred, he stood up in bed, coughed, began to cry. He was extremely dyspnœic and became deeply cyanosed. His respirations were slow, and laboured, with prolonged inspiration and expiration, there was some wheezing. The ward nurse had noticed that morning that he had developed a short paroxysmal

On examination, breath sounds could be heard quite on the right side of the chest, but on the left side resonance had developed and breath sounds were To exclude spontaneous pneumothorax a needle was into the left pleural space—without result—and it evident that he had an acute obstructive emph. Rupture of a tuberculous gland into a main bronchus, ball-valve obstruction, was diagnosed tentatively. One (W. M. L. T.) passed a laryngoscope and noted that there no obstruction in the larynx; but it was impossible to duce a bronchoscope into the trachea owing to spasm vocal cords. All this time the child's condition was ext grave; he was grossly cyanosed and his pulse and resp were feeble. At one point he stopped breathing an pulse could not be felt, but he recovered for a time af injection of nikethamide. For a brief period he was with his head down to see whether this would dislodge obstruction; but it made no difference. The patient 15–20 minutes after the start of the attack, during oxygen had been administered continuously.

Necropsy.—A caseous mediastinal lymph-gland about 1$^{1}/$ in diameter had ulcerated through the right anterola aspect of the trachea about $^{1}/_{2}$ in. above the bifurcation. firm piece of caseous material, measuring $^{3}/_{4}$ in. in di lay across the openings of both main bronchi, compl obstructing them. The middle lobe of the right lung collapsed and showed caseous pneumonia throughout. right lower lobe showed tuberculous cuffing of the bronchi with a patch of tuberculous pneumonia at the base. The lung was distended and showed well-marked emphyse peribronchial caseation was evident near the root. Mi scopical examination confirmed that the disease was tu culous and showed emphysematous changes in the left l The right ventricle of the heart was dilated, but other o showed no abnormality.

DISCUSSION

Very few similar cases have been reported in the p twenty years.

Pichon and Cathier (1928) described acute asphyxia due intratracheal rupture of a caseous gland in a previou healthy child, aged 2$^{1}/_{2}$ years; at necropsy the trach was found to be completely obstructed by a firm case mass extruded from a tuberculous lymph-gland which h perforated the right lateral aspect of the trachea just abo the bifurcation.

Culotta (1930) reported the case of a child aged 4 yea previously healthy, who suddenly developed severe cyano with dyspnœa most marked on expiration. Necropsy revea complete tracheal obstruction by caseous material from lymph-gland which had ruptured into the anterolateral aspe of the trachea immediately above the bifurcation.

Scandroglio (1945) described the case of a boy, aged 3 yea whose symptoms included increasingly severe attacks dyspnœa and paroxysmal cough. When the tracheal ruptu took place there was a very severe asthma-like attack whic ended fatally. At necropsy, in addition to a small perforati of the bronchial wall which had occurred some time befo death, there was a wide perforation of the trachea, which w completely occluded by caseous material.

Lowys et al. (1948) reported a case of tracheal perforatio in a boy, aged 9 years, in whom the hilar glands were much enlarged. He died from asphyxia ten minutes after the onset of a sudden fit of coughing. At autopsy the lower part of the trachea and both main bronchi were filled with pus which had issued through the right anterolateral aspect of the trachea from a caseous paratracheal lymph-gland; there was also a small tracheo-œsophageal fistula.

In the case described here, the right lung was exten sively infiltrated by the tuberculous process and wa probably of little use as a respiratory organ. Apparently the onset of acute obstructive emphysema in the left lung so reduced its aerating capacity that the boy died from anoxia. With regard to the treatment of this emergency, the older reports emphasise the value of heotomy with suction, and perhaps we should have l this treatment when bronchoscopy proved difficult. e is the limiting factor. and it is unlikely that the ruction could have been removed quickly enough to the boy's life. Very vigorous percussion of the t with the child inverted might have dislodged the ruction and given more time to prepare him for ıchoscopy.

hile rupture into the trachea is rare. perforation he bronchi by caseating glands is comparatively mon.

boy, aged 22 months. was recently admitted in a state phyxia to the Alder Hey Children's Hospital, Liverpool. ıad had a cough nine months. and on admission he was osed and extremely distressed. with stridulous respira- Tracheotomy was quickly performed. but the child almost immediately afterwards. Necropsy revealed that hild had miliary tuberculosis: a caseous hilar gland had rated the right main bronchus just below the bifurcation e trachea, and a piece of caseous material lay blocking rachea a short distance above the bifurcation. Confluent rculous bronchopneumonia was present in the upper lobe e right lung.

1934 Scobie reported the case of a boy. aged 16 ths, in whom the rupture of a caseous mediastinal d through the right main bronchus near the bifur- on was successfully treated by tracheotomy and ion. Scobie found references to 94 cases of rupture aseous glands into the tracheobronchial tree. all in lren under the age of 13 years: 20 cases. including own, had recovered; of these 4 had coughed up the ous débris, while in 15 tracheotomy had been per- ed with suction or forceps to remove the obstruction 1 had been successfully treated by bronchoscopy. gényi-Göttche and Kassay (1947) found bronchial oration by caseous glands in 47·1% of necropsies on l cases of primary tuberculosis in children. Dufourt Mounier-Kuhn (1947) state that small bronchial orations in primary tuberculosis produce a typical ographic appearance—a finely nodular. partly con- t infiltration extending outwards from the hilum e lung and not quite reaching the periphery.

erforation of the trachea and main bronchi by caseous lymph-glands appears to occur predominantly on right side. The primary focus is commonest in the r lobe of the right lung. but this predominance may ue to the anatomical arrangement of the mediastinal ph-glands.

eports differ with regard to the effect of streptomycin nlarged mediastinal glands in primary tuberculosis. view of the satisfactory response of tuberculous bronchitis in adults, streptomycin may well prove ul in ulceration and perforation of the tracheo- ıchial tree in children with primary tuberculous tion.

SUMMARY

fatal case of perforation of the trachea by a caseous lymph-gland in a child is described.

racheal perforation by caseous lymph-glands is rare ng tuberculous intrathoracic infection in childhood, reas bronchial perforation is comparatively common.

anks are due to Dr. R. W. Brookfield for permission to ish this case. and for his assistance in preparing the paper: rof. Norman B. Capon for helpful criticism; to Dr. D. B. man and Dr. E. G. Hall for pathological reports; and r. Nora Walker for the radiographic reports. We also k Dr. W. E. Crosbie, medical superintendent of Alder Hospital, for permission to mention his case. and Dr. l. Todd for information.

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Reviews of Books

Operative Surgery

FREDERICK C. HILL, M.D., associate professor of surgery, Creighton University, Omaha. London: Oxford University Press. 1949. Pp. 698. 63*s*.

THIS book covers the field of the general surgeon. and Dr. Hill describes in it the operations which he has found to be most satisfactory. "Designed for the intern. resident and less experienced surgeon," it is simple and uniform in presentation, and the operations selected are on the whole good and those usually practised in this country. But seeing the objects he had in view Dr. Hill could and should have given the young surgeon more practical hints on how to overcome the many difficulties which confront him. Division of the lienorenal ligament as a first step makes removal of the spleen much easier: the prevertebral fascia must be cut through to expose the phrenic nerve lying on the scalenus anterior: the peritoneum on the under surface of the diaphragm must be divided before the œsophagus can be brought down: the best place to enter an appendix abscess is in the gutter to the lateral side of the cæcum. These are the kinds of thing which the novitiate surgeon finds so useful, and it is in these that the book is rather wanting. Moreover the uninitiated reader is likely to get his values wrong in reading it. He could never guess, from the accounts given here. how tedious is the dissection for excision of the duodenum for ulcer, or what difficulties (not even mentioned) the portal vein presents when the head of the pancreas is being excised. Modern methods of closing the bladder after prostatectomy are not described. and the instructions for removing a calculus from the lower end of the ureter are meagre in the extreme. Though there is much good in this book—and though it is beautifully produced—it does not seem to have reached its object of being a real help to the young surgeon.

Psychological Aspects of Clinical Medicine

STEPHEN BARTON HALL, M.D., D.P.M., psychiatrist, Liverpool Royal Infirmary. London: H. K. Lewis. 1949. Pp. 416. 21*s*.

Psychosomatic Medicine

The Clinical Application of Psychopathology to General Medical Problems. (2nd ed.) EDWARD WEISS, M.D., professor of clinical medicine. Temple University. Philadelphia: O. SPURGEON ENGLISH, M.D., *professor of* psychiatry in the university. Philadelphia and London: W. B. Saunders. 1949. Pp. 803. 47*s*. 6*d*.

SLOWLY and almost imperceptibly the concept of psychosomatic medicine has gained ground in this country. But, while nobody will seriously dispute Plato's dictum that "it is the greatest error of our day that physicians separate the soul from the body," opinions are still divided as to what extent and in what manner emotional factors play a relevant part in the ætiology of disease.

In Dr. Barton Hall's book, written around a series of lectures for final-year medical students and postgraduates at Liverpool University, psychological medicine is integrated with general medicine, and psychological factors. be they emotional or intellectual, are stressed in relation to structural diseases. He deals discursively with emotional and intellectual development. psychometry. and the psychoses, neuroses. and psychopathies. and then with specific psychosomatic disorders, including effort syndrome, peptic ulcer, colon neuroses, asthma. skin diseases. rheumatism. and tuberculosis. The later chapters cover personality disorders. and abnormal behaviour as a symptom of physical disease—as for example in the epilepsies. chorea, meningitis, epidemic encephalitis. head injuries. and the dementias. A comprehensive survey of modern psychiatric treatment completes a readable book in which abstruse theories and dogmas are avoided. and debatable psychosomatic problems are rightly left for future research.

The revised edition of *Psychosomatic Medicine* describes the general aspects and the special applications to general medicine and the specialties of the concept of psychosomatic disease. The chapters on personality development and psychopathology, and on psychosomatic diagnosis, are particularly instructive for the interested but uninitiated reader. It might well serve as a reference work to supplement other reading, for it is not a book to be read from cover to cover. Professor Weiss and Professor English succeed in putting across to a medical public untrained in psycho-analytical theory the important discoveries which have been made in this field by research-workers and psycho-analysts; and anybody who wants to look up any specific psychosomatic subject—be it effort syndrome, peptic ulcer, skin disorders, or the psychological aspects of dentistry—will find useful information.

Sexual Behaviour, Normal and Abnormal

Dr. Eustace Chesser. London: Medical Publications Ltd. *1949. Pp. 220. 21s.*

In books on sexual behaviour the taxonomy of Krafft-Ebing dies very hard, and the study of the classical textbooks aggravates the alarm and despondency of patients who find their impulses classified. Most atypical patterns of sexual behaviour represent an equilibrium between "basic mammalian patterns," which are physiological *and general, and various degrees of personality* disorder; and the importance of most such deviations is entirely confined to the guilt, alarm, and distaste which they produce in the patient and his circle. The main task of sexual education in dealing with deviant behaviour of all kinds is, at the moment, to deflate the emotional currency of the whole subject to a level at which intelligent discussion is possible. Dr. Chesser attempts this task with some success: he is considerably more aware of recent work on human sexual physiology and psychology than many sex educators, and though one or two of his generalisations about psychogenesis and treatment *might meet with fairly widespread dissent, especially* among strict Freudians, the readers who will profit most from the book are unlikely to challenge him. His approach to deviation, from the practitioner's point of view, is a sound one: where it is a handicap, or part of a major personality disorder, seek psychiatric advice; otherwise disregard it. Far too many people with minor deviations appear in the divorce-courts or develop neuroses, and to both these tendencies undesirably solemn or taxonomic textbooks minister. If Dr. Chesser's book, which is suitable for the social worker, the busier doctor, or the intelligent general reader, marks another step in the extension of common sense into a contentious and alarming field of psychiatry it will be most welcome.

Aviation Medicine

Its Theory and Application. Kenneth G. Bergin, M.A., M.D., A.F.AE.S., British Overseas Airways Corporation, *sometime wing-commander,* R.A.F.V.R. Bristol: John Wright & Sons. 1949. Pp. 447. 35*s.*

An up-to-date review of this subject, with an account of the work done for the Royal Air Force during the late war, has long been wanted by those interested in aviation medicine. Dr. Bergin aims, he says, at presenting to the medical profession a brief review, in readable and compact form, of the physiological, medical, psychological, and epidemiological problems associated with aviation. This calls for great discrimination, because such a review, if it is to succeed, must also be well balanced and accurate. His book fails because it is not well planned and not always accurate and carries much needless repetition. The problem of cold, for example, could have been dealt with in a single chapter; instead, the information is scattered through four widely separated chapters. A whole chapter is devoted to the effects of alcohol on man, but the fundamental work done in flight to investigate the effects of centrifugal force on pilots is dismissed in two sentences; while the physiological principles involved in the emergency ejection of a pilot from his aircraft by the use of an explosive charge are not discussed at all. The writer of a textbook must discriminate between the relative values of available information. Dr. Bergin does not mention death due to anoxia, or the fatalities caused by decompression sickness and their significance—though he finds space to note that "the nicotine content of tobacco varies with the seed, soil, fertilizer and methods of harvesting curing," and that "pregnancy is not an illness but physiological state." This disappointing book is fusely illustrated, but some of the photographs misleading and many of the diagrams require explanation.

El diagnostico del embarazo con batracios machos

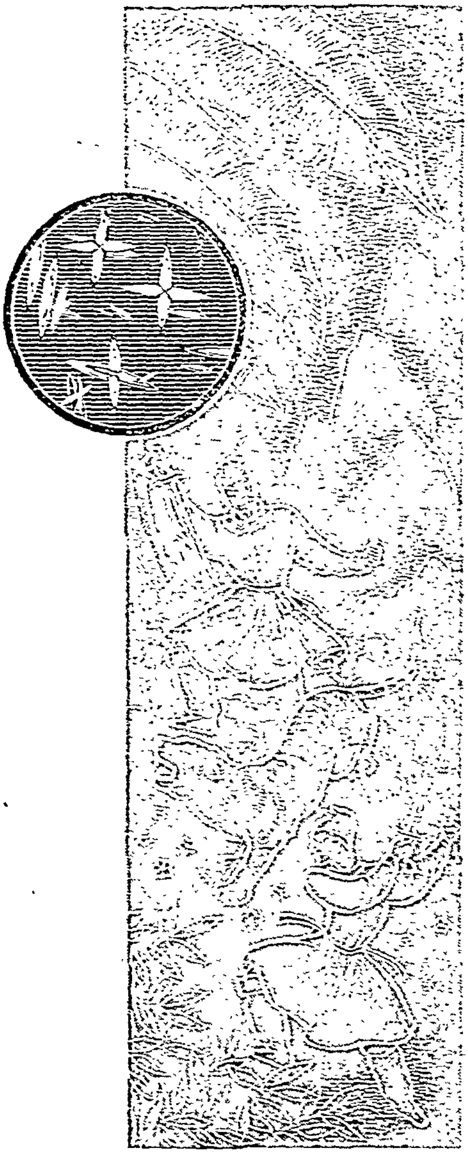
Carlos Galli Mainini, physician to the end diseases service, Rivadavia Hospital, Buenos
Buenos Aires: Artecnica Impaglione. 1948. Pp. l
m. $ n. 35.

This is a simple and practical monograph on the biological test for pregnancy using male batrac (toads and frogs) which the author introduced two years ago. Much of the subject matter has a been published—almost all of it in Portuguese or Spa He now presents this in a compact form with full description of his own methods and results. experimental and diagnostic data are given. It is for European readers to remember that Galli Main work has been on South American toads. Should t carry out similar work on European frogs and toa *and equally useful results are to be expected*—they m make corrections for dosage to allow for the size of the European anura. Besides 11 tables th are 22 illustrations, photographs, and drawings. photomicrographs are not well reproduced.

Human Helminthology (3rd ed. London: He Kimpton. 1949. Pp. 744. £2 10*s.*).—In Prof. Ernest Car Faust's informative textbook, the worms return with a we of new detail, collected for the most part during the war doctors who had the care of troops in tropical countries. T text has been revised completely, and is well illustrated wi photographs, photomicrographs, and diagrams. Empha falls more strongly perhaps on the zoological than on th clinical aspect of the subject, but both are covered. In a case those who essay to destroy these parasites must be by becoming familiar with their home life.

Hale-White's Materia Medica (28th ed. Londo J. & A. Churchill. 1949. Pp. 532. 16*s.*).—*Dr. A.* Douthwaite and the publishers have done well to rev *"Halo-White" so thoroughly,* in view of the many chan necessitated by the appearance of the *British Pharmacop 1948.* There will certainly be a large demand for this famil work. The contents might well be rearranged so as to gro the drugs affecting the autonomic nervous system together a measure which medical students striving to unders their pharmacology would appreciate. The analeptics, to might be assembled in one place, nikethamide and lep being removed from their isolation between camphor menthol. But the needs of the ordinary medical reader for textbook embodying recent *changes and* recent advances brief have been well met, and as usual the standard production is high.

Britannica Book of the Year, 1949 (London: Encyclo pædia Britannica Ltd. 1949. Pp. 712. £2 10*s.*).—In th course of ten years' hibernation this monster has becom almost fabulous; but here it is again as fine as ever. Th purpose of these yearbooks is to give a summary of wor events of the preceding year; and in this volume Walte Yust—with the able assistance of William Clark and a tea of distinguished contributors whose names in small type fi nine quarto pages—spreads the panorama before us. Many articles deal with medicine, ranging from such recent aspects as the start of the health service, psychosomatic disorders and the discovery of new drugs and remedies, to such hardy stand-bys as the drug traffic, accidents, and the common cold Individual diseases and disabilities which have a general or social interest also have been given a place, including tuberc losis, diabetes, arthritis, poliomyelitis, and deafness. But in *1948 there were plenty of events* besides those of medical interest, and the book has plenty to say about them, beginning with the coronation of Abdullah-Ibn-Hussein as King of Transjordan, and ending with the appointment of Gideon Brand van Zyl to the governor-generalship of the Union of South Africa. Good photographs illustrate many of the articles. Altogether this is just the Christmas pre-ent for those who find solace in current—or near-current—affairs



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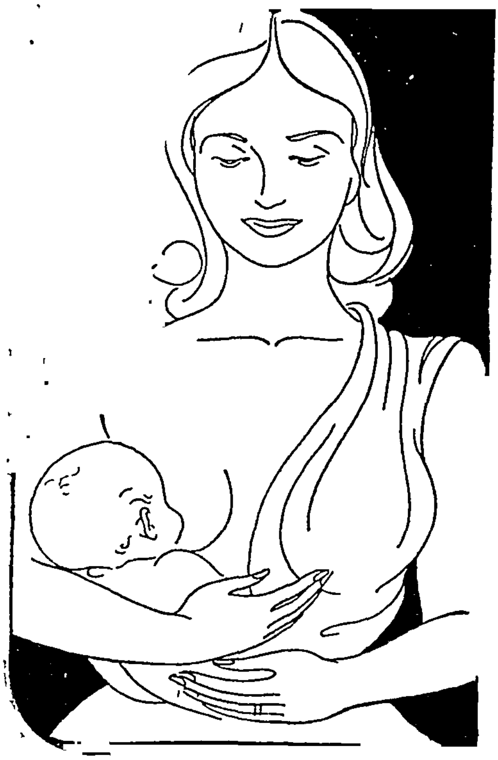

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THE LANCET

LONDON: SATURDAY, NOV. 5, 1949

Hospital Costs

the last decade the cost of maintaining a patient ɔspital has increased alarmingly. The records ing Edward's Hospital Fund for London show among 159 voluntary hospitals the average ly cost for an occupied bed rose from £3 19*s.* 7*d.* '38 to £8 12*s.* 8*d.* in 1946 and £11 4*s.* in 1947; :he rise continues. In other lands it is equalled possibly surpassed. In Sweden, for example, tal costs in 1948 were about three times those in : and the weekly cost of maintenance in the ge general hospital, before devaluation, was t £12.[1] In the U.S.A. the national average cost lay of short-stay patients went from $8·60 in to $13·09 in 1948; and in *one* State the average per day in 1948 was almost double what it was 45.[2] The rise may, of course, be explained in us ways; but, discounting the change in the of money, the principal factors are probably delayed adjustment of the hospital to its environand (2) an intensification of internal pressure from ospital, reflecting the advance of medicine.

adjustment to changing social circumstances ıeant an overhaul of remuneration and hours of of all grades of hospital staff, and has at the same required the hospitals to alter their simpler century methods of handling patients. Thus verhaul of hospital catering and the introduction ɔpointments for outpatients lead to increased ıditure. The demand for such an adjustment n important, though largely unconscious, element pressure for a National Health Service, and it l be unfortunate if "economies" were now to be which curtailed this desirable process. A prere halt would certainly bring a host of troubles train; one would have to expect persistent ılty in the recruitment of staff of the right 'e, and constantly bad relations between the tal services and a public impatient of obsolete ptions of comfort and convenience. This adjusthas in these post-war years made a good ning; but it is only a beginning, and a perceptible er increase in expenditure will be needed before ı be said to be complete.

e intensification of the internal pressure reflecting lvance of medicine may yet cause an even greater ıse in the cost. For a long time now, and more ially since the great forward movement of cine began in the '80s and '90s of last century, nedical staff of almost every hospital has been ing for more." It is of the very essence of a good tal administration to find a means of handling pressure without blunting its edge. With limited rces the financial side cannot always say "yes" ery demand for additional facilities, and there o be some means of determining priorities and sing the strength of the relative claims. So as the hospital was the unit, as in the voluntary m of Great Britain and America, the mechanism h provided for discussion of priorities in the medical staff committee sufficed pretty well to sift the grain from the chaff and to allow of a controlled expansion. But several things have happened in recent years to make the problem more difficult and more complex; and part at least of the upward surge of expenditure now going on may be attributed to the weakening of this old machinery. The development of specialties has made it harder and harder for the medical men as a group to answer for the necessity of this or that; and now the change in the method of financing the hospital services has obscured the fundamental need to provide this cross-check of medical opinions against each other.

This is one of the strongest reasons not only for a strengthening, and a better understanding of the functions, of the medical staff committees in the hospitals, but also for a change-over to a system of round-sum allocations to each regional board and thence to each hospital management committee. Only so can we institute a system whereby at each important stage projects for increased expenditure have to run the gauntlet of medical criticism, and of competition with other more or less comparable medical needs, before ever they come before the lay committee. Matters must be so arranged—as they were in the old voluntary hospitals—that the doctors themselves prune the vigorous growth of the many-branching tree of the hospital service; for, if they do not do the pruning, some clumsy piece of political or administrative machinery must be invoked, which is as likely as not to cut away the fruit buds with the useless wood. Today the arrangements are weak at all three levels. In the hospital management committees the medical staff committees tend to be sidetracked when proposals for expenditure are under consideration, and their former status has actually been impaired by the appointment of medical men to the hospital management committees themselves. At the regional level the medical advisory committees seem to be preoccupied with medical staffing throughout the region, and have enjoyed something of a free hand in spending public money on appointments without having to weigh up this expenditure against other medically urgent needs. At the centre the Central Health Services Council has not, so far as we are aware, been afforded any data to enable it to form comparisons of this kind; and in any case it is probably not constituted in a way to permit it to perform such a function.

Nobody would suggest that the necessary modification of method will be easy; but unless a way can be found it will not be surprising if the internal pressure exerted, with the best of intentions, from the medical side gets more and more out of hand.

Amputations

THE ill wind of war at least blows good to the amputee by stimulating interest in the technique of amputation and in the making and fitting of artificial limbs. Since the first world war these last two tasks have largely been in the hands of the Limb-Fitting Service of the Ministry of Pensions, and under the N.H.S. this service has been extended to every amputee in the country. The advantages of such centralisation are obvious, and some of its results have lately been described by Dr. A. W. J. CRAFT.[1]

ırles, J. A. *Lancet*, Sept. 24, p. 571.
Amer. med. Ass. Sept. 10, p. 136; see *Lancet*, Oct. 8, p. 639.

[1] *Ann. roy. Coll. Surg. Engl.* 1949, 5, 190.

Each war produces a generation of surgeons who become only too familiar with amputation and soon learn what are the desiderata of a good stump according to the views of the time. But no surgeon does many amputations in peacetime, and Dr. CRAFT's plea that they should be the province of the orthopædic surgeon is probably sound. However, any surgeon may be called on to do an emergency amputation after injury; so all should know the requirements of the limb-fitter well enough not to leave him an entirely unsuitable stump to fit.

With antibiotics and the modern treatment of shock it is seldom that a definitive operation cannot be done at once, particularly if the technique of delayed primary suture be followed. The steadily mounting experience of the limb-fitters has shown that there are ideal levels which ensure the best control of the prosthesis with the least danger of later circulatory troubles in the stump: these are 10–12 inches of femur from the great trochanter, $4^1/_2$–5 inches of tibia, 8–9 inches of humerus, and 6–7 inches of radius and ulna. Disarticulations are usually bad—there is no room for the joint in the prosthesis—and in both hip and shoulder the preservation of a short stump of bone is helpful because it enables the patient to wear a tilting-table limb in the former and a more comfortable prosthesis in the latter. If one cannot preserve more than 5 inches of femur the patient is better off with a tilting-table limb, and the femur should be shortened to 2 inches below the great trochanter. Below the knee it *is* possible to fit a satisfactory limb with as little as $1^1/_2$ inches of tibia, but the longer the better up to 5 inches. (Stumps longer than this are liable to suffer from malnutrition of the soft parts.) Opinion with regard to Syme's amputation, adverse at the beginning of the late war, seems to be swinging back again; it is a popular operation across the Atlantic, where many examples can be seen giving no trouble after twenty years and more. There is no doubt that poor technique accounts for many of the cases requiring later amputation at a higher level.

To do an amputation well requires experience and judgment—it is not an operation to leave to the junior registrar without supervision. At all sites except the hip, shoulder, and ankle the scar should be transverse and lie posteriorly on the end of the stump, to avoid pressure against the socket. Above all it must be mobile, and this, as Prof. G. PERKINS has stressed, can best be ensured by careful suturing of the deep fascia across the bone end, the skin then remaining mobile on the fascia. In all types of artificial limb some "piston action" takes place between stump and socket, and it is the resultant drag on a scar adherent to bone that may lead to pain and breaking down of the wound. Bulky muscles should be trimmed back; nerves should be divided cleanly and otherwise left strictly alone—a neuroma will form whatever the surgeon does. No object is served by suturing the muscles across the bone end. By careful trimming of the flaps and accurate suturing a linear scar can and should be produced, and, as Dr. CRAFT points out, this is the time to do it. The necessity for a later soft-parts operation to cure the intertrigo of a puckered scar would not then arise so often. The preparation of the stump for the prosthesis must start as soon as the acute postopera pain is over; full mobility of the joint above sh be regained by the time the stitches are remo and correct bandaging and exercises start forth These simple points have all been stressed before, Dr. CRAFT tells us that they are not always atte to. In the patient's interests it behoves us not make the limb-fitting surgeon's task more diffic and this is particularly so in the case of chil where the careful follow-up at Roehampton exposed *many of the traps into which* we may Bones in children's stumps do not grow exactly we might expect from our knowledge of anato and physiology.

Malignancy: a Hypothesis

IF the ovaries of mice are removed at pube structural and functional differentiation of the bre does not take place. But if an œstrogen is appl to such mice the cells of the rudimentary bre undergo vigorous multiplication; the milk-du enlarge and grow into the stroma, glandular ac sprout from their blind ends, and secretion appe in their lumina. Stock mice vary widely in th response, but experimentalists *have found that* uniform maximum degree of cell multiplication be obtained by inbreeding œstrogen-sensitive strains. Using such a strain Dr. B. D. PULLINGER, of t Imperial Cancer Research Fund Laboratories, h shown that there is a true quantitative relation betwee the weight of œstrogen administered and the glandula differentiation and secretion produced. It is clearly permissible to regard œstrogen as a histospecific hormone, and it is impossible to escape the conclusion that this hormone, and the œstrogen-*like* steroids which produce an identical pharmacological respons have a powerful and specific effect on the gland cel of the breast, impelling their nuclei to mitosis an governing their functional differentiation.

In her Kettle lecture which we publish this wee Dr. PULLINGER describes the characters of the trans-plantable, naturally occurring, mammary adeno-carcinoma of mice. Careful examination by Profess PASSEY's team in Leeds has shown that the cells of some of these tumours do not contain the virus-lik milk-factor of Bittner; and it has also been demon-strated that such tumours *grafted into* spaye females, and even into males, will grow just as we in this œstrogen-free environment as in the intac female. The capacity of these virus-free tumours to grow in the absence of ovarian hormone is an arresting feature, and Dr. PULLINGER *devoted* much of he lecture to a closely reasoned discussion of its signifi-cance. The steps in her argument *may* be summarised as follows:

1. Biological evidence suggests that cell division i *more likely to be due to a positive* stimulus than to the absence or removal of *a* restraining influence.

2. In the breast at puberty, and during the non-*malignant phase which precedes the* development of mammary adenocarcinoma in mice, the stimulus to cell division is an ovarian hormone.

3. There is a close enough resemblance between th breast at puberty reacting to œstrogen and the func-tionally differentiated adenocarcinoma of mice to suggest *that in both of them growth and* differentiation are du to the same positive stimulus—i.e., an œstrogen.

If this is conceded, it is not improbable that the ; of the adenocarcinoma acquire the property of orating an œstrogen within their own substance. ; would explain not only the increased rate of cellular iferation of the tumour cells but also the functional entiation of the growth itself. Such differentiation er physiological conditions can only be produced by histospecific hormone of the ovary.

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Folic Acid and its Antagonists

HE idea that folic acid was the actual antinicious-anæmia liver factor had to be given up as n as it became clear that highly active purified liver racts contained no detectable folic acid. But the leniable fact remained that folic acid did transform characteristic megaloblastic hyperplasia to normostic, and, so far as could be seen, did it very comtely. **Bethell** and others [1] in America suggested t liver extracts acted by liberating free folic acid n the conjugated forms in which it exists in ural foodstuffs. Experiments and trials designed test this hypothesis have produced conflicting ılts ; the available evidence was lately summarised **Wilkinson** and **Israëls**,[2] who concluded that the othesis could no longer be sustained ; **Davidson**,[3] ever, takes the contrary view. Meanwhile, erican workers who are trying to find the link ween liver factor and folic acid have turned their ention to a different approach—by studying the ects of folic-acid antagonists.

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Each war produces a generation of surgeons who become only too familiar with amputation and soon learn what are the desiderata of a good stump according to the views of the time. But no surgeon does many amputations in peacetime, and Dr. CRAFT's plea that they should be the province of the orthopædic surgeon is probably sound. However, any surgeon may be called on to do an emergency amputation after injury; so all should know the requirements of the limb-fitter well enough not to leave him an entirely unsuitable stump to fit.

With antibiotics and the modern treatment of shock it is seldom that a definitive operation cannot be done at once, particularly if the technique of delayed primary suture be followed. The steadily mounting experience of the limb-fitters has shown that there are ideal levels which ensure the best control of the prosthesis with the least danger of later circulatory troubles in the stump: these are 10–12 inches of femur from the great trochanter, $4^1/_2$–5 inches of tibia, 8–9 inches of humerus, and 6–7 inches of radius and ulna. Disarticulations are usually bad—there is no room for the joint in the prosthesis—and in both hip and shoulder the preservation of a short stump of bone is helpful because it enables the patient to wear a tilting-table limb in the former and a more comfortable prosthesis in the latter. If one cannot preserve more than 5 inches of femur the patient is better off with a tilting-table limb, and the femur should be shortened to 2 inches below the great trochanter. Below the knee it *is* possible to fit a satisfactory limb with as little as $1^1/_2$ inches of tibia, but the longer the better up to 5 inches. (Stumps longer than this are liable to suffer from malnutrition of the soft parts.) Opinion with regard to Syme's amputation, adverse at the beginning of the late war, seems to be swinging back again; it is a popular operation across the Atlantic, where many examples can be seen giving no trouble after twenty years and more. There is no doubt that poor technique accounts for many of the cases requiring later amputation at a higher level.

To do an amputation well requires experience and judgment—it is not an operation to leave to the junior registrar without supervision. At all sites except the hip, shoulder, and ankle the scar should be transverse and lie posteriorly on the end of the stump, to avoid pressure against the socket. Above all it must be mobile, and this, as Prof. G. PERKINS has stressed, can best be ensured by careful suturing of the deep fascia across the bone end, the skin then remaining mobile on the fascia. In all types of artificial limb some "piston action" takes place between stump and socket, and it is the resultant drag on a scar adherent to bone that may lead to pain and breaking down of the wound. Bulky muscles should be trimmed back; nerves should be divided cleanly and otherwise left strictly alone—a neuroma will form whatever the surgeon does. No object is served by suturing the muscles across the bone end. By careful trimming of the flaps and accurate suturing a linear scar can and should be produced, and, as Dr. CRAFT points out, this is the time to do it. The necessity for a later soft-parts operation to cure the intertrigo of a puckered scar would not then arise so often. The preparation of the stump for the prosthesis must start as soon as the acute postopera pain is over; full mobility of the joint above sh be regained by the time the stitches are remo and correct bandaging and exercises start forthwi These simple points have all been stressed before, Dr. CRAFT tells us that they are not always atte to. In the patient's interests it behoves us not make the limb-fitting surgeon's task more diffic and this is particularly so in the case of chil where the careful follow-up at Roehampton exposed many of the traps into which we may f Bones in children's stumps do not grow exactly we might expect from our knowledge of anato and physiology.

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after the last dose. Meyer et al. also reported results with one patient who was given vitamin B_{12} together with the folic-acid antagonist amethopterin; the results were similar—there was no remission, no reticulocyte response, and megaloblasts persisted in the marrow.

It is clear then, that folic-acid antagonists are, as a rule, very toxic substances, which, when given to animals, can depress or disturb the formation of all the blood-cells, and in human pernicious anæmia will cause the megaloblastosis to persist in spite of liver treatment that should reverse it. The toxicity of the drugs, however, makes it difficult to assess how far the changes induced are due to a non-specific depression of erythropoiesis and the formation of other blood-cells, and how far they are similar to human deficiency diseases. Meyer et al. interpret their results as showing that pteroylglutamic acid is necessary for the normal production of red blood-cells, and is presumably the real operative agent that transforms the pathological megaloblastic marrow the physiological normoblastic state. They apparently given up the conjugate-liberation hy thesis and quote with approval Jacobson's suggest that liver factor, and vitamin B_{12}, act by convert "free" folic acid to a "reduced" form. If this so, surely the next step is to prepare this "reduced folic acid and test it in patients with pernici anæmia in relapse. The results of this experiment a less dangerous one, we hope, than that with folic-a antagonists—should be instructive. For, if folic is of primary importance compared with liver fac and vitamin B_{12}, it has to be explained why so patients with pernicious anæmia relapse on treatment and why neurological relapses occur. There evidently some connexion between liver fact vitamin B_{12}, and folic acid, but more facts are clea needed before any acceptable hypothesis can worked out.

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7. Leading article, *Lancet*, 1947, i, 795.

Annotations

WORLD TEMPERATURE AND THE FATE OF NATIONS

For many years now Dr. Clarence Mills, of the University of Cincinnati, has argued that human life and the fortunes of nations depend on the temperature of the portion of the earth they inhabit. As the hive is heated, so the creatures move; but with the difference that it is cold that moves them to activity and heat that stifles and chokes their ambitions and abilities. According to Mills,[1] after several weeks in a hot humid environment physical and mental activity decline, the secretions of thyroid, suprarenals, and gonads diminish, and initiative gives way to a desire for ease and security. The growth of children, he believes, is slowed, the onset of puberty is delayed, fertility is reduced, and resistance to infection is lessened. He attributes these effects to the difficulty of heat-loss in such an environment, *claiming that if the body cannot dissipate its waste heat,* the total combustion must be reduced accordingly.

There is evidence in favour of at least his main contentions. Some of it—perhaps the more convincing part—comes from the laboratory. The ability of rats to solve maze-tests is sharply reduced by keeping them in a hot moist climate, and their memory (i.e., power of retention of the solutions) is likewise depressed. Then fertility declines despite increased matings and the growth-rates are decreased. Evidence for the human is necessarily statistical, but Mills says that it supports his thesis. Conception-rates in the hot climate of Florida decline by 30% during the long summer heat, while in Maine, with temperatures like those of an English June, conceptions rise to their highest for the year. The results of conception are likewise influenced by the conditions under which it takes place. In the latitude of Cincinnati the children conceived during July and August have only half the chance of entering the university of those conceived in winter. They have less chance of appearing in *Who's Who.* As for Presidents of the United States, the present incumbent is the only August conception ever to have reached that office!

Mills goes further than this, and seeks to explain the history of peoples by the alleged changes in world temperature since the Ice Age. The days of Greece and Rome were in what he calls a cold millenium, the Dark Ages in a succeeding hot one. Today temperatures are moving irregularly upwards; the nations of t north will become the receivers of optimal temperat conditions. Coincidently the semitropical letha which (Mills believes) engulfed Greece and Rome, i creeping northwards over the United States and Centra Europe. Perhaps this part of the hypothesis is the most open to criticism—though also the most interestin He talks all too glibly of cycles, when the statistici knows that to establish the existence of a true cycle that is, a cycle that cannot be reasonably attribut to chance variations—is extraordinarily difficult. Mo of the so-called business cycles have little attraction wh viewed with the eye of probability theory, and Mills 2000-year cycles are frankly unsubstantiable by a known technique.

Here is one fascinating task for geographers a mathematicians. And on the other side, physiologi need to know far more of the effects of heat on the bod Intensive study developed during the late war, a continues to some extent, for practical reasons. B its theoretical importance may prove more than it initiators anticipated, if Mills is even partly right his opinions.

THE NOBEL PRIZEMEN

The Nobel prize for physiology and medicine has bee awarded jointly to Prof. Walter Rudolf Hess, of Zurich and Prof. Antonio Egas Moniz, of Lisbon.

Professor Hess has won fame by his experimenta physiological investigations of the diencephalon, employ-ing permanently inserted electrodes which allowed hi to observe the animals in conditions as natural possible. The results of his and his collaborators' work which has been going on for about three decades, hav been incorporated in a recent monograph on Da *Zwischenhirn.*[1] What must strike the reader of thi book, as well as of his numerous earlier publications are the high qualities of sustained purpose and of scientific accuracy with which he proceeded step by step to unravel the complexities of this brain centre. His main interest was in the localisation of autonomic function, but he also investigated the rôle of the diencephalon in the control of sleep, instincts, and emotion.

While Hess's studies have been made in the remote atmosphere of the laboratory, Moniz's work has been practical. Though his two contributions to medicine ar unconnected with each other—the one aiming at diag-nosis, the other at therapy—they have in common bol imagination. In 1927 Moniz (with Almeida Lima) intro-

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[1] *Science*, 1949, 110, 267.

[1] Hess, W. R. Das Zwischenhirn. Basle: Schwabe. 1949

·d cerebral angiography, which now holds, all over world, an important and undisputed place in the nosis of intracranial disease. His other contribution prefrontal leucotomy, which was first performed on uggestion by Lima in 1935, after he had attended econd International Neurological Congress in London listened to Fulton and Jacobsen's report on the t of frontal lobectomy upon the behaviour of npanzees.

iere is an extra significance (probably not unintended) is partnership. The frontal lobe and the diencephalon closely linked and are widely regarded as the pivot system of centres whose function may be the central lation of emotion, emotional expression, and per- lity make-up. That the work of the two men should been connected by the joint award might be rpreted as a recognition of the present tremendous ch. in psychiatry and neurophysiology, for a physical s of mental function and dysfunction.

THE EVOLUTION OF APES AND MEN

the fifth William Smith lecture, delivered before Geological Society of London on Oct. 19, Prof. E. Le Gros Clark, F.R.S., reviewed the contribution e by recent fossil discoveries to the problem of the ution of the Hominoidea—that is, the group of nates which includes Man and the anthropoid apes.

is now known, largely as the result of the energetic orations of L. S. B. Leakey, that in East Africa ng early Miocene times (probably 25–30 million s ago) primitive types of anthropoid apes flourished reat variety. Some of the smaller species, Limno- ecus, were evidently related (and may have been stral) to the modern gibbons. In their dentition showed marked similarities with other extinct on-like forms such as Propliopithecus and Pliopi- us. The latter have been known for some time from and teeth, but no remains of their limb skeleton e ever been found. Quite recently, Leakey made important discovery of some limb bones of the East can representatives of this group. These unique imens are now being carefully studied, and it is ady clear that, while they show certain hylobatine ures in their structural details, in the general limb portions, they had not yet developed the characteristic ialisations of the modern gibbons. The larger cene apes which were contemporaneous with Limno- ecus are now represented by very numerous remains aws and teeth, and also by a few limb bones. The er demonstrate that these types had also not yet eloped the brachiating specialisations which are mon to all the modern large apes. The skull of one he fossil large apes, *Proconsul africanus*, is of the test interest, for it is the only skull of a Miocene so far discovered. It shows a number of primi- features in which these early apes had hardly anced beyond the cercopithecoid level of evolutionary elopment.

eferring to the fossil "man-apes" (Australopithecinæ) n South Africa, the lecturer emphasised the great ntity of new material which has been discovered in last two years, consisting of many specimens far e complete than those previously known. In par- lar, the almost complete and undistorted adult skull overed by R. Broom at Sterkfontein in 1947 now mits more accurate comparative studies. An examina- n of some 400 adult ape skulls has shown that in a nber of characters the Australopithecine skull roaches Man much more closely than do any of the dern apes. This is made particularly clear by the parison of indices expressing the upward extension the nuchal area on the back of the skull, the total ght of the skull above the level of the orbits, and forward position of the occipital condyles. The fundamentally hominid characters of the Australopithecine dentition similarly find no parallel in the anthropoid apes. A survey of more than 150 immature skulls of modern apes, for example, makes it clear that in the latter the strikingly human characters of the milk dentition of the Australopithecinæ are in no case even closely approached. Indeed, it may now be stated that, while there are many basic features in which the dentition of the fossil "ape-men" depart widely from that of the anthropoid apes, there seem to be no really fundamental characters whereby it can be certainly distinguished from primitive hominids of the Pithecanthropus group (not even in the absolute size of the molar-premolar series). The hominid characters of the skull and dentition of the Australopithecinæ are matched by those of the pelvis discovered at Sterkfontein in close association with skulls and other parts of the skeleton of these extinct creatures. The pelvis is quite unlike that of the anthropoid apes and is fundamentally human in its general form. At the same time it shows certain peculiar features which distinguish it from modern types of Man.

Another Australopithecine pelvis discovered at Makapansgat (some 200 miles north of Sterkfontein) is also fundamentally human and reproduces the same unusual features which are distinctive of the Sterkfontein specimen. These new discoveries, taken in conjunction with the evidence of the skull and of other portions of the limb skeleton, appear firmly to establish the earlier inferences that the Australopithecinæ were capable of standing and walking in approximately human fashion.

All these comparative observations go far to substantiate the conclusions of Dart and Broom that the South African fossils represent a group of primitive hominoids which were at least closely allied to the precursors of Homo. In other words, it is hardly possible any longer to evade the conclusion that, in spite of the fact that they possessed a brain not much larger than that of a gorilla, they are to be classed as representatives of the hominid, rather than the anthropoid-ape, sequence of evolution.

A MOROSE MEETING

AT the annual conference of Representatives of Local Medical Committees on Oct. 27, the mood was anxious and subdued. The keynote speech came from Dr. S. Wand, chairman of the General Medical Services Committee, who declared: "We are fighting for more than money—we are fighting for status." It was with money and status that the meeting was mainly concerned. As to status, representatives were able to take some comfort from the Ministry of Health's recent circular[1] recommending that general practitioners should continue to have hospital beds at their disposal. But if the Ministry understands the importance of the general practitioner—and this circular is almost the first hint in eighteen months or more that it does—the public, it seems, do not; and their growing importunities led representatives to call for machinery to deal with complaints against patients, who, it was suggested, should be guided by a code of rules printed on their medical card.

The discussion on remuneration was inevitably overclouded by the economic situation. Indeed, one speaker proposed that the practitioner's claims should be fully met only "when the financial state of the country permits." "Who are we," he asked, "to place our services above those of all other sections of the community?" To which Dr. J. A. Ireland replied that this assumed a position that did not exist; for doctors differed from other workers in that no agreed rate had ever operated between them and the Ministry of Health. At what level the rate will—if ever—be agreed may depend partly on the results of the Ministry's investigation of present earnings, which the Minister himself said

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1. See *Lancet*, Oct. 15, p. 703.

must be completed before any action was taken. Dr. Wand told the meeting that the contents of the report became known to the General Medical Services Committee last August: but the report's value had been disputed on the score that it disregarded recent compulsory reduction in lists of over 4000 and the position in partnerships where money paid to one partner was out of proportion to his share of the practice. The report was in fact "misleading and unreliable," and the Ministry was now redrafting the tables in it. The delay, which had now lasted many months, might almost be described as a Government weapon. "I for one," said Dr. Wand, "see no reason at all why we should not determine from July 5 what is the proper amount of money in the pool in the light of the Spens report." Later in the meeting Dr. Wand's unwontedly brusque reaction to claims made on behalf of rural practitioners suggested that the report at least makes clear that this group is faring better than was once believed. But the difficulties of the suburban and of some urban practitioners was disputed by none. Testimony was not lacking. For instance, Dr. P. Y. Lyle, of Southport, declared: "Ours is an over-doctored area, and 93% of the population is on the executive council's list. If we cannot secure retrospective improvement in remuneration, the position will be extraordinarily serious." Dr. W. D. Anderson spoke of smouldering resentment in Glasgow, where private practice was now almost non-existent: and Dr. H. B. Woodhouse, who seemed to favour withdrawal from the service if the practitioners' claim were not soon met, argued that doctors in industrial areas would be readier to support this action if only they realised that, were the claim denied, other doctors would flock into these industrial regions. In any event was it right—as figures had shown in respect of Glasgow and Manchester—that dentists and opticians should earn net incomes in excess of those earned by medical practitioners? The gloom was slightly lightened by Dr. Wand's announcement that the balance of the Special Inducement Fund, amounting to about £95,000, could now be used to help doctors who were in difficulty even if they did not work in an inducement area. It is proposed that grants shall be made on a limited and descending scale over a period of perhaps three years, to tide practitioners over transitional difficulties.

Turning to the matter of practice vacancies, representatives agreed that the delay in filling these is in the neighbourhood of three months, and several expressed disgust that local decisions had been overruled by the Medical Practices Committee. To this it was retorted that local executive councils had not always carried out their task of selection either thoroughly or objectively. Both sides were satisfied with a compromise motion proposing that when making an appointment the Medical Practices Committee should invite a representative of the local medical committee to attend for consultation. Among the further topics on which the representatives touched was the collection of the new Government charge on prescriptions. Dr. J. A. Pridham argued that, whoever collected the money, it should not be the doctor; and on behalf of rural practitioners who do their own dispensing Dr. J. C. Pearce roundly declared the scheme to be impracticable. Dr. A. Talbot Rogers felt that not only old-age pensioners but also people ill for more than a month should be exempted from the charge.

An Eastbourne motion calling for payment of a fee of not less than one guinea for the performance of circumcision drew from another representative the sardonic comment that if this were granted there would not be a foreskin left in the country. Representatives found it difficult to decide whether to meet next in June, when tired and bellicose, or in October, when fresh and resourceful. Finally they opted for October. Perhaps by this time next year [illegible]ore news for the conference: but, judging by the tone at this gathering, few dare hope that all the news will good.

MORPHINE IN FIRST-AID

"Among the remedies which it has pleased Almig God to give to man to relieve his sufferings none is universal and so efficacious as opium." Thus wr Sydenham in 1680, and his words are still true. It particularly in emergencies that its easy administra and relative safety make morphine invaluable; to injured man it not only brings relief from pain, and fatigue but may also be life-saving. It is th the main weapon in first-aid, whether this is give a doctor or by a regimental stretcher-bearer or na orderly in wartime. In peacetime only qualified do dentists, midwives, and the captains of ships are all to keep morphine for use in emergencies. How should this privilege be extended? This questio raised last week in a Manchester magistrate's c when Mr. Wilson Hey was prosecuted, at his own req in connexion with the supply of morphine to mou rescue parties and depots. For many years it been the policy of the Mountain Rescue Committe equip trained rescue parties with two rucksacks, containing first-aid necessaries, including two amp of gr. 1/3 of papaveretum, and the second "me comforts."[1] The rescue parties are fully instructed the use of these things and have attained a high stan of efficiency. The supply and replacement of their are centrally controlled, and Mr. Hey has hith personally supplied the morphine because the Ho Office would not sanction a direct supply, though applied for such sanction in 1934 and again rece To draw public attention to what he considered injustice Mr. Hey invited prosecution under the Dan ous Drugs Acts and was duly fined £10 and 10 gui costs. He pointed out that mine rescue parties, wh case seems closely analogous with the mountain are officially allowed to carry morphine. A still stro argument was that in the fifteen years during which has supplied the morphine, and has kept his committee record of all injections given, there have been no mish due to wrongful administration, and less than gr. 1⅓ unaccounted for. Nevertheless, as the law stands mountain rescue party can only carry and use morph on the rare occasions when it is accompanied by a doctor.

The aim of the dangerous drugs regulations is pres ably to prevent morphine falling into the hands of add and to prevent its being wrongly given to a casualty To an addict, gr. 1/3 of papaveretum will appeal more than a glass of mild ale to an alcoholic; and the careful records kept by Mr. Hey's committee seem to be a complete protection against misappropriation. The danger of the morphine being given without due ca must be small. In the war the crews of tanks and aircraft were equipped with syringe-ampoules which still further simplified administration, and the ma hundreds of injections that they gave to their inju comrades did much good and very little harm. The Mountain Rescue Committee has already been offici recognised by the Ministry of Fuel, who grant them petrol coupons, by the Ministry of Health, who gran them ambulance facilities and share in their work of maintaining rescue posts, and by the Ordnance Survey. Now that Mr. Hey has so bravely brought the subject to their notice, the Home Office might surely trust them with morphine.

Dr. DONALD HUNTER will deliver the Ernestine Henry lecture on Tuesday, Nov. 15, at 5 P.M., at the Royal College of Physicians of London. He is to speak on Devices for the Protection of the Worker Against Injury and Disease.

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[1] Barford, J. E. Q. Climbing in Britain. London, 1947; p. 137.

Special Articles

INTERNATIONAL TENSIONS
CHALLENGE TO THE SCIENCES OF MAN[*]

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HERE is no need to repeat what has been said so often in so many different ways—that this is a critical od in our history. In previous generations there have . men who had reason to cry " These are the times try men's souls " ; but that brings us little comfort y. The combination of atom bombs, " iron curtains," nsive alliances, chauvinism, racialism, charges and nter-charges in the Cold War—all of this brings home s the reality of the danger. Everywhere in the world meets people who. because they feel helpless, are hopeless, and find a kind of escape in an apathetic gnation, doing nothing, just waiting for what may e.

his feeling of helplessness is perhaps the greatest ger of all. It paralyses action, even among those se action might count for something. It affects men gh places and in low. People everywhere are asking : hen will war come ? " ; not " Can we do anything to it from coming ? "

here are some important exceptions ; there are viduals and organisations that are doing what they Unesco is one such organisation. In the fields of ation, science, and culture, it is trying to cut across onal barriers and bring men closer together ; and of its important activities is its project on " tensions cting international understanding." This was coned by the general conference of Unesco at Mexico in 1947, and reaffirmed at Beirut in 1948, when the ctor-General was instructed to promote inquiries :

> The distinctive character of the various national cultures, ideals, and legal systems.
>
> The ideas which the people of one nation hold concerning their own and other nations.
>
> Modern methods developed in education, political science, philosophy, and psychology for changing mental attitudes, and the social and political circumstances that favour the employment of particular techniques.
>
> The influences which make for international understanding or for aggressive nationalism.
>
> Population problems affecting international understanding, including the cultural assimilation of immigrants.
>
> The influence of modern technology upon the attitudes and mutual relationships of peoples.

SOME QUESTIONS ANSWERED

et me begin by commenting briefly on some of the stions which we have been asked most frequently those who hear about the Tensions Project.

irst, what do we mean by " understanding " ? arly we do not have in mind simply an intellectual prehension, but rather understanding in its emotional affective sense : the kind of understanding that leads an attitude of friendliness. An " understanding " (in first sense) of the motivation and ideology of Nazism, example, would not necessarily involve " understanding " of the type with which the Tensions Project concerned. I shall return to the relation between se two varieties of understanding.

Secondly, what do we mean by " tensions " ? Psychologists are of course familiar with this term in the field of motivation, where it is often used as the equivalent of any unstable psychophysical state leading to action. In this sense tensions are normal, universal, inescapable. For present purposes, I would suggest that we are interested in tensions as states of strain, leading to action, commonly of an aggressive or hostile character.

Thirdly, tensions in whom, and where ? At one of the international meetings held by the Tensions Project, it was pointed out that this had never been fully clarified. The suggestion was made that at least three major varieties or levels of tension could be distinguished : (1) those within the individual ; (2) those within the group or nation : and (3) those between nations. It was urged further that if all of these—intra-individual, intranational, and international—tensions are important, we must show how they are interrelated and how they influence one another. Our major concern is naturally with the third group, international tensions : the others are, for present purposes, important only in so far as they affect these. As I shall try to show, these interrelationships are important and unmistakable, but their precise nature and extent require much more study before they can be completely appreciated.

Fourthly, we are asked whether we mean tensions in people generally, or in the leaders. " Wars begin in the minds of men," says the Unesco preamble ; but, whose minds ? What men ? The fact that most men clearly do not want war has sometimes led to the conclusion that the study of the minds of " most men " is irrelevant in this connexion. This conclusion appears to me unjustified. Granting that most men do not want war, they do want a number of things—security, national prestige, economic gain, a " way of life "—which they may believe they can obtain only through war. Believing this, they may think war evil yet also think it necessary. Leaders are important, of course, but they must have followers, and therefore followers are important too. The minds of leaders *and* of followers must equally be considered.

I shall turn now to an account of some of the activities which we have started, or are planning to start in the near future.

DIFFERENCES IN NATIONAL CULTURES

Pursuing the inquiry into differences in national cultures (or what has sometimes been called national character), we decided eighteen months ago to obtain comparable monographs on the " way of life " of different nations. These monographs are being written by persons of recognised competence, and before publication they must be approved by an editorial committee appointed by the International Studies Conference. They are not based on new empirical research, but bring together in a new synthesis facts and observations which are not always readily accessible. As a general description of national cultures, written by able representatives of such cultures, they constitute a valuable first step which should be useful for purposes of education, and also lead the way to more detailed research.

At a more intensive level, we have arranged for pilot community studies in France, India, Australia, and, probably, Sweden. In each country two small communities—one relatively industrialised, the other relatively rural—will be chosen, and to each community two investigators will be sent, one with his major training in sociology—ethnology, the other in psychology-psychiatry. Besides sociological description of the community, they will be expected also to bring back life-histories and Rorschachs, as well as other psychological protocols. The focus of the study will be on the problem of aggression, and its relation to various social and psychological factors.

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[*] ased on a paper read before the section of psychiatry of the Royal Society of Medicine on Jan. 11, 1949, and on a presidential address to the Eastern Psychological Association at Springfield, Mass., on April 8.

Granting that legal systems are closely integrated with all other aspects of national life, and particularly with the political orientation of a people, problems in the field of comparative law should certainly not be neglected. A first volume of studies has been undertaken, with special reference to the difficulties which arise—between governments, between individuals and governments, and between individuals of different nationality—as the result of the differences in the legal systems of the "common law" countries and those deriving their legal practices and principles from Roman or "Continental" law.

There are many other possible approaches, of which I shall mention only three. First, the use of interview techniques, directed to a representative sample of the population in various countries, appears to have great promise. Granting the difficulties in international research of this type—and they have been amply demonstrated in international studies of public opinion—there are still some areas of interpersonal relationships which lend themselves to this approach. Some of the conclusions of Ruth Benedict regarding the Japanese, for example, or of Geoffrey Gorer regarding the Americans, could and should be tested on a representative sample of the nations concerned; also—and this is equally important—on other nations as well, so that we could determine to what extent the features ascribed to one national culture are peculiar to that culture. Secondly, it would be of great interest to collect and organise the experiences of psychiatrists and psychoanalysts who have practised in more than one country, or whose patients are of different national origin. Finally, the problem of "borrowing" among nations is an interesting one. The books and plays from the United States, for example, that are successful (or unsuccessful) in France and England respectively, may tell us something about the French and the English.

STEREOTYPES

Nations have conceptions or "stereotypes" regarding other nations as well as regarding themselves. To throw light on these an extensive investigation of the "public opinion survey" type was carried out in the United States, France, the United Kingdom, Australia, the Netherlands, Norway, Italy, China, and Mexico. Among the questions asked were:

> "From the list of words on this card, which seem to you to describe the American people (the Russian people, the British, French, Chinese, your own countrymen) best?
>
> Which people do you feel most friendly toward? Least friendly?
>
> Do you think that our (British, American, &c.) characteristics are mainly born in us, or are they due to the way we are brought up?"

Altogether there are 14 questions and they were asked of 1000 respondents in each country. The data are being analysed and prepared for publication by Henry Durant of the British Institute of Public Opinion.

Studies of the stereotypes of children and adolescents are being carried out in England, Switzerland, Belgium, and the Near East.

The controversy as to how stereotypes arise, and whether or not they always contain a "kernel of truth," has not entirely been settled. If—as I believe—some stereotypes do contain such a kernel and others do not, it seems to me highly important to bring home to people the exact nature of the relation between the stereotypes and objective reality. For this reason I see the first two inquiries of the Tensions Project as closely interconnected. On the one hand we need the objective facts regarding national cultures, and on the other the "subjective" facts as revealed in the stereotypes, and a comparison of these two sets of facts to determine the extent of agreement. Closely related to this are the problems of the degree of similarity in the stereo held regarding one nation by a number of other natio the changes in the nature of the stereotype through ti and the relation of such changes to specific econom and political alignments; the interaction betwe stereotypes and attitudes; and the extent to which th stereotypes are really believed.

WAYS OF CHANGING MENTAL ATTITUDES

Our third inquiry—into methods of changing attitud —is the practical core of our project, and also one of t aspects with which I, for one, am least satisfied. T literature in this area is enormous; it is filled wi interesting suggestions, but with little that we c use with confidence in the field of internation relations.

At a conference on the subject held a year ago th delegates expressed approval of the Textbook Proj of the Education Department of UNESCO, and of th attempts to eliminate from textbooks all mater conducive to international hostility; they urged furth the development of textbooks which will show how ev culture has borrowed much of its content from oth nations and other cultures, and the extent to which th whole of mankind is interdependent. We have arrang for the preparation of such a history textbook in th case of France, and when completed it will be sent t historians in other countries as a model for possible wo which they might like to do. But this attempt of ou unfortunately runs counter to a strong tendency ev denced in certain countries today who are claimi credit for all, or almost all, the contributions to ou civilisation.

Another resolution by the conference has to do wi contact as a factor in attitude change. It reads, in pa as follows:

> "The delegates express their support of UNESCO activiti relating to 'exchange of persons,' and urge the expans of the programme of fellowships, visiting professorship &c., as one means of replacing national stereotypes by mo objective experiences; at the same time they suggest th such a programme be combined with a scientific investi tion of the conditions under which 'exchange of persons favours international friendship, and the conditions unde which such contacts have the opposite effect."

We need help in broadening this type of study. In almo all countries there are international contacts of variou kinds and differing duration, through the travel of tourists, students, professors, merchants, diplomats, armies of occupation, &c. What are the effects on th travellers? On the people among whom they travel? In their own nation when they return? How do the effects differ according to the nature of the contact? Its duration? The age at which it occurs? The are only a few of the questions to which we nee answers.

Another suggestion reads:

> "There is need for an accurate and complete descripti of the major tensions and conflicts found in the world tod and of the variations in the nature and intensity of suc conflicts; this may be expressed in terms of a 'world ma and a 'world barometer' of tensions."

Here we felt it advisable to have a survey of the method which can be used for this purpose. We therefore wel- comed the news that the Society for the Psychological Study of Social Issues was planning a volume on The Measurement of Prejudice, and we made a small financial contribution to its preparation.

Another activity in this field which UNESCO is starting is an investigation on the relation between prejudice in teachers and prejudice in children. This study is being conducted by the New Education Fellowship, an international education organisation with headquarters in London.

epeat, we need help in this whole field. I would say we particularly need help as regards the relation een information and attitude change. Much of sco's work appears to proceed on the assumption knowledge about other nations increases friendship at cognitive or intellectual "understanding" means tive or emotional "understanding" as well. The resolution of the Tensions Project dealing with the ledge of national cultures, implies such a causal ionship. This is certainly not always true. When true? Under what conditions? Through the use of media? At what age? I know of no problem more rtant at this stage of our work, or with greater tical potentialities.

CAUSES OF TENSION

ır fourth inquiry deals with the "influences which e for international understanding or for aggressive onalism." Last year a meeting was held of social ltists coming from Brazil, France, Hungary, Norway, United Kingdom, and the United States. The eight ıl scientists present agreed on a general statement on e causes of tensions which make for war," and this ement has been widely distributed and widely ussed. Comments on it have ranged all the way the one extreme of believing that if only the world's ers would take it seriously there might be no more to the other extreme which looks on it as a series of ty platitudes. My own judgment is that it has some importance as an indication that at least on some c points social scientists from the two sides of the n curtain" (or Semi-permeable Membrane) can reach igreement, and that it could be useful as a basis for her coöperation in the future. We are now looking rard to the early appearance of a volume to which ı of these eight social scientists has contributed a pter and which will be published by the University llinois Press under the editorship of Hadley Cantril, ner director of the Tensions Project.

t the meeting of the general conference in Beirut at end of 1948, the Tensions Project received an ruction in the following terms:

> "A conference of experts should be convened to study ıd report on the techniques and devices used to bring bout Fascism in Italy and Germany in the period preceding ıe second world war in order to assist in the early recogni-on of such movements in the future. The results of this udy should receive wide publicity."

rk has already started along these lines.

n this whole area of "influences which make for inter-ional understanding or aggressive nationalism," it ns to me that we should bring together, and if possible end, investigations along two different lines. In the t place, we need to understand the way in which erent societies have, through their institutions, alised, directed, developed, or reduced aggressive aviour, as well as the outlets or substitutes for aggres-ı which they have invented. We would look especially he material available in ethnological monographs or he studies of individual communities by sociologists. the second place, we need to know how, within the ıe society and under relatively similar conditions, ıe individuals develop aggressive behaviour and others not. Here we need especially the help of psychologists l psychiatrists. A great deal of extremely valuable terial is available in both these directions. What is ticularly required is to have such materials more sely integrated. The relation between intra-individual l international tensions, to which I referred earlier, st be approached from both directions at once. ra-individual tensions do often lead to hostility against ıority groups and foreigners, but not always. Why? ernational tensions may be current in a community, but they do not equally affect all individuals. Why? The community studies which we are projecting may give us some insight into this problem, but it can only represent a first step. We need to know—and to do—much more.

POPULATION PROBLEMS

Plans have been developed for the publication of a volume, to be edited by Kingsley Davis of Columbia University, in which several social science disciplines will be represented. Among the chapters there will be one by the French demographer and jurist, Pierre Lambert, which shows the extent to which international tensions are determined, not so much by "actual" population pressure, but rather by "felt" population pressure, and indicates that the two are not always closely related; one by the Belgian sociologist, Pierre De Bie, on the effect of contacts between members of different national populations, somewhat along the lines described above; one by the American historian, Saul K. Padover, on the relation between the ethnic structure of populations and the existence of ethnic minorities, and international tensions; one by the English psychologist and psycho-analyst, J. C. Flugel, on population policies and ideologies. This will be a first survey of the field, but I think it will represent a real contribution. I may add that the Tensions Project is particularly interested in the problem which will be discussed by Padover—namely, the relation between intranational and international tensions—and we are hoping soon to begin a more intensive investigation.

A conference on population problems just held by the International Union for the Scientific Investigation of Population Problems dealt especially with the cultural assimilation of immigrants. Clearly the movements of populations, both voluntary and forced, have very real implications for international relations.

TECHNOLOGY AND MAN

The sixth inquiry is on "the influence of modern technology" on the relationships between peoples. So far we have done almost nothing in this field, but our plans are beginning to take shape.

Modern industrial and technological developments have taken from human beings almost all the satisfaction which formerly went with the accomplishment of a task; they have very largely substituted the reward of money for the reward that comes from the consciousness of work well done. It has been suggested that this denial of what the psychologists of a bygone day called "the instinct of workmanship" means widespread dissatisfaction, and with it a greater tendency toward aggressive behaviour. We may obtain some information along these lines from our community studies, since within each nation we shall have an industrialised and rural community for comparison. My own guess is that the problem of the effect of technology on tensions has often been over-simplified, and that the relation between satisfaction and achievement on the one hand, and aggression on the other, is exceedingly complex.

The programme of President Truman with regard to the economic development of so-called backward areas makes this problem a particularly urgent one.

OTHER UNDERTAKINGS

Some of the other activities of the Tensions Project may be mentioned briefly.

Gardner Murphy, in New York, is making a study of leadership, from which we hope to learn something about the way in which leaders in different countries have risen to important positions, and how some individuals get to be leaders who are later diagnosed as pathological.

David Katz, in Stockholm, is studying the various ways in which individuals are organised into groups having international connexions and implications, often without their being aware of it. This may serve as a first step in the investigation of the relation between national and international identifications and loyalties—a problem of the greatest importance in connexion with the possible future widening of such loyalties.

The Tensions Project is collaborating in a study of the technique of international conferences, and the difficulties and barriers encountered in such conferences.

Two very recent developments seem to me of special importance.

First, we are proposing to collect and publish a number of statements made by recognised scientific organisations in various parts of the world concerning race differences and racial prejudice. These statements, though made during the war in connexion with Nazi racial theories, still have very real pertinence and importance today. We then plan to call together a group of experts to examine these statements, as well as others that will have been collected for that purpose. These experts will be asked to formulate their own statement, either based on those already available or specifically constructed by them. The statement agreed upon by these scientists would then be submitted to Member Governments in the hope and expectation that it might represent a basis for an international declaration concerning race differences and race prejudice.

The Social Sciences Department of UNESCO thinks it of great importance to embark on an "educational offensive" in this area. The public generally believes that race differences are important; race prejudice is widespread. Scientists generally regard race as unimportant, and see no scientific justification for race prejudice. It will be the task of this educational offensive to reduce the gap between popular and scientific knowledge in this respect.

Secondly, the ministry of education of India has informed us of its plans to study tensions in India, and has asked for our coöperation. This is the first time that a Member State has asked the Tensions Project for help in the investigation of tensions within its boundaries. We shall be associated in the over-all planning and organisation of the work, and in the choice of specialists responsible for its integration, and we hope to be of some assistance to the Indian government in locating the major areas of incipient as well as of actual tension. More important, we hope eventually to make some suggestions of a practical nature.

TWO FINAL QUESTIONS

I started with a few questions which we have frequently been asked. There are two others which I have left to the last; they are the most obvious and perhaps also the most difficult to answer in a satisfactory manner.

The first is: what about the greatest tension of all, that between the United States and the U.S.S.R.? What are we doing about that? The U.S.S.R., unfortunately, is not a member of UNESCO, and we cannot bring American and Soviet social scientists together. On the other hand, it is still possible to bring together scientists from the two sides of the "curtain," since Hungary, Czechoslovakia, and Poland are Member States. Relations between "East" and "West" in UNESCO are cordial, and contacts are not only possible but frequent. This is obviously only a second best, but it is better than nothing. We have been thinking of having "neutral" nations make studies of the activities within the two Great Powers which contribute to the increase of tensions—for example, the part played by newspapers and other mass media. So far, I regret to say, we have not been able to carry through this plan, but we have hopes.

The second question is: what about the practical implications of all of this? Is the Tensions Project encouraging research or is it planning action? Our is, of course, research leading to action. There is a and obvious danger in action which is premature; t is an equal danger in delaying action until it is too lat and our major difficulty lies in steering the proper cou somewhere in between. We hope that when our work continued for some time, and when the results of many investigations which have been started can integrated, the practical implications may be m evident.

In one direction we already have a practical accompli ment to which we can point. We have succeeded, think, in bringing social scientists in different count a little closer together. We are at least partially reduc the distance between those countries in which so science is well developed and those in which it is s in its infancy. Nothing has been so sincerely hea warming to me in these few months in UNESCO as t eagerness shown by groups of social scientists and stude in so many places to learn what is happening elsewh and to join in a common undertaking. It is not exa "one world" in the social sciences as yet, but intellect communication is growing somewhat easier, and cont are gradually being established on an increasing sc An ever-widening circle of friends and colleagues working towards the same goal.

This circle must be made still wider. Those who stu man are called upon to help man. This is the challe which we face. In our own individual work, better s in collaboration with those trained in other disciplin and whenever possible with our colleagues in ot countries, we must devote at least some of our time, energy, and our techniques to the problems of int national relations. UNESCO has made a small beginni but it can do very little if it does not have the cooperat of social scientists everywhere.

Now my final question. Can social scientists make real contribution to the peace of the world? There ca be only one answer. Let us try.

INSTITUTE OF DISEASES OF THE CHEST

London's resources for postgraduate teaching ha been developed a stage further by the completion, in th grounds of Brompton Hospital, of new premises for t Institute of Diseases of the Chest. Last week the build was opened by Sir John Anderson, chairman of t British Postgraduate Medical Federation, to which t institute belongs. Teaching is conducted partly the staff of the Brompton and London Chest Hospita which are now administered as a single teaching unit Both have a long and important tradition of teachin and research, as Sir Robert Young and Dr. S. Roo house Gloyne were able to show in brief retrospects a last week's ceremony; but until lately, as Sir Franc Fraser remarked, these and other special hospitals i London have had less than their due place in teaching That this is now being rectified is due to the enterpri of the postgraduate federation, sustained by Londo University and the University Grants Committee.

Nearly half the new building is devoted to research laboratories, where functional and pathological investiga tions will be carried on side by side—an alignment not always achieved in the past. The teaching end of the building includes not only a lecture-room, library, and museum but also a large refectory; there is growing recognition that for postgraduates the value of such a room is not simply, or even primarily, social and nutri tional. Among the smaller attractions is a viewing-box constructed in the nearby hospital, with illumination from a single fluorescent tube, which is covered by frosted 'Perspex'; this gives remarkably uniform lighting.

N ZEALAND MEDICAL SCHEME AMENDED

FROM OUR NEW ZEALAND CORRESPONDENT

·tober, 1949, has seen the passing of two important ndment Acts relating to medicine under social rity. Both were hurried through in the last weeks ie session, and aroused little discussion. Members of iament have all eyes and ears on the general election e held at the end of November this year. On the ome of this there is little confident prediction. Labour Party have held power in this Parliament ı very thin margin, and their handling of the con-)tion issue, waterfront disputes, and other questions alienated some support.

THE MEDICAL PRACTITIONERS AMENDMENT ACT, 1949

he first of the two Acts deals with disciplinary ters in medical practice under social security. In eight years since general medical services were ın there has been no mechanism for dealing with rs and abuses. The new Act remedies this by stituting a Medical Practitioners' Disciplinary Com- tee and divisional disciplinary committees (of 6 nbers in the case of the four main centres, and 3 in ller centres). That the responsibility for discipline been entrusted to the medical profession is shown the facts that all members of all the committees are lical men, and in all cases are appointed by the ncil of the British Medical Association, except 1 nber of the 5 constituting the central committee,) is to be appointed by the minister of health.

he disciplinary committees are to deal with all rges against practitioners—anyone may make the rges—which fall short of grave impropriety or ımous conduct. In the latter case, the existing dical Council remains the appropriate body, and it is) now constituted a "higher court" to which appeals m the disciplinary committees go. Above the Medical ıncil remains, as at present, the Supreme Court. e disciplinary committee may fine up to £100, censure, order payment of costs of inquiry. The fines, queerly, to be paid to the B.M.A.: but this appears to be t of a plan to secure maintenance funds for the ıduct of these inquiries, though government responsi- ity for such funds is in part acknowledged. The nmittees are to regulate their own procedure subject any rules made by the Governor-General by Order in ıncil. The Medical Council remains much as before. may now fine up to £100 (formerly £50) and move the preme Court to remove a name from the register as fore.

These provisions are necessary and long overdue, and the whole have been fairly planned. How far they ll be able to cope with the admitted abuses of a ıeme which in some of its essential features is prone error, remains to be seen.

THE SOCIAL SECURITY AMENDMENT ACT, 1949

Part 1 of the second new Act deals with the rates of e following monetary benefits: superannuation, age, dows', orphans', invalids', sickness, unemployment, d miners'. In general these are all raised by about % from June 1, 1949.

Part 3 deals with medical services, and is to come into rce on a day to be appointed by the minister of health. he chief provisions are:

1. There is to be a prohibition of simultaneous practice ıder capitation and fee-for-service.

2. The refund system hitherto approved by the B.M.A. is t to apply unless specially authorised by the association ter consultation with the minister.

3. Power is taken to establish the specialist services under regulations with a recognised scale of fees and a list of recognised specialists, and provision for determining what constitutes a specialist service.

4. The right of medical practitioners to recover fees at law is restored. The disciplinary committees may be used as referees by the courts in such disputes.

It will thus be seen that some attempt has been made to implement the recommendations of the Joint Committee on Medical Services.[1] The major issue—specialist services—is left to regulations.

Medicine and the Law

Royal Cancer Hospital Reprieved

THE Court of Appeal has reversed the decision of Mr. Justice Harman respecting Mrs. Kellner's bequest to the Royal Cancer Hospital of one-eighth of the residue of her estate. The learned judge had ruled that the operation of the National Health Service Act, 1946, had brought to an end this charity which Mrs. Kellner had intended to benefit. Voicing some vigorous comments on the work of the Parliamentary draftsman, he held that the Act omitted to provide for the destination of such a legacy and that the gift must be deemed a valid charitable bequest and must be administered by the Crown under the Sign Manual.[2]

The Court of Appeal considers that the hospital, which was incorporated by royal charter in 1910, has not been dissolved by section 78 (1) (c) of the Act. That section enacted that "governing bodies of voluntary hospitals transferred to the Minister by virtue of this Act, whose functions wholly cease in consequence of this Act" should be dissolved as from July 5, 1948, when the Act was brought into force. This did not dissolve the Royal Cancer Hospital, but merely abolished its old committee of management. The draftsman, said the Master of the Rolls, had not been so negligent as the trial court had suggested. The case was precisely covered by section 60 (1) (a) of the Act whereby trustees can make payments "in the case of a hospital designated as a teaching hospital . . . to the Board of Governors of that teaching hospital." The Court of Appeal decided that Mrs. Kellner's executors must apply the appropriate fraction of her residuary estate for the purpose of making payments to the board of governors of the hospital in accordance with the terms of section 60.

Thus the Royal Cancer Hospital, over which Mr. Justice Harman had pronounced sentence of death, is reprieved. Section 77 (1) of the 1946 Act empowered the Minister to amend or repeal any charter which might appear to him inconsistent with the new Act or redundant in consequence of its operation. The Minister has not exercised that power; consequently the corporate body remains undissolved.

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[1] See *Lancet*, 1948, ii, 735.

[2] See *Ibid*, 1949, i, 882.

". . . We know that poverty and hardship, danger and pain, are more favourable to character than riches, ease, safety and unfailing health: and, what is less well recognised, often more favourable to happiness too. Circumstances stick a pin into a human being, sometimes a very big one; then if his reaction is sound he is the better for the experience. Physical illness, financial catastrophe, national disaster, by such things as these men and women are probed. . . . Such men and women are strengthened and find happiness by the gallant exercise of faith and resolution in the face of great disappointment. They are "making good"; and that can be making good spirit in a real creative sense, with an effect on the balance of good and evil in circulation."—A SURGEON, at a Conference of Hospital Chaplains, 1949.

In England Now

A Running Commentary by Peripatetic Correspondents

SOME of the migratory movements of birds act as sensitive indicators of the weather, especially of the average temperature. One of these is the southward trend of the black-headed gulls in autumn to the Thames, where they stay till the next spring, when their disappearance to their breeding-sites is thought to be governed mainly by the effect of the increasing amount of daylight on their gonads. (These birds must not be confused with the black-backed gulls, which are always with us in London.) Last year the black-headed gulls had established themselves in strength along their beat between Westminster Bridge and Charing Cross by Oct. 1. This year, except for half a dozen forerunners, they did not arrive until Oct. 28, when at least forty were counted through the thick fog. Since these birds, unlike the immigrant starlings which possibly inform us of the weather in the Baltic area, come chiefly from other parts of the British Isles, their late arrival this year confirms the fact that the average temperature in our islands has been warmer than usual during the past month or so. It does this better than the amount of sunshine, which you show bears little relation to the incidence of poliomyelitis (p. 808), for the amount of sunshine obviously gets less and less as the "evenings draw in" and is no true indicator of the temperature.

* * *

Replete with horror stories and phenobarbitone, twelve of us presented ourselves at Upper Heyford for training as an R.A.F. Medical Parachute Rescue Team. An introductory talk informed us that when we had completed the course we would not be entitled to any parachute badge; that the six sisters and W.R.A.F.s, by virtue of their sex, would earn two-thirds of the jumping pay of the men; that everyone was very pleased to see us; and that the Army trainees had been briefed to pretend that it was entirely natural for girls to throw themselves out of aeroplanes and they needn't therefore expect to be stared at.

Four days were spent in training us for our first jump; days in which through constant repetition we learnt to react automatically to the words "Green on—GO." In these four days, dressed in our "suits combination drab," we were taught to land from ever-increasing heights; graduating via the swings, Leo's Leap, and the Fan to the eighty-foot Tower. The Fan is by far the worst piece of training apparatus. It consists of a series of small cubicles in the training hangar roof reached by climbing a vertical ladder 30 feet high. After clipping on a harness, one then tries to leap smartly out, seemingly on top of the upturned faces of one's waiting colleagues, the fall being broken by the harness wire unwinding from a drum against the resistance of a two-bladed fan.

Our first jump was graced by the presence of the B.B.C., complete with microphones and a reporter who went up in the cage with us. Having been told in the strictest confidence, at noon, that we were to jump at two, your correspondent spent an anorexic lunch watching the two sisters tucking in. The ascent in the balloon was rapid and we were kept well occupied by our dispatcher. The worst moment by far was when we stopped climbing and the balloon floated silent and stationary, 700 feet up. For the last time the dread phrase "Well, let's have you first, Doc" was heard. Standing in the door I was amused to see a very pale reporter watching me, and then I became distinctly annoyed at having placed myself in such an absurd position. Shortly afterwards I was amazed to find that four days' training had been sufficient to make me step into space and remain stiffly at attention. As I fell I watched a lorry going along a road beneath me rapidly increasing in size and was ashamed to feel the proverbial wave of fear pass up my body and exit as a groan. The canopy developed without any jerk and with a comforting thwack of nylon about three seconds after I had jumped. I spent the next twenty seconds having a good look round, listening to the instructor talking over the loud hailer, and blessing my parachute-packer. After the earth had come up and hit me I waited for the rest my stick to land before we all went off for a cup of N tea; a fluid which is usually considered somewhat but which on this occasion tasted like nectar.

One more balloon jump and several from aircr spread over the next few weeks completed our trainin There was a casualty-rate of two—one male refusal the second jump and a first-degree Pott's in a femin ankle on the last jump. The last two jumps were d with full kit. Everyone jumped with a chest p containing their personal kit, while the men, in additi jumped with all the medical stores in kitbags (weigh 50–60 lb.) strapped to their right leg. The tents, fo supplies, and other heavy stores were delivered in co tainers in a subsequent drop. After a few ground schem we found we could get a small tented hospital ready casualties within half an hour of the team leader jumpi from the aircraft.

The outstanding impression one gets of the train station is that everyone treats jumping as the m natural thing in the world, and the enthusiasm is s that all the station personnel from the command officer down to the smallest boy behind the officers' try to get in as many jumps as can be arranged. O instructors, with literally hundreds of jumps to th credit, were first regarded as demi-gods; but they rapid resolved into "Nobby" and "Jock"—two people wi infinite patience and an amazing capacity to anticipa and thereby dissipate our fears. We in our turn we able to render somewhat similar service, since they bo became fathers during our training time.

* * *

Your peripatetic correspondent, who *religiously* sca first "In England Now," and next the examinatio results to see who have outstripped him in the race fame and multiple diplomata, has been much impres by the high percentage of passes obtained by candida from overseas. On proceeding, however, to a statistic analysis, he finds that the percentage is not as high it seems at first sight. In the random sample: Mah rajah-di-Rajah Sri Bahadur Ram Singh Dhobiwalla Sahib, Ubanga N'Gonga Adenoma, Mohammed Abd Hassan Ali el-Gezira, and T. Brown, the percentage home-grown names is not, as might be supposed from cursory glance, 1%, but 25%. This finding leads o to reflect on the reasons for the relative as well absolute paucity of home-grown names, or autochthonou cognomina. Hitherto the practice of inserting Christia names in full has been reserved for the female in the islands, possibly in order to obtain an apparent increa at the expense of the male; but it might well be extended in the interests of national solidarity, to the male als J. Smith would then blossom as John Smith—a 50% increase. The alternative, to deprive foreign candidates of the right to have their names printed in full, is unthinkable. For one thing, nobody knows which is surname in the list; and for another the decline in prestige from Ilkla Moorbah Tat to I.M. Tat would be disastrous. Some candidates, however, have names which are æsthetically unsound whichever way one looks at them—e.g., O Tin Hat. These might well be excluded from the examination in the first place, and practical step would thus be taken towards the desired objective of increasing the possible percentage of humdrum or autochthonous cognomina aforesaid in the pass list, if only by decreasing the opposition. A few odd English names might have to be barred too, in the interests of fairness, but not, of course, *mine*.

* * *

We can't let our peripatetic colleague from the Persian Gulf get away with his of Oct. 22, can we?

It is hardly quite rait
To rhyme "late" with "Kuwait";
But here's the more serious fehling:
Sugar rations for two,
Wouldn't shift it from blwo,
Unless he were grievously ehling.

And surely in my day Fehling's solution turned from blue to yellow to brown, and it was Benedict's that turned red.

Letters to the Editor

THE DISTINCTION AWARDS

R.—I agree with much that has been said by the s of the merit awards scheme. The task of assessing merits of one's colleagues is as distasteful as it is ult, and when the various bodies representing the ssion accepted the scheme they were unaware of its iled implications. But if we neglected to inform elves of those at the time we must accept at least of the responsibility for the omission, and we cannot pe from the facts that the profession did agree oöperate, and that the task is beyond the unaided ers of the central committee.

y object in writing this letter is to suggest that e important aspects of the scheme have been over- ed by its critics and too little stressed by its defenders. new procedure should not be condemned until it been viewed against the background of the vast al changes in which for better or for worse we are all, y-nilly, involved, nor until the alternatives have more consideration than they have hitherto received. his is not the place, nor have I the qualifications, liscuss all the causes of our present social condition : it is obvious that they are extremely complex, that the current reorganisation of medicine in this ntry is the resultant not only of our existing political ntation but also of the course which the evolution of lical science has taken, of the consequences of two ld wars, and of the effects upon our national finances world-wide economic developments which were the ction to our own industrial revolution. These changes ear to be to a large extent irreversible, and it is ikely that the present structure of medical organisa- n will be substantially altered, whatever political party in power. The future of private consulting practice ncertain, but it seems probable that most consultants l in future be increasingly dependent upon the payments they receive for their hospital work. If this be ceded, consultants' salaries are not only of concern themselves but through their economic effects will foundly influence the development of medicine.

No-one seems to have suggested that all consultants uld be paid alike, irrespective of their personal alities and experience. The only question at issue how varying financial rewards should be allotted. e Government proposes to base the awards upon assessment of personal merit, and this fact in itself s important implications which may well extend yond medicine. A common complaint, often made th some justice, against current political trends is at they tend towards an egalitarianism which stifles itiative and depresses all to the level of the lowest. is surely of great significance, therefore, that the present overnment should have recognised that differences professional merit exist and that financial rewards ould correspond to them. It would indeed be rash if e medical profession did anything to undermine ch an important economic principle.

How, then, are the different financial rewards to be llotted ? The main alternatives proposed are three : l) by age and length of service : (2) by grading appointments instead of individuals : and (3) by some method f personal assessment.

(1) It is generally admitted that the first method does othing to encourage initiative and individuality. The ashionable study of geriatrics has provided no evidence n favour of gerontocracy. Moreover even this simple ormula leads to a pitfall which seems to have been verlooked. If either age or length of service is to be the ole determinant of salary it will be necessary to pay all onsultants in the service on the same basis whatever heir appointment. Thus the consultant at Much-Binding-in-the-Marsh hospital will be paid at the same rate for his hospital work as the teaching-hospital physician or surgeon if they are of the same age, and through sheer weight of numbers men of average ability will take the bulk of the highest awards. Is this in the interests of medicine, and is it what advocates of this method of determining payment really intend ?

(2) At first sight the grading of appointments instead of individuals looks seductively simple, but I doubt if those who propose this have thought out what it involves. How are hospital posts to be graded, and what criteria are to decide how many of the different grades of consultant are to exist at a teaching hospital, a non-teaching hospital, a special hospital, a mental hospital, a sanatorium, and so on ? The merits of hospitals are the products of the merits of their staffs : to grade such appointments, even if it could be done fairly, would only be an oblique and collective way of assessing the merits of the doctors concerned. But such an assessment, based on the present status of hospitals, would be inadequate to the needs of the health service. *In many areas it is desirable to raise the efficiency of the consultants.* This is not likely to happen if local hospital appointments are to be graded by their present status, but it would be equally undesirable to upgrade the posts above the level of their existing holders and before it is certain that they can be suitably filled. The Spens Committee's method not only offers an encouragement to the holders of these appointments to upgrade themselves by their own efforts, but also guarantees that if a good man accepts such a post he will carry his higher salary with him. This is particularly important in the case of whole-time appointments. The whole-timer has long suffered from financial handicaps in comparison with his part-time colleague, and even now these have not been entirely removed. Nevertheless in future, wherever he is in the health service, he will have a fair chance of receiving an equal reward for his achievements.

(3) The third choice—assessment by personal merit—is admittedly unpleasant and difficult, but there is no more prospect of an easy course for medicine than for the nation. I hope that consultants will carefully consider all the alternatives to the merit awards scheme and ask themselves whether any of them is practicable. If not, I believe it is better for our profession to try to make the scheme work than to adopt the supine attitude of non-coöperation advocated by its critics.

London, W. 1. W. RUSSELL BRAIN.

SIR.—I am informed that I erred in stating last week that the Awards Committee was chosen by the Minister of Health, and that in fact its members are nominees of medical bodies. I apologise for this mistake, but having done so, am fain to admit that the true facts as to the origin of the committee do not reconcile me to its purpose or its procedure.

London, W.1. F. M. R. WALSHE.

⁂ The committee was appointed by the Minister of Health and the Secretary of State for Scotland. Of its 14 members 11 were nominated by the Royal Colleges and Scottish Royal Corporations, 1 by the Medical Research Council, and 1 by the universities' committee of vice-chancellors and principals. The members are : Lord Moran, P.R.C.P. (chairman), Sir Horace Hamilton (vice-chairman), Mr. Zachary Cope, F.R.C.S., Prof. G. B. Fleming, P.R.F.P.S., Sir Gordon Gordon-Taylor, F.R.C.S., Mr. J. M. Graham, F.R.C.S.E., Sir David Henderson, F.R.C.P.E., Sir Edward Mellanby, F.R.C.P., F.R.S., Sir John Stopford, F.R.C.P., F.R.S., Sir Harry Platt, F.R.C.S., Prof. A. L. Robinson, F.R.C.O.G., Dr. J. H. Sheldon, F.R.C.P., Sir Lionel Whitby, F.R.C.P., and Mr. J. M. Wyatt, F.R.C.O.G.—ED. L.

SIR,—Professor Thomson's letter last week contains an interesting idea for dealing with the knotty problem of distinction awards; but the method suggested is by no means original. *This method of drawing names* out of a hat was practised extensively by assessing committees in many regions.

I suggest that the medical profession should pass away the quiet winter evenings by playing a new card game. Two packs of cards—one pack with names of doctors printed on it, the other cards bearing one of the many titles now in vogue—should be printed. Each pack is shuffled and placed in a hat. Cards are drawn and compared. The game is called "anomalies."

Birmingham. F. E. D. GRIFFITHS.

SIR,—*I note with interest that* Professor Thomson, in his letter last week, says: "An Englishman will accept misfortune in a lottery with good grace and good humour, but he will resent deliberate classification in a grade inferior to that of a colleague as an injustice." He makes this statement about the English in support of his suggestion that, except for a few superlative individuals whose claims to eminence are unimpeachable, the matter should be decided by a lottery.

It is not unnatural to wonder whether this point of view has any relevance to some of the results which emerged in the main grading, and which could be easiest explained by the operation of a lottery. If this could be so it seems a pity that those senior hospital medical officers who are now *languishing in bewilderment and* the distress of being made deliberately inferior to their colleagues, were not given this comforting explanation of their misfortune, so that those of them who are Englishmen could now begin to exercise their prerogative of behaving as such.

BIRMINGHAM REGIONAL S.H.M.O.

FACIAL PARALYSIS AND POLIOMYELITIS

SIR,—In his valuable report of Sept. 17, Dr. Stapleton concludes that "though there is a suggestion that the cases of facial palsy unaccompanied by other paralysis had a cause in common with the cases of poliomyelitis, this hypothesis is not, of course, proven."

During large-scale epidemics of poliomyelitis, instances of uncomplicated unilateral paralysis of the face are by no means rare. Epidemiological observations bearing out the relationship have been supported by laboratory confirmation. Thus Steigman and Sabin[1] refer to a 7-month-old infant whose only paralysis involved one side of the face. Poliomyelitis virus was isolated from her alimentary tract, and antibody to the homologous strain of virus appeared in convalescence.

Facial "paralysis" is perhaps a better term than the time-honoured facial "palsy," at least for those cases where clinical and epidemiological evidence suggests *poliomyelitis virus as the cause.*

New York. ALEX J. STEIGMAN.

VENTRICULAR FIBRILLATION

SIR,—Dr. Robertson (Oct. 29) doubts the presence of ventricular fibrillation in the electrocardiogram recorded in my case-report (Oct. 15) because of the "absolute regularity of the aberrant complexes." I can assure him that my diagnosis was based on the very fact that the complexes are *not absolutely regular and show* definite variations in form and amplitude from beat to beat in those phases of the record referred to in the *report as fibrillation.* These variations can quite easily be seen in the published reproduction of the E.C.G., but I admit they are clearer in the original record which is not now in my possession; I believe that Dr. Robertson would have been convinced had he seen this.

Leamington Spa. W. M. PRIEST.

MANTOUX-CONVERSION

SIR,—*There is a place in the English* language f term to indicate a change from the tuberculin-ne state to the tuberculin-positive state, but the use two different terms with this meaning leads to co In the American and English literature the term " toux-conversion" is used to indicate this change, some Scandinavian writers have preferred the "Mantoux-inversion" and recently one English has followed them.[1] To the ordinary English re "conversion" clearly indicates a change from a *state to a* newly acquired one, while "reversion equally clearly indicates a change from an acqu state to a pre-existing one. "Inversion" suggests mer a "turning upside down," with no implication as the *nature of the change.*

For the sake of clarity and uniformity, therefore would be preferable for all writers on tuberculosis to "Mantoux-conversion" to indicate the change from tuberculin-negative to the tuberculin-positive state, shown by the Mantoux technique; Mantoux-rever is the correct term to indicate the change from tubercu positive to tuberculin-negative. I am sure that Scandinavian friends, who have such a remarkable enviable command of our *language, will be* willing drop the term "Mantoux-inversion," which has no etymological justification for use in the sense it acquired.

CHARLES NEWMAN
Chairman, Prophit Tuberculosis Survey Committee,
Royal College of Physicians.

THE M.O.H.

SIR,—Both Dr. Brockington *and* Dr. H. C. Mau Williams speak despondently about the future of pu health (Oct. 22, pp. 759 and 755), and yet in indust health is a great region of *public* health which is alm untouched. The problem is the environmental hygie of the small factory. Most people are employed in sm factories, many of which have deplorable standards, a the medical inspectorate, good though it is, is spread to thinly *to* produce much improvement. Why not medical supply match industrial demand *and* use th only sizeable body of men trained in preventive medici to raise the level of industrial hygiene? This woul provide an industrial health service where it is mo needed, at little extra cost in money or medical man power.

Medical School, King's College,
Newcastle-on-Tyne, 1. R. C. BROWNE.

VASCULAR STASIS

SIR,—In his letter of Oct 22, Dr. Shubsachs impli that my use of the term "whole-skin loss" in burn synonymous with blister formation. In so doing h *misunderstands* what is meant by the term "whol skin loss." This means more than mere epiderm destruction: it means that death of the epithelial el ments (follicles, glands, and ducts) has occurred throu out the whole depth of the dermis and that regeneratio of epithelium can only take place from the epidermis surrounding the burn.

In my letter of Oct. 15, I attempted to draw attention to the fact that stasis of the dermal blood-flow may *occur in burns, and that if it* develops through the depth of the dermis it is followed by necrosis of the dermal epithelium. In such a burn epithelial regeneration *from the dermis is impossible*—in other words, whole-skin loss has developed.

From Dr. Shubsachs's own description of the blister burns which he has treated with anti-histamine drugs, in which rapid epithelial regeneration from the dermis s, it is clear that only the superficial elements of the (epidermis and possibly the most superficial portion e dermis) had suffered irreversible heat changes. ich burns epithelial regeneration from the underdermis *normally* takes place fairly rapidly, and the d area is re-covered with epithelium in 7 to 14 days. e is no reason to assume that the anti-histamine s had any effect whatsoever. Such burns correspond puytren's grade 2, and in this unit would be called ficial partial skin-loss burns.

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[1] Steigman, A. J., Sabin, A. B. *J. exp. Med.* 1949, 90, 349.

[1] Irvine, K. N. B.C.G. Vaccination in Theory and Practi *Oxford, 1949.*

R.C. Burns Research Unit,
ngham Accident Hospital.
S. SEVITT.

LIGUE INTERNATIONALE CONTRE LE RHUMATISME

R.—The recent International Congress on Rheumatic ses in New York, at which Hench and Kendall nted their paper on 'Cortisone,' was sponsored by Ligue Internationale contre le Rhumatisme, and e can be no doubt in the minds of those who heard paper and availed themselves of the varied oppories at this congress, of the immense value of such ings.

e feel that the British branch of the Ligue is not ently widely known, and that membership offers only individual advantages but an opportunity to r friendly international relations at the various erings held in different countries. The next congress e Ligue Européen is in Barcelona in 1951, and the le of the Ligue Internationale will meet in Zurich in . Judging by the high standard of papers in New k this year, these two promise to be important tings.

dividual membership of the British branch entitles ndance at these congresses and also at certain clinical tings of the Heberden Society. The British branch ranging quarterly publication of a pamphlet giving s of forthcoming meetings of interest and of postuate courses, and a list of clinics where postgraduate bers will be welcome.

e annual subscription of one guinea should be sent e treasurer, Dr. G. D. Kersley, 6, The Circus, Bath.

W. S. C. COPEMAN
President Ligue Europeen.
OSWALD SAVAGE
Secretary, British branch of the Ligue
Internationale contre le Rhumatisme.

ACUTE MASTITIS

R.—Mr. Walsh (Oct. 8) refers to the responsibility he general practitioner in the early diagnosis and ment of acute mastitis, and in discussing the logy he mentions cracked nipple as an important r; but leaves one in doubt as to what exactly cluded under this head. Suckling is, or should be, inless process. In cases where the nipple is sore, roscopic cracks may be observed, but one cannot ys find them. That the sore nipple, without obvious ks, belongs to the same class as the cracked nipple ggested by the fact that both respond rapidly to cillin ointment applied to the nipple after each feed.

r. Hogg's letter (Oct. 22) about veterinary experience very interesting. I have never attempted to admini- penicillin directly into the mammary ducts, and problem obviously varies from one species to another. dersheim, in his *Comparative Anatomy of Vertebrates* 7, p. 28), gives illustrations to show the lactiferous ts of carnivora and ungulates opening into the bottom teat canal (it is into this that Mr. Hogg has injected icillin), while in primates, rodents, and marsupials lactiferous ducts open into the apex of the nipple there is no teat canal. Mr. Hogg's concluding rvation, that "the wise farmer nowadays has his icillin ointment always handy for immediate application at the merest suspicion of an abrasion, crack, or sore in the region of the teat orifice," is in strange contrast to the fact that midwives are not issued with penicillin ointment for use in the human subject.

Oulton Broad, Lowestoft. N. B. EASTWOOD.

MEASLES IN LONDON

SIR,—Dr. Breen and Mr. Benjamin, in their article of Oct. 1, maintain that since 1940 "the biennial epidemic rhythm [of measles in London] has disappeared." This might be true without invalidating the general truth as to the persistence of this feature when units of population far transcending that even of London are observed. The discovery of a type may be difficult: it may be a tardy induction based on a group of hitherto unrelated facts or quickly seen in an accidental illuminating flash of vision. But, once established as a more or less permanent feature of distributed phenomena or of recurring events, it is usually easy to recognise. A type may disappear, be transformed in its features, or survive so changed as scarcely to preserve its identity. Dr. Breen and Mr. Benjamin conclude that in London, since 1940, biennial rhythm, in any form hitherto recognised, can no longer be observed.

Controversy during many years has been as to its nature and description rather than as to the fact of the occurrence of biennial rhythm. Its disappearance with the advent of notification of measles in a population so large as that of London would be a noteworthy event. But the evidence on which the conclusion is based, as set out in the paper, is far from convincing: and it is not a little remarkable that it was upon the data from 1940 to the end of 1945, relating severally to London, to London and the great towns, to other towns and areas, and to England and Wales as a whole, that I formulated the thesis of the recurring multiphasic character of biennial incidence in measles.[1] The authors say that "a series of alternate heavy and light years, one year being mainly covered by an epidemic and the next year being mainly interepidemic" is to be observed both in London and New York. This description may be a facile way of distinguishing biennial epidemicity, but, exclusively so used, is little likely to disclose the natural course of measles epidemics. So to describe it is to ignore all but the gross annual numbers or recognise only the high peaks as evidence of epidemics. As I observed nearly three years ago[2]:

> "In the graphs of incidence of recent years there is seen to be comprised within a single span of four-and-twenty months the proportioned phases not alone of epidemic prevalence but also of the low levels of intercurrent sub-epidemicity. Thus seen, periodicity ceases to be a biennial recurrence of punctual maxima and becomes a periodic repetition of like prevalences each in its due season, once within two years."

Serial distribution of cases as they occur shows types of biennial periodicity not properly to be described as recurrences of epidemics in alternate years. And the main conclusion of the authors—that in London since 1940 the biennial epidemic rhythm of measles has disappeared at least temporarily—is not borne out by a detailed survey of the ten years 1940–49. The epidemics of 1940–41, 1942–43, and 1944–45 as shown in the graphs exhibit a biennial periodicity more comprehensive than that of biennially recurring peaks—though these also are to be observed: and while since then what might be regarded as fundamental changes have been noted, these are not coincident with the notification period. As Taylor[3] has demonstrated, measles outbreaks in lesser constituent populations may not conform to the type of incidence observable in the larger inclusive units such as England and Wales.

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1. Butler, W. *Mon. Bull. Min. Hlth, P.H.L.S.* 1946, 5, 81.
2. Butler, W. *Proc. R. Soc. Med.* 1947, 40, 384.
3. Taylor, I. *Mon. Bull. Min. Hlth, P.H.L.S.* 1948, 7, 254.

SIR,—Professor Thomson's letter last week contains an interesting idea for dealing with the knotty problem of distinction awards; but the method suggested is by no means original. This method of drawing names out of a hat was practised extensively by assessing committees in many regions.

I suggest that the medical profession should pass away the quiet winter evenings by playing a new card game. Two packs of cards—one pack with names of doctors printed on it, the other cards bearing one of the many titles now in vogue—should be printed. Each pack is shuffled and placed in a hat. Cards are drawn and compared. The game is called "anomalies."

Birmingham. F. E. D. GRIFFITHS.

SIR,—I note with interest that Professor Thomson, in his letter last week, says: "An Englishman will accept misfortune in a lottery with good grace and good humour, but he will resent deliberate classification in a grade inferior to that of a colleague as an injustice." He makes this statement about the English in support of his suggestion that, except for a few superlative individuals whose claims to eminence are unimpeachable, the matter should be decided by a lottery.

It is not unnatural to wonder whether this point of view has any relevance to some of the results which emerged in the main grading, and which could be easiest explained by the operation of a lottery. If this could be so it seems a pity that those senior hospital medical officers who are now languishing in bewilderment and the distress of being made deliberately inferior to their colleagues, were not given this comforting explanation of their misfortune, so that those of them who are Englishmen could now begin to exercise their prerogative of behaving as such.

BIRMINGHAM REGIONAL S.H.M.O.

FACIAL PARALYSIS AND POLIOMYELITIS

SIR,—In his valuable report of Sept. 17, Dr. Stapleton concludes that "though there is a suggestion that the cases of facial palsy unaccompanied by other paralysis had a cause in common with the cases of poliomyelitis, this hypothesis is not, of course, proven."

During large-scale epidemics of poliomyelitis, instances of uncomplicated unilateral paralysis of the face are by no means rare. Epidemiological observations bearing out the relationship have been supported by laboratory confirmation. Thus Steigman and Sabin[1] refer to a 7-month-old infant whose only paralysis involved one side of the face. Poliomyelitis virus was isolated from her alimentary tract, and antibody to the homologous strain of virus appeared in convalescence.

Facial "paralysis" is perhaps a better term than the time-honoured facial "palsy," at least for those cases where clinical and epidemiological evidence suggests *poliomyelitis* virus as the cause.

New York. ALEX J. STEIGMAN.

VENTRICULAR FIBRILLATION

SIR,—Dr. Robertson (Oct. 29) doubts the presence of ventricular fibrillation in the electrocardiogram recorded in my case-report (Oct. 15) because of the "absolute regularity of the aberrant complexes." I can assure him that my diagnosis was based on the very fact that the complexes are *not absolutely* regular and show definite variations in form and amplitude from beat to beat in those phases of the record referred to in the report as fibrillation. These variations can quite easily be seen in the published reproduction of the E.C.G., but I admit they are clearer in the original record which is not now in my possession; I believe that Dr. Robertson would have been convinced had he seen this.

Leamington Spa. W. M. PRIEST.

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1. Steigman, A. J., Sabin, A. B. *J. exp. Med.* 1949, 90, 349.

MANTOUX-CONVERSION

SIR,—There is a place in the English language term to indicate a change from the tuberculin-ne state to the tuberculin-positive state, but the two different terms with this meaning leads to confu In the American and English literature the term " toux-conversion" is used to indicate this change, some Scandinavian writers have preferred the "Mantoux-inversion" and recently one English w has followed them.[1] To the ordinary English rea "conversion" clearly indicates a change from a state *to* a newly acquired one, while "reversio equally clearly indicates a change from an acqui state to a pre-existing one. "Inversion" suggests me a "turning upside down," with no implication the nature of the change.

For the sake of clarity and uniformity, therefo would be preferable for all writers on tuberculosis to "Mantoux-conversion" to indicate the change from tuberculin-negative to the tuberculin-positive state, shown by the Mantoux technique; Mantoux-rever is the correct term to indicate the change from tuberc positive to tuberculin-negative. I am sure that Scandinavian friends, who have such a remarkable enviable command of our language, will be willing drop the term "Mantoux-inversion," which has no etymological justification for use in the sense it acquired.

CHARLES NEWMAN
Chairman, Prophit Tuberculosis Survey Committ
Royal College of Physicians.

THE M.O.H.

SIR,—Both Dr. Brockington and Dr. H. C. Mau Williams speak despondently about the future of pu health (Oct. 22, pp. 759 and 755), and yet in indust health is a great region of public health which is alm untouched. The problem is the environmental hygi of the small factory. Most people are employed in sm factories, many of which have deplorable standards, a the medical inspectorate, good though it is, is spread thinly to produce much improvement. Why not medical supply match industrial demand and use only sizeable body of men trained in preventive medici to raise the level of industrial hygiene? This wou provide an industrial health service where it is mo needed, at little extra cost in money or medical ma power.

Medical School, King's College,
Newcastle-on-Tyne, 1. R. C. BROWN

VASCULAR STASIS

SIR,—In his letter of Oct 22, Dr. Shubsachs implie that my use of the term "whole-skin loss" in burns synonymous with blister formation. In so doing misunderstands what is meant by the term "whol skin loss." This means more than mere epiderm destruction: it means that death of the epithelial el ments (follicles, glands, and ducts) has occurred throug out the whole depth of the dermis and that regeneratio of epithelium can only take place from the epidermi surrounding the burn.

In my letter of Oct. 15, I attempted to draw attention to the fact that stasis of the dermal blood-flow may occur in burns, and that if it develops through the depth of the dermis it is followed by necrosis of the dermal epithelium. In such a burn epithelial regeneration from the dermis is impossible—in other words, whole skin loss has developed.

From Dr. Shubsachs's own description of the blister burns which he has treated with anti-histamine drugs in which rapid epithelial regeneration from the dermis

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1. Irvine, K. N. B.C.G. Vaccination in Theory and Practice. Oxford, 1949.

s. it is clear that only the superficial elements of the epidermis and possibly the most superficial portion e dermis) had suffered irreversible heat changes. ch burns epithelial regeneration from the under- dermis *normally* takes place fairly rapidly, and the d area is re-covered with epithelium in 7 to 14 days. is no reason to assume that the anti-histamine had any effect whatsoever. Such burns correspond puytren's grade 2. and in this unit would be called ficial partial skin-loss burns.

R.C. Burns Research Unit, ungham Accident Hospital. S. SEVITT.

LIGUE INTERNATIONALE CONTRE LE RHUMATISME

,—The recent International Congress on Rheumatic ses in New York, at which Hench and Kendall nted their paper on 'Cortisone,' was sponsored by Ligue Internationale contre le Rhumatisme, and can be no doubt in the minds of those who heard paper and availed themselves of the varied oppor- ies at this congress, of the immense value of such ings.

e feel that the British branch of the Ligue is not iently widely known, and that membership offers only individual advantages but an opportunity to r friendly international relations at the various erings held in different countries. The next congress ie Ligue Européen is in Barcelona in 1951, and the e of the Ligue Internationale will meet in Zurich in . Judging by the high standard of papers in New this year, these two promise to be important ings.

dividual membership of the British branch entitles ndance at these congresses and also at certain clinical tings of the Heberden Society. The British branch ranging quarterly publication of a pamphlet giving s of forthcoming meetings of interest and of post- uate courses, and a list of clinics where postgraduate nbers will be welcome.

he annual subscription of one guinea should be sent he treasurer, Dr. G. D. Kersley, 6, The Circus, Bath.

W. S. C. COPEMAN
President, Ligue Européen.
OSWALD SAVAGE
Secretary, British branch of the Ligue Internationale contre le Rhumatisme.

ACUTE MASTITIS

IR,—Mr. Walsh (Oct. 8) refers to the responsibility the general practitioner in the early diagnosis and tment of acute mastitis, and in discussing the logy he mentions cracked nipple as an important or; but leaves one in doubt as to what exactly ncluded under this head. Suckling is, or should be, ainless process. In cases where the nipple is sore, roscopic cracks may be observed, but one cannot ays find them. That the sore nipple, without obvious ks, belongs to the same class as the cracked nipple uggested by the fact that both respond rapidly to icillin ointment applied to the nipple after each feed. r. Hogg's letter (Oct. 22) about veterinary experience very interesting. I have never attempted to admini- penicillin directly into the mammary ducts, and problem obviously varies from one species to another. dersheim, in his *Comparative Anatomy of Vertebrates* 97, p. 28), gives illustrations to show the lactiferous ts of carnivora and ungulates opening into the bottom teat canal (it is into this that Mr. Hogg has injected icillin), while in primates, rodents, and marsupials lactiferous ducts open into the apex of the nipple there is no teat canal. Mr. Hogg's concluding ervation, that "the wise farmer nowadays has his icillin ointment always handy for immediate applica- n at the merest suspicion of an abrasion, crack, or sore in the region of the teat orifice," is in strange contrast to the fact that midwives are not issued with penicillin ointment for use in the human subject.

Oulton Broad, Lowestoft. N. B. EASTWOOD.

MEASLES IN LONDON

SIR,—Dr. Breen and Mr. Benjamin, in their article of Oct. 1, maintain that since 1940 "the biennial epidemic rhythm [of measles in London] has disappeared." This might be true without invalidating the general truth as to the persistence of this feature when units of population far transcending that even of London are observed. The discovery of a type may be difficult: it may be a tardy induction based on a group of hitherto unrelated facts or quickly seen in an accidental illuminating flash of vision. But, once established as a more or less permanent feature of distributed phenomena or of recurring events, it is usually easy to recognise. A type may disappear, be transformed in its features, or survive so changed as scarcely to preserve its identity. Dr. Breen and Mr. Benjamin conclude that in London, since 1940, biennial rhythm, in any form hitherto recognised, can no longer be observed.

Controversy during many years has been as to its nature and description rather than as to the fact of the occurrence of biennial rhythm. Its disappearance with the advent of notification of measles in a population so large as that of London would be a noteworthy event. But the evidence on which the conclusion is based, as set out in the paper, is far from convincing; and it is not a little remarkable that it was upon the data from 1940 to the end of 1945, relating severally to London, to London and the great towns, to other towns and areas, and to England and Wales as a whole, that I formulated the thesis of the recurring multiphasic character of biennial incidence in measles.[1] The authors say that "a series of alternate heavy and light years, one year being mainly covered by an epidemic and the next year being mainly interepidemic" is to be observed both in London and New York. This description may be a facile way of distinguishing biennial epidemicity, but, exclusively so used, is little likely to disclose the natural course of measles epidemics. So to describe it is to ignore all but the gross annual numbers or recognise only the high peaks as evidence of epidemics. As I observed nearly three years ago[2]:

> "In the graphs of incidence of recent years there is seen to be comprised within a single span of four-and-twenty months the proportioned phases not alone of epidemic prevalence but also of the low levels of intercurrent sub-epidemicity. Thus seen, periodicity ceases to be a biennial recurrence of punctual maxima and becomes a periodic repetition of like prevalences each in its due season, once within two years."

Serial distribution of cases as they occur shows types of biennial periodicity not properly to be described as recurrences of epidemics in alternate years. And the main conclusion of the authors—that in London since 1940 the biennial epidemic rhythm of measles has disappeared at least temporarily—is not borne out by a detailed survey of the ten years 1940–49. The epidemics of 1940–41, 1942–43, and 1944–45 as shown in the graphs exhibit a biennial periodicity more comprehensive than that of biennially recurring peaks—though these also are to be observed: and while since then what might be regarded as fundamental changes have been noted, these are not coincident with the notification period. As Taylor[3] has demonstrated, measles outbreaks in lesser constituent populations may not conform to the type of incidence observable in the larger inclusive units such as England and Wales.

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1. Butler, W. *Mon. Bull. Min. Hlth, P.H.L.S.* 1946, 5, 81.
2. Butler, W. *Proc. R. Soc. Med.* 1947, 40, 384.
3. Taylor, I. *Mon. Bull. Min. Hlth, P.H.L.S.* 1948, 7, 254.

Taylor further noted that in London in the epidemic of 1946–47 there was a transposition of what customarily would have been the successive minor and major phases. This, together with the epidemic of 1948–49 just terminated (or terminating), may lend some support to the view that at least transiently annual rather than biennial epidemicity has become a feature of London measles. It was anticipated that "the minor phases as such may cease and, if enlarged and separated by definite sub-epidemicity from what follows, be regarded justly as completed epidemics. In that case, of course, biennial periodicity disappears and is replaced by annual recurrences."[2] The two—or, so regarded, four—most recent epidemics in London (1946–47 and 1948–49) may be instanced as illustrative of this anticipation, but it must not be overlooked that anomalies of incidence in London are to be expected.

The exodus of children at the beginning of the war could not fail profoundly to modify the course of measles prevalence in the metropolis. That for 1940–41, for instance, was diminutive; nevertheless, in attenuated form the features dominantly defined in composite graphs of the three epidemics of 1940–41, 1942–43, and 1944–45 are clearly to be traced ab origine. The epidemics of 1946–47 and 1948–49, while retaining anomalously, if regarded as biennial epidemics, the features of such, would if they were characteristically recurrent over a prolonged period be seen, I think, as annual epidemic recurrences. Extensively, during the period of evacuation, children who normally would have contracted measles in London escaped, and with their return have added to the numbers of susceptibles in the metropolis. This change in the immunity constitution of the population, the raising of the fee for notification which has made it worth while for the practitioner to seek out family contact sufferers from the disease, and other circumstances, contribute to such anomalies as those we are now witnessing.

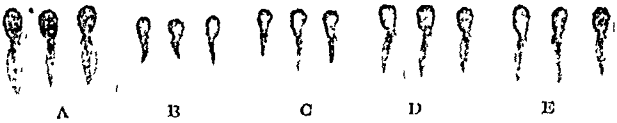
Ministry of Health,
London, S.W.1.

WILLIAM BUTLER.

ÆTIOLOGY OF GRAVES'S DISEASE

SIR,—In his most lucid and stimulating lecture, published in your issue of Sept. 24, Professor Means asks "How actually does thyroid hormone act on cells, and what potentiates or inhibits such action?" and he continues: "To these questions we badly need answers."

The problem of how the action of the thyroid hormone and of other hormones may be modified once they have been released by the glands, was studied many years ago by H. Zondek and myself.[4] The results of these old experiments are, I believe, interesting enough to be briefly recalled.



Tadpoles on 4th day of experiment: A, controls; B, thyroid action at pH 6·5; C, thyroid action on addition of 66 mg. calcium chloride per 100 ml. water; D, thyroid action on addition of 200 mg. calcium chloride per 100 ml. water; E, thyroid action at pH 7·4.

Using the metamorphosis of tadpoles as a test for thyroid hormone, we found that comparatively slight changes of the pH of the water in which the tadpoles were kept modifies thyroid action. Metamorphosis took place much more rapidly at a pH of 6·5–7 and of 7·7–8·5, than at a pH of 7–8 and below 6·5; and we concluded that the changes in hydrogen-ion concentration, as they occur in the body and between blood and tissues, may perhaps cause variation in hormonal response. Previously, Zondek and Reiter[5] had obs addition of small quantities of potassium and calcium enhanced and inhibited, respectively, the influence of hormone on the metamorphosis of tadpoles. The figure, taken from our own experiments, illustrates the act thyroid hormone on the metamorphosis of tadpoles calcium chloride is added to the water and when this is t at a pH of 6·5 and 7·4.

Similar observations were made with respect to hormones. Zondek and I[6] found that addition of quantities of calcium chloride to insulin diminished and times even reversed the action of insulin on the blood sugar. McCarrison[7] described modification of the action adrenaline by alteration of the pH, and Kylin[8] observ similar changes on addition of potassium and calcium salts.

Thus it appeared that variations in the concentrati of hydrogen ions and of certain electrolytes mi modify hormonal action.

London, W.1.

H. UCKO.

INTRAVENOUS IRON IN RHEUMATOID ARTHRITIS

SIR,—I was interested to read the results reported Dr. Sinclair and Dr. Duthie in your issue of Oct. 8.

Early this year I gave several patients with long-stan ing active rheumatoid arthritis a course of intraven iron ('Ferrivenin,' Benger). The general régime much the same as that of Sinclair and Duthie.

So far I have detailed results in only 3 cases. Ea of these patients had been under observation for at le a year, during which they had been taking iron regula by mouth. In no case was the anæmia very pronounc and the intravenous iron was given in the hope th apart from raising the hæmoglobin level to normal, would produce more general improvement which co be measured by means of the erythrocyte-sedimentat rate (E.S.R.). Hæmoglobin was estimated by Haldane method; and the E.S.R. at the end of one h by the Westergren method.

CASE 1.—A man, aged 40 years, who had had psori arthropathica for the past 6 years.

Date	*Hb*, %	*E.S.R.*, *mm.*	*Intravenous iron*
Nov. 17, 1948	92	39	—
Jan. 10, 1949	82	10	—
Jan. 10–29	—	—	1370
Feb. 7	90	13	—
Feb. 25	94	16	—
June 2	78	64	—
July 14	80	60	—

CASE 2.—A man, aged 31 years, with a history of rheuma arthritis for the past 3 years.

Date	*Hb*, %	*E.S.R.*, *mm.*	*Intravenous iron.*
July 5, 1948	102	86	—
Dec. 31	80	71	—
Jan. 10, 1949	88	64	—
Jan. 10–31	—	—	1470
Jan. 25	88	62	—
Feb. 7	92	52	—
Feb. 16	98	66	—
May 26	86	71	—
Sept. 16	92	89	—

A total of 1 g. of 'Myocrisin' was administered between July October, 1948, and a further 1 g. between May and July, 1949.

CASE 3.—A man, aged 33 years, who had had rheumat arthritis, associated with fairly severe bronchiectasis, for 7 ye

Date	*Hb*, %	*E.S.R.*, *mm.*	*Treatment*
March 25, 1948	76	50	—
March 26	—	—	Blood-transfu 600 ml.
March 30	82	36	—
April 15	92	22	—
July 29	98	19	—
Jan. 20, 1949	76	55	—
Jan. 29 to Feb. 11	—	—	Intravenous ir 1280 mg.
Feb. 16	82	55	—
March 30	80	52	—

The bronchiectasis was treated during this time postural drainage and aerosol penicillin inhalations.

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4. Zondek, H., Ucko, H. *Klin. Wschr.* 1924, no. 29, p. 1752.
5. Zondek, H., Reiter, T. *Z. klin. Med.* 1923, 99, 139.
6. Zondek, H., Ucko, H. *Klin. Wschr.* 1925, no. 1, p. 6.
7. McCarrison, R. *Brit. med. J.* 1923, i, 101.
8. Kylin, E. *Klin. Wschr.* 1925, no. 11, p. 501.

is in these 3 cases the disease became no less active, dged by changes in the E.S.R. All the patients, ling these 3. said that they felt much better and had ain in the joints while treatment with intravenous iron eing continued and for about a fortnight afterwards. difficult to say how much of this symptomatic vement was due to the psychological effect of a new nent. On no occasion were any toxic effects noted.

ish to thank the Director-General of Medical Services, ry of Pensions, for permission to publish these cases.

stry of Pensions Hospital,
Ronkswood, Worcester.

A. M. Clark
Medical Officer.

CONTROL OF TUBERCULOSIS

t,—I doubt whether, under the existing circum- es, many chest physicians will feel able to accede r. Temple Clive's request, in his letter of Oct. 22, their patients should be admitted to sanatoria conditioned" by bed rest only.

ny patients have to wait up to six or nine months e being admitted to a sanatorium, and during this d *not a few progressively deteriorate despite* bed which in many cases cannot be properly applied e patient's own home. Does Dr. Temple Clive usly suggest that these cases should not receive benefit of collapse therapy or of treatment with tomycin or para-aminosalicylic acid when they are he earliest, and therefore most treatable, stage? Temple Clive states that the results of domiciliary pse therapy have not been *uniformly* successful, collapse therapy instituted in a sanatorium is also ccessful in many instances; success in this field nds more on selection of the right type of case on whether treatment is instituted in the home or sanatorium.

long as there are not sufficient sanatorium beds the treatment of the tuberculous it is up to the t physician to treat his patients as best he can as as he can, and to this end the use of domiciliary pse therapy appears to be entirely justified. More- t, the suggestion that it is dangerous for the chest sician to treat his cases in the patients' homes, ther by collapse therapy or with streptomycin or a-aminosalicylic acid, is unfair to the ability of the st physician, who is quite as able to assess his patients to plan their treatment as is the sanatorium physician.

odsham, Cheshire. M. B. Paul.

IR,—In his letter of Oct. 22, Dr. Temple Clive warns that domiciliary collapse treatment in pulmonary erculosis should not be undertaken lightly. I should to support his warning most strongly.

omiciliary collapse treatment, like any other treat- nt, can only give good results in experienced hands l if all the necessary facilities are available. In my nion this treatment should only be undertaken if the owing conditions obtain: (1) careful selection of es; (2) adequate provision for the care of the patients home, including home help if necessary; (3) a chest ysician constantly on call to deal with emergencies; adequate facilities for adhesion-section and for renic crushes; and (5) a reliable transport system convey patients from their homes to the clinic for ills and X-ray control, and, if necessary, to institutions minor surgery.

I think, however, that domiciliary collapse treatment s come to stay, until the time when it will again be ssible to admit tuberculous patients to hospital without uch delay.

Since 1945 I have induced in the Hounslow chest- inic area nearly 300 pneumoperitoneums and artificial neumothoraces in the patients' homes. A preliminary port on the first 200 cases has lately been published,[1] and I think that the results certainly bear comparison with the results of institutional treatment.

I should like to plead for the more frequent use of the pneumoperitoneum as a preliminary collapse measure, especially as this will give satisfactory results even in less experienced hands and where there are less facilities for minor surgery and frequent X-ray control.

Hounslow, Middlesex.

R. Heller
Chest Physician.

NIPPLE-SHIELDS

Sir,—Your correspondents who advocate the use of lead nipple-shields are, unhappily, following in the footsteps of those who have from time to time made thorny the path of preventive medicine.

The first principle in the control of poisoning by specific agents is replacement of the toxic material by one that is harmless, and the arguments adduced in favour of lead shields have a familiar ring to those who recall the struggle of the last half-century to reduce the toll of industrial disease. One of the reasons for the great reduction in the incidence of lead-poisoning among industrial workers since 1900 has been the successful adoption of this principle. At one time lead was an essential ingredient of glazes, and the pottery industry was notorious for its lead-poisoning. Now, leadless glazes have been found to be so successful that their use has been prescribed by law. This is but one example of many that could be mentioned.

The use of lead in occupations is so fraught with risks to health that it is hedged around by innumerable restrictions, yet it is seriously suggested that this most dangerous of metals is a safe substance to interpose between an infant and the breast. Exhortations to cleanliness and restricted use are futile, for there is no-one to see that these instructions are carried out.

I would draw the attention of your correspondents to the late Sir Thomas Legge's second axiom for control of industrial disease. He said: "If you can bring an influence to bear external to the workman (i.e., one over which he can exercise no control) you will be successful: if you cannot, or do not, you will never be wholly successful." For workman read nursing mother, and the rule holds good.

Usher Institute,
University of Edinburgh.

Catherine Swanston
Lecturer in Industrial Health.

Sir,—Whether or not lead shields can induce healing of a damaged nipple, it seems clear that their use must be given up. I have always thought that any good they did was more likely to be by keeping the injured surface from contact with clothing than from a deposit of lead salts. If so, a shield made of glass or some safe type of plastic material should do equally well and avoid risk to the child.

The very great majority of these injuries will heal quickly—in 24–48 hours rather than the week implied by Dr. Gordon last week—if, from the first experience of pain, suckling is withheld, the milk removed by hand, and the nipple surface protected. This has been the practice at this hospital for many years and has proved most satisfactory. The risk of mastitis is almost wholly saved and the woman spared suffering with its inhibitory action on the milk's outflow. When resumption of feeding reproduces the damage it is almost always because the nipple cannot be drawn by the baby far enough into its mouth. The likelihood of this should have been foreseen in pregnancy and a shield worn to improve its range of protraction.

May I support Mr. Nockolds and Dr. Moragas (Oct. 29) on the advantages of treating breast abscesses by aspiration—with one reservation? I doubt if a child should be allowed to feed at a breast which is acutely infected with *Staphylococcus aureus*. In pre-penicillin days I have known one infant die of enteritis from

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1. Heller, R. *Tubercle*, 1949 30 204.

ingesting this organism, and another who developed staphylococcal pneumonia and fatal pyopericarditis. The risk must be much lessened once a high concentration of penicillin is achieved; but only then, and only if it is maintained, can I agree that suckling should be allowed. Gentle removal of the milk by hand avoids the risk, and I believe results in better drainage.

British Hospital for Mothers and Babies, London, S.E.18.
HAROLD WALLER.

AEROSOLS BY INHALATION

SIR,—I was very surprised not to find in your leading article of Oct. 8 any reference to the 'Aerohaler' method of delivering micropulverised substances to the respiratory mucosa; especially as you say:

> "... *the need is for a simple apparatus with an accessible nebulising device which can be quickly cleaned.* ... *It should then be possible to abort the annual attack of recurrent bronchitis, to control the acute phases of bronchiectatic inflammation.* ..."

The manufacturers of the aerohaler claim that this means of delivery permits a more even and wider distribution of the material, together with a greater concentration per unit area. Its simplicity is unquestionable, and its effectiveness is also beyond doubt; for confirmation one has only to consult the report on 357 cases of various respiratory infections treated by Krasno, Karp, and Rhoads,[1] or to question other medical men who have used it. I have myself reported on a large lung abscess dramatically cured by this method.[2]

Galway.
D. T. O'DRISCOLL.

THE DOCTOR'S CREED

SIR,—I suppose that if the Archbishop of Canterbury enters the pages of a scientific journal [3] it will be his wish to do so on equal terms with others, and that, since he draws upon argument rather than authority to make his case, he will not mind some of his premises being called *into question.*

I speak as one who has given a good deal of thought to the ethical questions raised by being a doctor and a teacher, and indeed by life itself, and this seems to be an ideal opportunity to raise what to me, with some training in scientific reasoning, is a fundamental objection to the acceptance of the doctrine, though not the ethic, of orthodox Christianity.

It is quite impossible for me to believe that God is at the same time omniscient, omnipotent, and wholly benevolent. I have seen too many children die of leukæmia or nephritis to believe that "Man is the object of God's love, as God has shown in His acts"; and if, as Dr. Fisher asserts, God understands radar, then He surely knew of Buchenwald and Auschwitz. In short it seems that we must either believe that He is powerless to intervene against the evils of Satan and of man or that they are of His own creation. This, I am well aware, is no new objection; but just because it must be the stumbling-block of many thinking persons on the threshold of religion, so does it stand in need of an answer. Here let me anticipate the orthodox replies. To say that these are matters of Faith which we do not understand is to beg the question and renounce even the semblance of a logical approach to it. It is as if I were to say to my students "you must not question why you are to use this remedy or that; it must be enough that I who am learned in these matters say that you should do so." To say that because I have within me an instinctive knowledge of right and wrong it must have been given to me by God is to assert what I have not contested. And to say that Buchenwald had some divine purpose incomprehensible to man is to deny completely man's right to distinguish Good and Evil.

As if a little unsure that his beliefs will be acceptable, Dr. Fisher throws out the challenge man should accept them unless he has "a better thesis which will better equip him for his life and work." As there are today many earnest doctors, I hope beloved physicians, who do not subscribe to orthodox religious belief, I would try to state th as briefly as possible. They believe that as civilised educated men our conduct should be determined sense of personal responsibility; by the inner satis of doing right; because not to do so brings a personal failure; because those whom we most would act thus; and because of a respect for truth. think that a man can obey his conscience without of reward in this world or belief in the next.

To many in our profession the doctor's creed is strengthened by an attempt to believe what to incredible or to accept an explanation which does seem consistent with experience. We prefer to unacceptable hypothesis. To state this is disparage others in and out of our profession who comfort in religious faith.

I can only hope, Sir, that the sincerity of my lett to some extent pardon its obvious presumption.

Manchester.
ROBERT P

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[1] Krasno, L., Karp, M., Rhoads, P. S. *Ann. intern. Med.* 1948, 28, 607.

[2] O'Driscoll, D. T. *Lancet* (in the press).

[3] Fisher, G. *Ibid*, Oct. 29, p. 775.

Public Health

By-laws for Cleaner Food

THE Minister of Food has issued to local authoriti England and Wales a model for by-laws to secure observance of cleanly conditions in connexion with handling, wrapping, and delivery of food for hu consumption. These by-laws will supplement exist statutory measures. The model has been prepared consultation with local-authority and trade associati

Some desirable provisions have had to be exclu because of shortage of materials and equipment, a the model may be added to from time to time. T suggested provisions, which cover such matters personal hygiene, cleanliness and good order of equ ment, cleanliness of wrapping material, and the dep and removal of refuse, have been drafted with a vi to their application in both urban and rural areas, to every type of food-handling trade. In making laws local authorities are not bound to follow the pre terms of the model, which is intended as a guide provisions which are reasonable and enforceable ha regard to present-day conditions. The Minister h expressed the hope that all local authorities which ha not already done so will consider adopting by-la based on the model.

Births, Marriages, and Fertility in 1947

Part II of the Registrar-General's Statistical Revi for 1947 [1] reveals that in England and Wales the bir rate again rose, illegitimacy continued to decrease, a the stillbirth-rate was the lowest ever recorded in th country up to that time.

Births.—There was 881,026 live births which represent a birth-rate of 20·5 per 1000 total population; this was a increase of 1·3 per 1000 over the previous year and was th highest rate since 1921 when it was 22·4. This post-wa rise in the birth-rate was not maintained in 1948, when th rate fell to 17·9 (provisional). Of the live births, 196 were mothers under 16 years of age, and 16 to mothers aged or over (3 of whom were aged 55 or over). There were 46,0 illegitimate live births, compared with 53,919 the year befor —5·3 and 6·6% of all live births. Stillbirths numbered 21,79 representing a rate of 24 per 1000 total live and still birth compared with 22,915 and a rate of 27 in the previous yea This was the lowest rate recorded up to that time, but it now known that the 1948 rate was 23 (provisional).

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[1] The Registrar-General's Statistical Review of England and Wal for 1917. Tables. Part II. Civil. H.M. Stationery Offic Pp. 150. 3s.

iages.—In 1947 marriages numbered 401,210—the number since 1940 when it was 470,549. The marriage-er 1000 total population was 18·6, compared with id 18·7 in 1946 and 1945. In 1948 the rate was 18·1 00 (provisional). The most popular age for marrying for men and 21 for women; there were 78 males and males married at the age of 16 years.

lity.—46·9% of the legitimate maternities during the ere to mothers with no surviving previous children: to mothers with one surviving previous child; and to mothers with two. There were 11,221 maternities ng in multiple births, of which 5 were quadruplets and plets. Of about 113,000 confinements which took within 11$^{1}/_{2}$ months of marriage, some 59,000 occurred 8$^{1}/_{2}$ months, and of these about 38,000 occurred 6$^{1}/_{2}$ months.

rces.—The number of decrees nisi made absolute during as 60,190, compared with 30,298 during 1946 and a yearly e of 8288 for the ten years 1936–45.

Vaccination

Exeter, which was ninth on Conybeare's list of sh county boroughs with 28·3% of infants vaccinated. . B. Page, the medical officer of health, believes he number of children being presented for vaccina-s falling steadily. This is happening although the ing steps have been taken:

Almost all the general practitioners in the city have taken to do vaccination and send the completed cates to the health department.

One central weekly vaccination clinic and one fort-y suburban clinic are held in buildings familiar and nient to mothers because they are used for child-e purposes.

Midwives and maternity nurses carry out propaganda home, and there is a definite system of follow-up by visitors.

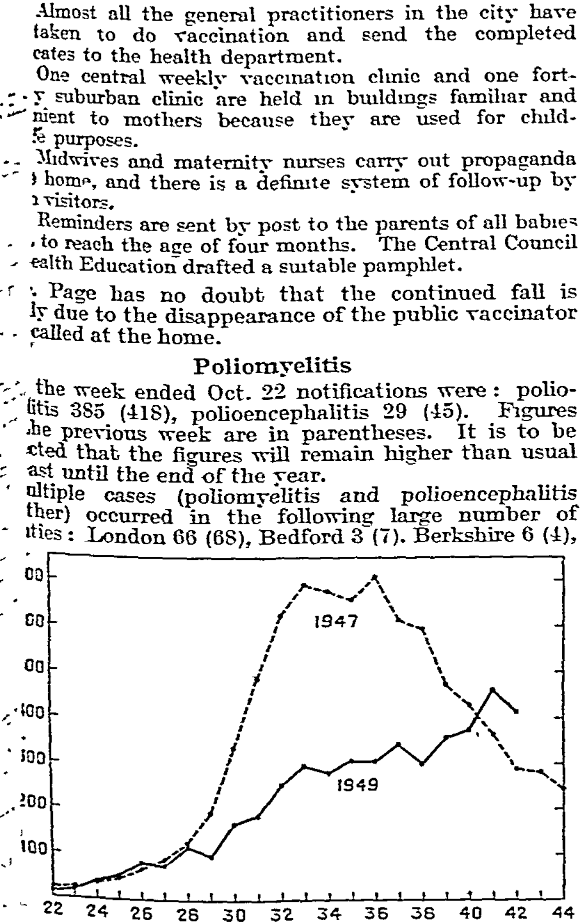
Reminders are sent by post to the parents of all babies to reach the age of four months. The Central Council ealth Education drafted a suitable pamphlet.

Page has no doubt that the continued fall is ly due to the disappearance of the public vaccinator called at the home.

Poliomyelitis

the week ended Oct. 22 notifications were: polio-litis 385 (418), polioencephalitis 29 (45). Figures he previous week are in parentheses. It is to be cted that the figures will remain higher than usual ast until the end of the year.

ultiple cases (poliomyelitis and polioencephalitis ther) occurred in the following large number of ities: London 66 (68), Bedford 3 (7), Berkshire 6 (4), ester 8 (7), Cornwall 4 (6), Cumberland 2 (7), Derby 5 , Dorset 3 (10), Durham 3 (4), Essex 32 (39), Gloucester (21), Hertford 6 (11), Kent 26 (33), Lancaster 25 (32), icester 13 (10), Lincs, Lindsey 7 (0), Middlesex 19 (18), rfolk 8 (8), Northampton 2 (4), Northumberland 9 (3), ttingham 9 (11), Somerset 10 (9), Southampton 13 (10), afford 12 (3), Surrey 16 (14), Sussex, East 2 (4), Sussex, est 2 (2), Warwick 9 (16), Westmorland 2 (0), Wiltshire (8), Worcester 2 (1), Yorks, East Riding 3 (3), Yorks, orth Riding 3 (3), Yorks, West Riding, 47 (48). amorgan 6 (4), Monmouth 4 (1).



Parliament

New Union of Hospital Officers

IN the House of Commons on Oct. 25 Sir JOHN MELLOR raised the question of the refusal of the Minister of Health to negotiate with the National Federation of Hospital Officers. This organisation, he said, was formed in January last year, and registered as a trade union in April. Its membership was confined to administrative, clerical, professional, and technical workers in hospitals and now numbered 3500 out of 6500 workers in this class. An application in July, 1948, for a seat on the functional council for administrative and clerical workers was rejected without any reason being given.

Dr. H. B. MORGAN said that the kernel of this problem was the right of a union, comparatively recently formed, to ask for representation on staff bodies already formed. The new union was of doubtful strength and doubtful permanency. The federation should wait its turn, prove its membership, and ask for representation on the appropriate occasion.

Mr. ARTHUR BLENKINSOP, parliamentary secretary to the Ministry, in reply, said it would be wrong for the Minister to interfere with the staff side of the Whitley Council. The federation represented 3000 out of 22,000 workers, and this number was not sufficient to warrant the Ministry interfering with the existing council.

Economy and the Social Services

In moving a resolution in the House of Commons on Oct. 26 approving the Government's plans to deal with the economic crisis, Sir STAFFORD CRIPPS, Chancellor of the Exchequer, said it now seemed clear that, owing to increased expenditure, the 1949 Budget would not produce as large a surplus as the Government considered necessary. They expected an increase in defence expenditure, that further expenditure would arise in connexion with the improved conditions of service in the health services, and that stocks of materials and foodstuffs would cost more owing to devaluation, or would be greater in quantity. There would be some reductions to offset these increases, and there would still be a large revenue surplus, but it would be considerably less than had been expected.

Giving details of the services to be curtailed, Sir Stafford Cripps said that the charge on the Exchequer for education would be reduced by about £5 million owing to a variety of measures which included an increase in the charge for school meals from 5*d.* to 6*d.* on meals costing 1*s.* 2*d.* and reduced transport facilities for pupils. The reduction of £35 million a year under the head of housing would mean during the course of next year a reduction in the current level of construction from about 200,000 houses a year to about 175,000. The Government considered that the programmes of the local authorities for building houses to let should have priority over the erection of houses by private persons under licence. The further measures required to bring the total saving to the figure the Government thought necessary were: the charge for prescriptions under the N.H.S., yielding £10 million economies; adjustments in the price of some less essential foods, increases in the prices of dried and frozen eggs and raisins, and the removal of the fish subsidy, yielding £7 million; and the elimination of the Exchequer subsidy on animal feeding stuffs, yielding £36 million.

Mr. ANTHONY EDEN, on behalf of the Opposition, said the proposals of the Government had no relation at all to the needs of the hour. Only if we could restore the national economy and confidence in ourselves within the next six months would the later economies have the chance to bear fruit. The Opposition had long urged that widespread economies could be made. The time had come for a thorough review of food subsidies, which in many cases were not subsidising food at all but other things. Not including milk in the schools, and other welfare foods, these subsidies were worth 3*s.* 2*d.* a week to each individual in the country, yet the average weekly expenditure on alcohol and tobacco was 11*s.* 6*d.* The principle of social services ought to be that the strong should help the weak, but we should not try to aid everybody alike indiscriminately.

QUESTION TIME

Births and Deaths Statistics

Mr. J. A. **Sparks** asked the Minister of Health what was the death-rate, birth-rate, and infant-mortality rate at the nearest convenient date and in 1933 and 1938; and by how much the expectation of life had increased compared with 1938.—Mr. A. **Bevan** replied: The figures are as follows:

	Death-rate per 1000 total population	*Birth-rate per 1000 total population*	*Infant-mortality rate per 1000 related live births*
1933	12·3	14·4	63
1938	11·6	15·1	53
1948*	10·8	17·9	34
1949			
March Qtr.*	15·0	17·4	40
June Qtr.*	11·1	17·7	30
Sept. Qtr.*	9·2	16·7	26

* Provisional

	Expectation of life of child at birth	
	Male	*Female*
1938	61·40	65·84
1945	62·56	68·58

Figures for later years are not available.

N.H.S. Prescriptions

Replying to a question Mr. **Bevan** *stated that the number of prescriptions dispensed in England and Wales during the quarter ended June 30, 1949, was about 46 million.*

Choice of Doctors and Patients

Sir **Ernest Graham-Little** asked the Minister of Health *if, in view of his undertaking that there should be free choice of patients by doctors and of doctors by patients, he would state why and under what regulation he assigned patients to doctors, and doctors to patients.*—Mr. **Bevan** *replied:* The power to assign patients to doctors is conferred by regulation 13 of the National Health Service (General Medical and Pharmaceutical Services) Regulations, 1948, made in pursuance of section 33 (2) (c) of the National Health Service Act, 1946. Persons are assigned only at their request.

X-ray Examination of Emigrants

Mr. **Gerald Williams** asked the Minister if intending emigrants requiring X ray were able to obtain this service under the National Health scheme.—Mr. **Bevan** replied: No.

Supply of Artificial Limbs

In answer to a question Mr. H. A. **Marquand** *stated that the average time taken for supply of an artificial leg under the National Health Service was at present 36 weeks. A considerable improvement in the supply position was expected as a result of the recent introduction of two new contractors and the steps which are being taken to increase the output by existing contractors.*

Vitamin-E Therapy

Mr. C. W. **Dumpleton** asked the Lord President of the Council what research was being carried out by the Medical Research Council into the claims made as to the effectiveness of alpha-tocopherol (vitamin E) therapy for heart-diseases.—Mr. **Herbert Morrison** replied: A trial of vitamin E in the treatment of angina pectoris has been carried out with financial support from the Medical Research Council. The results did not bear out the suggestion that vitamin E should be used in the routine treatment of this condition.

Late Claims for Maternity Benefit

Mr. F. J. **Erroll** asked the Minister of National Insurance *if he would extend the period after the birth of a child during which maternity grant and attendance allowance could be claimed.*—Mr. **James Griffiths** replied: *As a result of experience gained in the administration of these claims, the time-limits for claiming have been substantially extended. A month after the birth is now allowed for claiming attendance allowance, and 3 months for maternity grant, with an extension to 6 months in both cases where good cause for the delay is shown. The new time-limits have been given extensive publicity.*

Physique of School-children

Mr. J. A. **Sparks** asked the Minister of Education by how much the physical and nutritional standards of children of school age had improved by comparison with 1938.—Mr. **George Tomlinson** replied: Between 1938 and 1948 the average height of children in England and Wales increased by between $^1/_4$ and $^1/_2$ an inch, and the average weight by about 2 lb. In 1938 the nutrition of 14·5% of children inspected was classified as "excellent" and 74·2% was classified as "normal," the remainder being "slightly subnormal" or "bad." In 1948, under a different classification, the nutrition of 35·8% was classified as "good" and 59·6% "fair," the remainder being "poor."

Obituary

RICHARD ARTHUR NEEDHAM

KT., C.I.E., D.S.O., B.SC., M.D. MANC., F.R.C.S., F.R.C.

Colonel Sir Richard Needham, who died in on Oct. 24, at the age of 72, was known in India able administrator, and in this country as an ob and tactful inspector of overseas medical schools he visited on behalf of the General Medical Council.

Richard Arthur Needham graduated B.SC. in at Manchester, where he qualified as a doctor two later. Among the resident appointments held by was one as house-physician at Manchester Infirmary: and for a time he was a dem anatomy at Owens College. He entered the Ind Medical Service in 1903, and from 1905 to 1908 ser in North China. Four years later, in 1912, he seconded for special duty with the mission for rep tion of Chinese troops from Tibet. In the first war he served in France from 1914 to 1916, whe won the D.S.O. Thereafter he returned to India in 1918 became deputy director-general of med services—a post which he retained until 1924. In 192 he was engaged on special duty in organising the medical services of the Indian Railway Depa In 1923 he had gone to Paris as the delegate of the Office International d'Hygiène publique; undertook a similar mission in 1927. He retired the Indian Medical Service in 1930.

Between 1923 and 1930 Needham had acted as vi of the medical colleges in India approved by the Ge Medical Council; and between 1932 and 1939 he vi medical colleges in Rangoon, Ceylon, and Hong-K In 1939 and 1940 he undertook, on behalf of the Col Office, a similar review of the medical schools of Ni and Uganda. He served on the council of the Br Medical Association from 1932 to 1938. In the se world war he was commissioner of the Red Cross [illegible] Middle East and Italy; he [illegible] r of St. John of Jerusalem. [illegible] C.I.E. in 1919 and created a kn in 1932. He graduated M.D. in 1920, and bec F.R.C.P.E. in 1924 and F.R.C.S. in 1940.

C. H. B. writes: "To very many 'batches' of old I. men the passing of 'Dicky' Needham will almost symb the passing of the old I.M.S. as we who are left kne 'Dicky' to us meant the D.G.'s office, for when one went up to Simla or to Delhi, on purpose o leave, one called on the Director-General of the Se and was always sure of a welcome and an inter chat with the D.G.'s deputy, even if he turned d anything you might be asking for; and we all liked respected him and admired his efficiency during the war years when he held that post. D.G.s came went but Needham seemed a fixture and was the who knew all about you and was largely respon for your destiny in the Service. Despite this he had enemies and certainly many friends and they wil mourn his passing. In later years after he ceased deputy, one met him from time to time, generally at old East India U.S. Club, or at the I.M.S. dinner. the former occasions he usually seemed to have returned from some distant part of the world wher had been organising State medical services, or in national hygiene, or the Red Cross. He led, I thin jolly life. On these peregrinations he met many ac and interesting people and enjoyed it all. He wa great organiser and a robust and likeable persona whose cheery presence and sound talk we shall sadly mi

Another personal tribute comes from S. R. C. who sa "Though not in the Indian Bacteriological Serv Needham was always a welcome visitor to any of laboratories he had occasion to visit. Genial and frien he was always helpful and stimulating, and those of Service who had occasion to attend meetings or had ot business in Simla he went out of his way to make welc guests at his house, and by his friendly hospitality make their visit a pleasant experience. Needham ha flair for diplomatic work and was an active particip in many fields where this characteristic found full p He was keenly interested in all to do with the Ind l Service and was a great supporter of its interests. arried in 1925 Harriet Ellen, daughter of Lieut.- l R. Dewar, R.A.

CHARLES OLIVER HAWTHORNE

., LL.D. GLASG., D.SC. MANC., F.R.C.P., F.R.F.P.S.

C. O. Hawthorne, who died on Oct. 24 at the age had found time during his long life for several careers. He had practised medicine as a consultant gow and London; he stood high in the counsels British Medical Association; he was a pioneer tgraduate medical education; and he wrote and with erudition and fluency on questions of public .

884 he graduated M.B. with first-class honours at niversity of Glasgow, and three years later he ppointed assistant to the professor of the practice licine, a post which he held for the next ten years. as also clinical tutor at the Western Infirmary, w, later becoming assistant physician. In 1890 k the F.R.F.P.S. by examination and in 1899 he ded to the degree of M.D. which he obtained with ass honours. He was awarded the gold medal for sis. He also held a lectureship on materia medica erapeutics at Queen Margaret's College, Glasgow. e examined for the universities of Aberdeen, urgh, and Glasgow. To this period also belong his oks on *Galenical Preparations of the British acopœia* and *Forensic Medicine and Toxicology*.

London, where he settled in consultant practice, ckly won recognition and was appointed to the of the Hampstead and North-West London General tal, the Royal Waterloo Hospital, the Central n Ophthalmic Hospital, and the Central London tal for Diseases of the Nose, Throat, and Ear. 1909 to 1914 he was medical director and chairman e council of the Medical Graduates College and linic. In 1912 he published his *Studies in Clinical ine* and in 1928, in his *Short Essays on Medical s*, he gave a sane and balanced judgment on ems encountered in his long professional life. In he was elected F.R.C.P. His own university also wed on him the honorary degree of LL.D., and hester awarded him a D.SC. He especially valued honorary fellowship which he received from the l Academy of Medicine in Ireland.

member of the B.M.A. since 1888, he served on many s committees, though his interests were perhaps closely bound up with the work of the ethical, ce, and charities committees. From 1928 to 1931 resided, with outstanding ability, over the Repre- itive Body. “The thing that impressed one most his quite remarkable power of diction; his choice ords was almost perfect; and he was able to convey eaning in a way that impressed all who heard him. charm of his manner was great, and while he was an ive and indeed merciless opponent in argument, ever failed to encourage the lesser man; indeed ent out of his way to do so.” In 1932 he was elected e-president of the association, and in 1939 he was ded its gold medal.

r. Hawthorne gave much time and thought to medical ities, and was a valuable member of the Royal ical Benevolent Fund's management committee, which he often presided. As chairman of council he People's League of Health he worked stead- ly for the league, and he took an important part in its iry into maternal mortality and nutrition. In he was a member of a medical deputation to Ministry of Health to discuss safeguards for our -supply.

ARTHUR HILL BURNETT

M.R.C.S.

r. A. H. Burnett, who died on Oct. 7 at the age of 68, born in Southampton, and was educated at King ward VI School and the old Hartley College. He eived his medical training at Edinburgh University the London Hospital, qualifying in 1904. After ding house-appointments in London he visited many ts of the world as ship's surgeon. During the 1914–18 he served in the R.A.M.C., with the rank of tain.

In Southampton outside his busy practice he gave a large part of his time to the administration of anæsthetics: in 1919 he was appointed anæsthetist to the Royal South Hants and Southampton Hospital, and medical officer to St. Mary's Institute. At the Royal South Hants Hospital he was recognised as being an expert anæsthetist, and on retiring from this post during the late war he was appointed honorary consultant anæsthetist to the hospital. “He was an able physician and the pleasantest of colleagues. His contemporaries will long remember his ever-happy disposition, sincerity, and great friendliness.”

JOSEPH EDWIN BARNARD

F.R.S.

Mr. J. E. Barnard, formerly honorary director of the department of applied optics at the National Institute of Medical Research, was perhaps as close an example as this age affords of the distinguished scientist to whom science is a leisure pursuit. His father, the owner of a well-known hatter's business in the West End of London, gave his son only the education which he thought a suitable preparation for the family business. When the young Barnard left school he had shown two aptitudes —for music (he played the organ in the Methodist chapel which his parents attended), and for natural science. His father gave him a 3-guinea microscope when he was 16, and later looked on this as the only mistake he made in his son's education, since it led him to centre his interest on the useless hobby of microscopy instead of on the proper business of making and selling hats. Concluding that he could run only one hobby outside his work, the boy decided on microscopes rather than music; and at this stage he received encouragement from the Rev. W. H. Dallinger, F.R.S., a Methodist minister who had achieved distinction as an amateur scientist and was much in request as a lecturer—young Barnard assisting him with photography and lantern-projection. Before long he was working in several centres of medical and scientific research, including King's College, London, and he became known and appreciated by J. A. Murray, the late William Bulloch, and Leonard Hill. Eventually he was given accommodation, with a grant for assistance and expenses, at the National Institute for Medical Research when this opened at Hampstead in 1920, and his unit developed into a small department of optical and physical methods.

Barnard was then developing, with coöperation from the microscope industry (Messrs. Beck especially), an apparatus for photomicrography with ultraviolet radiation, using a system of quartz lenses. This was elaborated over a period of years, its ultimate form using a single wave-length in the shorter range of the ultraviolet. He was thus able to carry sharp resolution to objects of no more than half the size of those previously demonstrable by microscopy using visible rays. The extra range thus obtained seems curiously small now; but there can be no doubt that his work played a very important part in establishing the fact that the “elementary bodies” of a number of the true viruses could be rendered sharply visible by photography, without staining, and that their dimensions, as so measured, corresponded with those of the infective units of the same viruses as measured by selective ultrafiltration by W. J. Elford, working then as a member of his department. This work of Barnard's had also a pioneering quality, in revealing the possibilities open to photomicrography with invisible radiations, which have now led to the much higher resolutions obtainable with the electron microscope. Anybody who made close contact with him at that period would have had the impression that even such advanced developments were almost on the horizon of his scientific ambition, and were denied to him only by an education which had not given him the requisite background of knowledge in the fundamental sciences. With early advantages he might have gone even further as an inventor and discoverer. His energies, too, remained divided, for to the end of his activity in science he gave only half of each day to such research, and the other half to his business. Yet if he needed precedent he could have pointed to previous microscopists and fellows of the Royal Society, from the time of Leeuwenhoek, draper of Delft; and it is possible that his services to his science, and indirectly to medicine, might in fact have been no greater if he had exchanged his amateur status for that of the professional.

Mr. Barnard died at his home at Addiscombe on Oct. 25, at the age of 80.

JOSEPH EVERETT LA FRENAIS

L.R.C.P.E.

Dr. J. E. La Frenais, of Runcorn, Cheshire, died on Oct. 2, while on holiday in Scotland. He was educated at Dollar Academy, and studied medicine at Edinburgh, qualifying in 1930. He later held house-appointments at Hull Royal Infirmary and at Chester Royal Infirmary, where he became acquainted with the county in which he finally settled in 1935. During the late war he served in the R.A.F., reaching the rank of wing-commander. His service in the East left him with the disability which led to his death at the age of 44. On leaving the R.A.F. he resumed his practice, in partnership with his brother and later his brother-in-law. Although a bachelor himself, he was especially fond of his young patients, who instinctively responded to him; but his friendliness and kindness attracted patients of all ages. A Freemason and a Rotarian, he was also associated with the Runcorn squadron of the A.T.C., and at the time of his death he was the captain of Runcorn golf-club.

OTTO KAUDERS

From 1915 until his death on Aug. 6 at the age of 56, Dr. Otto Kauders held the chair of neuropsychiatry in the University of Vienna, made famous by his teacher and colleague Wagner-Jauregg. His productive life was hampered by political persecution and war. After serving as a medical officer in the Austrian army during the first world war, he was appointed to the neuropsychiatric clinic of the university of Vienna, where he later became Wagner-Jauregg's first assistant. In 1935 he was appointed to the professorship of neuropsychiatry at Graz. But with the spread of National Socialism in Austria he lost his appointment at Graz and took up consultant practice in Vienna. In 1939 he visited the United States; but he returned, with commendable courage, to see the second war through in his own country. In 1945 he was reinstated at Graz in July, and the following month he was appointed to the chair in Vienna.

In his earlier papers Kauders wrote on the psychiatric sequelæ of epidemic encephalitis, the internal secretion of the testis, and, with Wagner-Jauregg, on inoculation malaria. Later he essayed the malarial treatment of poliomyelitis and was hopeful of its usefulness. With Schilder in 1926 he published a textbook on hypnotism. Since the war he had done much to reorganise his own specialty in Austria. He started once more the *Wiener Zeitschrift für Nervenheilkunde*, of which he became editor-in-chief. His other writings include papers on the vegetative nervous system in relation to psychosomatic medicine, towards the study of which he was directing his department at the time of his death. He visited America for a third time in 1949, and in 1948 he led the Austrian delegation to the International Mental Health Congress in London.

R. W., an English colleague, adds: "Otto Kauders hid a firm character under the grace and charm of a cultured Austrian gentleman and patron of the arts. Not a Jew but a faithful Roman Catholic, he uncompromisingly endured a political persecution which he could easily have avoided, and acted, without melodrama, the part of a citizen prepared to resist wrongful government, alone if need be, and if need be to the death. I have a vivid impression of him in 1946, erect and still youthful, immaculately dressed, lunching off stale bread and water before his ward-round in the Allgemeine-Krankenhaus. His plea then was for a more sympathetic understanding from the 'Liberators' for the character of his younger colleagues and assistants, hard worked, half starved, and devoted. I can pay a tribute to the leadership he gave them then and to his own sterling character. For more than one visiting student of medicine he typified the most gentle yet most dignified of Austrian attitudes in the face of fourfold disaster. Withal his mind was wide open to the future."

Notes and News

CHLOROMYCETIN IN TYPHOID FEVER

In Sweden, Gabinus[1] has observed the effect of ' mycetin ' in seven cases of typhoid fever which admitted to hospital at Jönköping during the past a further two cases had perforce to serve as control the drug was scarce. All seven of the treated rendered afebrile after about 3 days, whereas the two remained febrile for 4 weeks. Chloromycetin was tered for only 3–10 days, and two of the relapsed with bacteræmia after the temperature had normal for 12–14 days. Gabinus quotes Bradley[2] that no definite opinion of the mode of action of in typhoid fever can be formed until the effect of during the first week of the disease has been This condition was fulfilled in three of the Swedish In one of these blood-culture, undertaken because member of the patient's family had already developed fever, was positive for 4 days before the patient any symptoms; but each of twelve cultures while chloromycetin was being given was negative. of these negative results were obtained with blood only a few hours after the start of treatment; and suggests that the rapid change from positive to was due to the presence of chloromycetin in the blood —in other words to the antibiotic action of the drug culture. He also suggests that the drug may effective preventive of the carrier state.

ROYAL DENTAL HOSPITAL

The 33rd annual clinical At Home of the school wa on Oct. 29. Any dental surgeon could have found lecture or a demonstration on his pet subject, was conservative treatment, denture work, or mino surgery. Obviously all departments had worked have interesting and out-of-the-way cases on view. morning session, which included two lectures and a demo tion of speech therapy, ended with the formal open the Stobie Memorial Library by Dame Lilian Lindsay

The highlight of the day's programme was a tele demonstration arranged by Marconi's Wireless Telegra Ltd. A 625-line closed-circuit system linked the ope theatre to the lecture hall. An 'Image Orthicon' cam the theatre transmitted by wire to four receivers in the only three of these—two with 9 in. tubes and one 15 in. tube—were seen by the audience, as the fourth used by the engineers for monitoring the transmission a permanent installation, these would be replaced projection-type tube which could throw a picture 5 ft. square. The morning demonstration was give Mr. Bowdler Henry, and a frenectomy was among operations televised. In the afternoon, Dr. A. showed how easy the removal of buried teeth can the hands of an expert; a lively commentary on the ope was given by Dr. H. M. Pickard, assisted by Dr. MacC himself. The television camera, with its four-lens made it possible to see each step of the operations as p as the operator himself saw it. The definition of the p was excellent—better, in fact, than with the average tograph film—although the contrast between different was not always as clear as could be wished. All the a small root apex, which gave some trouble before it finally removed, could be distinctly seen from the b the lecture-hall.

The last item in the At Home was a well-made and h teaching film in colour on the technique of Scaling Polishing.

LONDON HOSPITAL DINNER

Many medical dinners are dominated by their environ the restaurant and the toastmaster make the diners unnatural if not superfluous. But, whether by weig numbers or otherwise, the old students of the London Ho have always contrived to make their annual dinner a genu London Hospital occasion—homely and in character. year they reverted to the Trocadero, where they used to before the war, and some 340 of them enjoyed a long, cursive, easy speech by Sir Eardley Holland, the chair on the year's events and people in the hospital and me school. Having spoken with deep regret of the deat

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1. Gabinus, O. *Nord. Med.* Oct. 7, p. 1596.
2. Bradley, W. H. *Lancet*, 1948, i, 860.

ert Milne (last year's chairman) and Dr. J. H. Sequeira, ratulated Sir Henry Souttar and Sir Horace Evans knighthoods, and welcomed to the staff Dr. W. W. , Dr. R. A. Henson, and Dr. P. H. Tooley (assistant ns to the cardiac, neurological, and psychological- e departments), and Dr. R. S. Murray (assistant ist). Whatever else might be in doubt, he continued, know that we have at the London Hospital the finest medical school in Great Britain," and about 3000 ions had been received last year for about 100 places h admittedly a great many students put their name r every medical school in the country. The times of joint and the cost of a London Hospital bed was e £21 a week. We were to some extent at the mercy cal and social evolution and were now caught in those evolutionary spurts." But he did not think iticians or the proletariat, or both combined, could dicine: that disaster could come only from within. tor Lack, proposing The Chairman respectfully if id that the development of the London Hospital's y department was largely due to Sir Eardley Holland's and so was the success of the recent Congress of s and Gynæcology over which he presided.

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ity of Oxford

amination will be held at Worcester College, beginning 3, 1950, for the purpose of awarding a Nuffield medical ip of the value of £100 a year, tenable for four years. rms should be returned to the Provost of Worcester not later than Dec. 10.

ity of Cambridge

aymond Horton-Smith prize for 1948–49 has been to Dr. J. R. Squire.

ity of London

orrest Fulton has been appointed to the readership riology and immunology at the London School of and Tropical Medicine.

lton, who graduated as B.M. Oxfd, in 1939, is a member entific staff of the Medical Research Council in the depart- bacteriology and virus research at the National Institute al Research in Hampstead. During the war he worked M. Begg on the relationship of the murine and epidemic rickettsiæ, and their relationship with proteus OX 19. member of a team which investigated different laboratory of estimating the potency of typhus vaccines and he was or of the report to the Medical Research Council in 1946 *otherapeutic and other Studies of Typhus*. Previously he ed on diphtheria immunisation, staphylococcal toxins, and diarrhœa. Dr. Fulton took his D.M. in 1945.

itle of professor emeritus of physiology has been d on Dr. C. A. Lovatt Evans, F.R.S., on his retirement e Jodrell chair at University College which he had e 1926.

ollege of Physicians of London

comitia of the college held on Oct. 27, with Lord the president, in the chair, Dr. E. C. Dodds was Harveian librarian. Dr. Terence East, Dr. N. B. Sir Horace Evans, Dr. J. G. Scadding, and Dr. T. F. e elected councillors. The following representatives cted: Dr. C. M. Hinds Howell on the Committee of nent; Dr. F. S. Langmead on the Central Midwives the President, Sir Leonard Parsons, Dr. H. E. A. , Dr. W. G. Barnard, and Sir Allen Daley on the g Joint Committee of the three Royal Colleges; ds Howell, Dr. T. C. Hunt, Dr. J. C. Hawksley, and B. Harman on the Committee of Reference; and ds Howell and Dr. Harman on the Central Medical mmittee.

following were elected additional examiners for the ship examination:

inds Howell, Dr. C. E. Lakin, Dr. Anthony Feiling, Dr. Ward, Dr. Terence East, Dr. Hugh Gainsborough, Dr. Hunter, Dr. Macdonald Critchley, Dr. W. Russell Brain, rice Shaw, Dr. W. E. Lloyd, Dr. Kenneth Harris, Dr. Elkington, Dr. T C. Hunt, Dr. Clifford Hoyle, Dr. J. G. , Dr. McL. Rosenheim, Dr. Horace Joules, Dr. F. Avery

. C. Broom was appointed Milroy lecturer for 1951, ject being Leptospirosis. The Jenks scholarship was d to B. R. Wheeler, late of Epsom College.

ollowing were elected to the membership:

Aitchison, M.B. Glasg., L. S. Antonoff-Lewis, M.B. N.Z., aldry, M.B. Lond., T. B. Binns, L.R.C.P., M. I. Bostock, fd, D. P. Bowler, M.B. Lond., R. E. Britten Jones, M.D. , P. H. Buxton, M.B. Camb., Leonard Capper, M.B. Lond., Chambers, B.M. Oxfd, Diarmuid Collins, M.B. N.U.I., Geraldine E. L. Cummins, M.B. Camb., R. R. De Mowbray, B.M. Oxfd, captain R.A.M.C., M. F. J. Donnelly, M.D. N.U.I., Margaret D. D. Dudley-Brown, M.B. Lond., Joseph Dundas, M.D. N.U.I., Moustafa Yousef El-Gammal, M.B. Cairo. D. G. Evans, M.B. Wales and Lond., P. H. Friedlander, M.B. Camb., R. M. Fulton, M.B. Edin., W. F. M. Fulton, M.B. Glasg., J. M. Gardiner, M.D. Melb., Isaac Gordon, M.B. Witw'rand, K. G. Green, M.D. Lond., Raymond Greenwood, M.B. Manc., J. H. Gubbin, M.B. Lond., D. B. Gunasekara, M.B. Lond., K. J. Gurling, M.B. Lond., E. J. Halliday, M.B. Sydney, G. P. Hallwright, M.B. N.Z., W. S. Hamilton, B.M. Oxfd, R. M. Hardisty, M.B. Lond., H. W. Holland, M.B. Lond., J. G. Holmes, M.B. Camb., Mary C. Holt, M.B. Lond., J. A. Irwin, L.R.C.P., A. D. M. Jackson, M.B. Lond., G. A. Jackson, L.R.C.P., S. L. O. Jackson, M.B. Lond., R. N. Johnston, M.B. Aberd., H. E. M. Kay, M.B. Lond., R. J. Kernohan, M.D. *Belf.*, *J. D. S. Knight*, M.B. *Camb.*, D'Almero Kok, M.B. Lond., M. H. Lessoff, M.B. Camb., N. A. Lewtas, M.B. Manc., H. M. Lloyd, B.M. Oxfd, H. E. Magee, M.B. Belf., L. A. Magnus, M.B. Camb., R. H. Marten, B.M. Oxfd, F. B. Meade, M.B. Lond., J. B. Mitchell, M.D. Lond., J. K. Morgan, M.B. Lond., Brian Mullally, M.B. Belf., N. A. Neville, B.M. Oxfd, L. L. Nussbaum, M.B. Cape Town, J. S. Oldham, B.M. Oxfd, Dahyabhai Narshinhbhai, Patel, M.B. Bombay, R. A. Peebles Brown, M.B. Glasg. and Camb., E. R. Price, M.B. Wales and Lond., D. A. Pyke, M.B. Camb., John Rankin, M.D. Wisconsin, M.B. Glasg., R. M. E. Seal, M.B. Wales, P. H. Shorthouse, L.R.C.P., major R.A.M.C., R. G. Simpson, M.D. Aberd., A. L. Speirs, M.B. Aberd., P. G. Swann, M.D. Lond., W. P. Sweetnam, M.D. Manc., M. G. Thorne, M.B. Camb., N. A. Thorne, M.D. Lond., K. B. Thornton, M.D. Lond., W. F. Townsend-Coles, M.D. Lond., G. F. Vaughan, M.B. Lond., J. M. Walshe, M.B. Camb., P. L. Watts, M.B. Lond., John Wedgwood, M.B. Camb., T. C. P. Williams, L.R.C.P.

Licences to practise were conferred on the following 173 candidates (142 men and 31 women) who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board and have complied with the by-laws of the college:

A. G. Ackerley, J. D. B. Andrews, Doreen R. Austin, Gnaneshwar Rao Baji, J. P. E. Balbirnie, Barbara B. Ball, M. J. Ball, A. S. Basri, W. H. B. Begg, G. I. Benson, Peggy M. Birch, F. J. Birkett, B. L. Bisley, Klaus Böheimer, J. M. Bolton, R. K. Bowman, T. L. Bradbere, Anna A. Braga, M. T. D. Braide, H. H. Broadhead, H. S. Brown, D. W. Bull, George Canty, N. S. Capstick, Nancy I. Cardno, Paritosh Chaudhuri, P. H. Cima, Brigid M. R. Clark, C. R. Cowan, J. L. Cowan, H. A. Cowie, C. C. Cox, J. S. Cox, C. C. Crampton, R. A. Crook, D. I. Davies, D. J. Davies, Gower Davies, R. A. L. Davis, Ida J. Dawson, John De Choisy, Marie T. M. D'Netto, R. P. G. Dickerson, A. K. Doust, B. W. Durrant, Hans Duschinsky, Betty B. Dyer, Zusman Elkes, Diana M. Elkington, B. D. Ellis, T. La. Evans, T. Le. Evans, J. L. Facer, Dorothy Field, J. F. Filbee, R. H. P. Fitzpatrick, Alison M. M. Fleming, R. G. Forster, A. F. Franks, R. A. Garson, J. B. Gayes, H. R. E. Gillespie, J. E. Glover, J. D. Griffiths, J. J. Griffiths, G. E. Hanks, R. G. Hardwick, C. E. Hartley, S. K. Heywood, Basil Hirst, C. M. Hogg, T. C. Hopkins-Husson, P. T. Howse, R. T. Hughes, A. C. Hunt, P. J. Hynes, P. G. Jackson, Hilary M. K. Jenkins, W. P. Johnston, Neville Jones, O. L. Jones, J. H. G. Jowett, Lucy E. Kaye, George Kazantzis, Patricia M. Keefe, G. E. Kelly, Syed Mohamed Ali Khadri, B. G. Kiddle, Barbara Kilpatrick, E. T. Knudsen, S. A. Kotz, R. G. F. Lampart, Kenneth Lee, D. M. Lewis, P. E. Lewis, R. I. Lindfield, J. W. Lloyd, B. R. W. Lodge, D. H. Mackenzie, L. W. Mackey, I. E. J. McLauchlan, Lajosh Karol Manhajm, H. T. P. Martin, C. E. A. Mason, J. H. Mason, E. T. Mathews, D. C. Mayberry, Brian Measday, Mary S. Medcalf, Maureen Meikle, J. A. Menon, F. G. Montfort, D. F. Morley, Arnold Morris, Elizabeth S. B. Nicoll, N. A. Nobbs, Lola E. Owers, Doreen B. Pallot, D. D. G. Parsons, R. E. H. Partington, Dina Patuck, J. H. Paufflev, P. M. Pawsey, A. B. L. Peake, Dorothy J. Pearse, A. M. Platt, H. R. Playfair, D. F. Potter, G. L. Powell, J. M. Price, D. C. E. Rabbin, Rebe S. Rainsbury, Olga M. Rampersaud, Stella J. E. Randall, F. G. Reader, Michael Reckless, V. E. Rees, Joyce M. Richardson, J. J. Ridealgh, K. H. Ritchie, Nigel Rivers, J. S. Robertson, Yvonne K. Russell, Mark Sackwood, J. G. Sahakian, C. M. Samuel, J. T. Scott, J. D. Shapland, E. W. Shepherd, E. A. D. W. Simpson, W. K. Slack, G. H. Smerdon, Margaret W. H. Smith, A. W. Sonia, Gwendoline R. Stockley, W. H. J. Summerskill, A. S. Szurkawski, D. H. C. Thomas, Olwyn K. Thomas, O. L. Thomas, K. D. B. Thomson, N. A. Toes, Arthur Trueman, B. S. Turner, C. A. Unsworth, J. T. Wallace, D. E. Wallis, Glyn Walters, A. W. S. Webster, I. M. Wedgwood, B. L. Whitaker, Rodney Wilkins, S. W. Wilkins.

Diplomas were conferred on those named in the report of the Royal College of Surgeons (*Lancet*, Oct. 22, p. 773). The D.O.M.S. was also conferred on J. H. Owen-Flood and the D.T.M. & H. on T. H. Work.

National University of Ireland

The following awards have lately been made: travelling studentship in pathology to Dr. D. S. Breen; travelling studentship in anatomy to Dr. L. G. O'Connell; bursary in surgery to Dr. W. H. Radley.

Sherrington Society

A group of students of Liverpool University, who have taken an honours B.SC. course in physiology and who are now continuing their studies in clinical medicine and dentistry, have formed this society for the discussion of problems common to clinical medicine and the basic sciences. The first meeting was held on Oct. 19 when Sir Henry Cohen spoke on Pain. The next meeting will be held on Wednesday, Nov. 9, at 7.30 P.M., in the physiology lecture-theatre of the university when Prof. A. C. Frazer will describe Studies of Normal and Abnormal Fat Absorption in the Human Subject.

Pharmaceutical Society of Great Britain

At 17, Bloomsbury Square, London, W.C.1, on Thursday, Nov. 10, at 7.30 P.M., Mr. T. C. Denston, F.R.I.C., deputy secretary to the British Pharmacopœia Commission and formerly editor of the *British Pharmaceutical Codex*, will speak on the *British Pharmaceutical Codex 1949*.

Memorial to Dr. Slome

On Oct. 26, at the London School of Chiropody, Mr. A. M. A. Moore, F.R.C.S., president of Board of Registration of Medical Auxiliaries, unveiled a plaque in memory of Dr. I. S. Slome, director of studies at the school from 1936 to 1948.

Bequests by the Late Dr. Barclay

Dr. A. E. Barclay, whose estate amounted to £79,000, left £3000 to the British Institute of Radiology, and books and equipment to the Nuffield Institute for Research at Oxford. Subject to a life rent, shares in the residue of his estate are to go to the Strangeways Laboratory, Cambridge, the Royal Medical Benevolent Fund, and Papworth Village Settlement.

Eric Guttman Memorial Trust

A trust in memory of the late Eric Guttman was founded recently by his widow, Dr. Elizabeth Rosenberg. The purpose of the trust is:

To further the development of the Guttman-Maclay collection of pictures and books related to art and psychiatry;

To help the medical staff of the Bethlem Royal and Maudsley Hospitals (other than staff of consultant status) to attend scientific meetings and conferences; and

To furnish loans to young psychiatrists to further their training.

Further particulars may be had from the trustees, Maudsley Hospital, Denmark Hill, London, S.E.5.

Wessex Rahere Club

The second annual dinner of this club was held at Bath on Oct. 15, when Sir James Paterson Ross was the guest of honour and Mr. C. E. Kindersley was in the chair. Barts men living in Wessex who wish to join the club should write to the hon. secretary (Mr. A. Daunt Bateman, 3, Circus, Bath).

New Occupational Therapy School

The Derby School of Occupational Therapy—the seventh of its kind in the country and the first forming part of the National Health Service—was opened on Oct. 27 by Dr. Harold Balme, of the Ministry of Health's rehabilitation and resettlement department. The school, which gives a three-year course in conjunction with the Derby School of Arts and Crafts, will take at least sixty students.

Administration of Mental Hospitals

Hospital authorities have been advised by the Ministry of Health that the medical superintendent of a mental hospital or mental-deficiency institution, being the chief officer and responsible for general management, should see a copy of all relevant documents issued to the hospital management committee by the Ministry or by the Board of Control. It is also pointed out that the Minister laid down certain standards of accommodation in mental hospitals and mental-deficiency institutions, in order to secure special precautions and conditions essential for patients and staff. The authorised accommodation has been specified in the case of every institution; "and it is essential that no variation in the use of this accommodation should be effected without the knowledge and approval of the Department."

Prof. Alan Moncrieff is returning next Thursday from a ten-day tour of Portugal, where he is lecturing on behalf of the British Council.

Appointments

BENTLEY, J. P., M.B. Lond., F.R.C.S.: consultant general surgeon, Harrow Hospital.
BODENHAM, D. C., M.B. Brist., F.R.C.S.E.: asst. plastic surgeon, Frenchay Hospital, Bristol.
HUGHES, WILLIAM, M.D. N.U.I., M.R.C.P., D.T.M.: geriatrician, Bristol clinical area.
LYON, D. M., O.B.E., M.B. Edin., D.P.H.: deputy county M.O.H. and deputy school M.O., Kent.

Diary of the Week

NOV. 6 TO 12

Monday, 7th

UNIVERSITY OF LONDON
4.45 P.M. (*University College, Gower Street, W.C.1.*) Dr. Van Heyningen: Bacterial Toxins. (First of four

Tuesday, 8th

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Postgraduate Medical School of London, Ducane W.12.) Prof. K. J. Franklin: Kidney Function.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histopathology of the Skin.
CHELSEA CLINICAL SOCIETY
7.30 P.M. (South Kensington Hotel, 47, Queen's Gate S.W.7.) *Mr. W. B. Frampton: A Stipendiary*
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
5 P.M. (University New Buildings, Teviot Place.) Stammers: *Costoclavicular Syndrome.*

Wednesday, 9th

UNIVERSITY OF LONDON
5 P.M. (Westminster Medical School, Horseferry Roa Prof. H. L. Sheehan: Post-partum Necrosis of th Pituitary Gland.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28 Place, W.1
3.30 P.M. Dr. W. J. O'Donovan: Skin Ailments and Health.
ROYAL *FACULTY OF PHYSICIANS AND* SURGEONS, 242, S Street, Glasgow
5 P.M. Prof. Joseph Trueta: Relation of Hypertensio Circulation. (John Burns lecture.)

Thursday, 10th

ROYAL COLLEGE OF [illegible] Pall Mall East, S.W.1
5 P.M. Dr. J. G. [illegible] with special r Lung Cha [illegible] ure.)
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.
5 P.M. Mr. V. Zachary Cope: Visceral Actinomyco Treatment. (Bradshaw lecture.)
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. H. J. Wallace: Leukoplakia—Lichen Scler Anogenital Region.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Desmond Curran: Psychiatry lecture tion.
LIVERPOOL MEDICAL INSTITUTION
3 P.M. Sir Reginald Watson-Jones: Physiological R Bone and the Problem of Non-union of Fractur Owen Thomas lecture.)
HONYMAN GILLESPIE LECTURE
5 P.M. (*Edinburgh University New Buildings.*) Mr. G. son: Amputations, with special reference to th Limb Phenomena.
ADLERIAN SOCIETY OF GREAT BRITAIN
8 P.M. *Medical section.* (11, Chandos Steet, London, W.1.) Robb: Psychotherapy of Psychotics.

Friday, 11th

MAIDA VALE [illegible] NERVOUS DISEASES, W.9
5 P.M. Dr. [illegible] nical demonstration.
WEST KENT [illegible] SOCIETY
8.30 P.M. [illegible] .0.) Dr. R. S. Bruce Som [illegible] the Parotid Gland.

Saturday, 12th

BIOCHEMICAL SOCIETY
11 A.M. (London School of Hygiene, Keppel Street Symposium on the Biological Oxidation of Rings.

Births, Marriages, and Deaths

BIRTHS

GRANT.—On Oct. 22, in Birmingham, the wife of Mr. R. F.R.C.S.—a daughter.
HEWER.—On Oct. 21, in London the wife of Dr. A. J. H a daughter.
KINMONTH.—On Oct. 26, in London, the wife of Mr. John F.R.C.S.—a son.
LLOYD.—On Oct. 22. the wife of Dr. J. T. A. Lloyd—a da
MACRAE.—On Oct. 26, at Ilford, the wife of Dr. A. D. a daughter.

MARRIAGES

ANDERSON—HARVEY.—On Oct. 26, at Cadleigh, near J. Tardrew Anderson, M.B., to Anne Harvey, M.B.
COOPER—LEACH.—On Oct. 25, at Rochdale, Lancs, Willi Cooper to Joyce Leach, M.B.
GREEN—WHITE.—On Oct. 21, at Aber, David Mitch M.B., to Elizabeth White, M.B.

DEATHS

HAWTHORNE.—On Oct. 24, at Hove, Charles Oliver M.D. Glasg., D.SC. Manc., F.R.C.P., F.R.F.P.S.
NEEDHAM.—On Oct. 24, in London, Richard Arthur KT., C.I.E., D.S.O., M.D. Manc., F.R.C.S., F.R.C.P.E. brevet colonel I.M.S., retd, aged 71.
ROGERS.—On Oct. 28, in London, Norman Cumming M.B. Glasg.
WOODS.—On Oct. 23, at Douglas, *Isle of Man*, Lionel Woods, O.B.E., L.R.C.P.I., aged 63.

MATERNAL OBESITY*

J. H. SHELDON
M.D. Lond., F.R.C.P.
DIRECTOR OF MEDICINE,
THE ROYAL HOSPITAL, WOLVERHAMPTON

E purpose of this lecture is to call attention to the est of a common syndrome, which has been strangely cted by clinicians. It is a matter of common vation that women may at times develop a severe ty after having a baby, but the details of this ss have not been worked out and its only clinical iptions appear to lie in occasional requests from itioners for information on its treatment.[3-5] Nevertheless these details pose some remarkable problems.

e account which follows is based on the study of 40 en who had developed obesity in relation to the of one or more of their 109 children, while for rol purposes 40 women were studied who had no equent gain of weight after the birth of their 119 ren. I should emphasise at the outset that the ription is tentative only, and not definitive; for it ar that further studies on a larger series are necessary, that they should be undertaken while the gain of ht is actually in progress and therefore capable of t measurement.

TOTAL GAIN OF WEIGHT

f the 40 women, 38 knew their marriage weight; so total gain of weight could be estimated with some racy. The results are shown in table I.

would be fallacious to draw conclusions from the ibution of weight gain shown in this table, for the en represent a special sample referred to me by titioners of the district in response to a request for cases. Since only the obvious ones were sent—ved in the main from those who had actually consulted r doctor on account of obesity—it is impossible to whether they represent a separate entity or, as is e probable, they are merely the extreme examples process varying continuously from no gain up to maximum shown. The importance of the table lies s demonstration of the sheer size of the weight gain may be undergone by some women, for exactly the group had gained 75% or more on their marriage ht, and 4 cases had more than doubled this weight, maximum figure being a gain of no less than 125%. two severest cases were:

TABLE I

entage in of ight rriage ight = 100)	21–30	31–40	41–50	51–60	61–70	71–80	81–90	91–100	101–110	111–120	121–130
f cases	2	7	5	3	2	10	3	2	1	1	2

) A woman married with a weight of 8 st. 1 lb. She me extremely fat during her first pregnancy and weighed ly 14 st. at the end of the lying-in period. There a similar gain during the second pregnancy, followed slow rise to her present weight of 18 st. 7 lb.—or a gain 23%.

) A woman married with a weight of 9 st. She has two children, in each case with a rapid gain during nancy followed by a slow rise afterwards to her present ht of 20 st. 4 lb.—or a gain of 125%.

PROGRESS OF THE WEIGHT GAIN

wo or more phases could be distinguished in many of cases: (1) an initial phase, characterised by a rapid gain of weight; (2) a phase of equilibrium in which the weight remained perhaps indefinitely at its new high level; (3) an occasional phase of decline in which some or all of the superfluous weight was lost. The initial rapid phase appeared occasionally to be replaced by a slow steady gain continued for some years.

Initial Phase

This was characterised in typical cases by a very rapid gain of weight which began abruptly and either ended abruptly or gradually slowed in rate as the weight approached its final stationary level. Sufficient details were available from 16 women (19 confinements) to provide an indication of the actual rates of weight increase operative during this period. These are shown in table II.

The occasions on which these women had weighed themselves were entirely haphazard, but the table is nevertheless instructive. It will be seen at once that the longer the interval the smaller was the average rate of gain, for which there may be two explanations, based on different modes of increase. In the one there was an extremely rapid initial gain, as in case 25—when this woman's second baby was 11 days old she weighed 133 lb., and on the day it was 8 weeks old she weighed 170 lb., so she was gaining at no less than 5 lb. per week for a short period. In those patients who had weighed themselves within a year of the confinement the average rate of gain was 2 lb. per week, and in some of these there was a slow subsequent gain. Thus case 15 rose from 133 lb. at her confinement in January, 1940, to 168 lb. in April, 1940 (2 lb. per week), and over the next four years she rose to 218 lb. (0·25 lb. per week). The rate for the whole period would be 0·4 lb. per week, which is similar to those of cases 1, 5, and 3, who only knew their weights over intervals of about four years, and suggests that in them also there may have been a steep initial gain followed by a slow subsequent rise. The other mode of increase appeared to be a slow steady one: although 11 of the women represented in the table had been conscious of a rapid phase, 5 denied its existence and were emphatic that they had merely had a slow steady rise following the birth of the baby. It is clear that the rate of increase may be as remarkable as the final weight achieved. The case-histories suggested that this rapid gain of weight might begin in relation to two modes of variation:

(*a*) Either during pregnancy or immediately after the confinement.

(*b*) As a response either to one particular pregnancy or to all pregnancies.

These two variables were well mixed, but on the whole women who gained weight with each baby tended to notice the obesity during the pregnancy.

TABLE II

No. of case	Gain of weight (lb.)	Period	Weekly rate of gain (lb.)
1	84	4 years	0·4
5	61	4 ,,	0·3
3	56	3½ ,,	0·3
6	84	3 ,,	0·5
4	42	1 year	0·8
23	49	1 ,,	1·0
14	28	10 months	0·7
17 (2)	42	9 ,,	1·0
17 (1)	84	9 ,,	2·25
10	110	9 ,,	3·0
7	84	9 ,,	2·25
25 (1)	28	6 ,,	1·0
13	49	5 ,,	2·5
28	42	5 ,,	2·0
27	42	5 ,,	2·0
26	42	5 ,,	2·0
15	35	4 ,,	2·2
40	41	9 weeks	4·5
25 (2)	37	7 ,,	5·0

Figures in brackets give the number of the baby, when obesity occurred after each.

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ing a lecture delivered to the Postgraduate Medical School of London on Oct. 31.

ICAL DEP

(*a*) 21 of the 40 women stated that they first noticed the obesity during the pregnancy, but the changes so set in motion continue after delivery, for in 19 of these women the weight continued to rise afterwards. The onset was sufficiently sudden for them to be able to date it to a particular month of pregnancy, which in the majority of cases lay between four and a half and six months, though it might be as early as the second month, and one woman noticed it in the first month. 19 women, however, were *convinced that they did not begin to* develop obesity till after the confinement, and in such cases it may be that the gain of weight arose in relation to the establishment of lactation. Confirmation of this postpartum onset of obesity was obtainable in many cases from the clothes worn by the women, the story being frequently told that on getting up from bed they could not even wear the clothes they had worn immediately before the confinement.

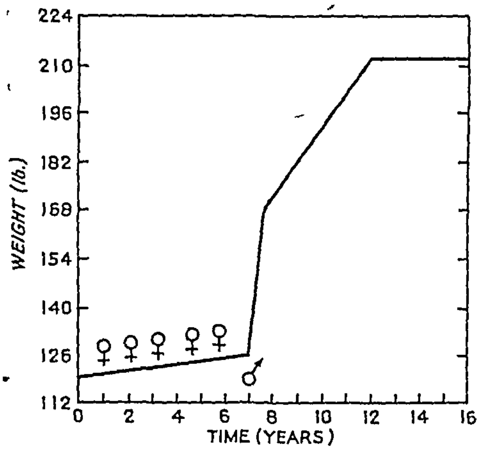


Fig. 1—Obesity after a particular pregnancy.

Thus one woman wore stock size "small women's" clothes during pregnancy, which she let out as required. This is confirmed by the fact that she weighed herself when eight months pregnant, and was 7 st. $8^1/_2$ lb. Two days later *she was confined with a premature baby weighing* $3^1/_2$ *lb.* When she came to get up she found that none of her clothes would fit her and her mother had to go out and buy some temporary second-hand clothes. She insisted on having her own clothes to attend the christening of the baby, which took place three *weeks after the confinement, and found* that the only ones she could get into were stock O.S.—or "outsize clothes." The baby was born eighteen years ago, and she has had to wear this size since.

A woman married at the age of 18 with a weight of 8 st. 2 lb. After her first baby there was no change in weight and she wore the same clothes as before the pregnancy. During the second pregnancy she only had to change her clothes at the end—the baby was small and weighed $5^1/_4$ lb. After the confinement she was in bed for three weeks, and when she got up she had become so fat that she could not even get into her maternity clothes, and had to have a new outfit. Thereafter she had to have a new set of clothes every month for nine months, by which time she had doubled her weight to 16 st. Her weight and clothes have remained stationary at this level for fourteen years. Several patients provided similar histories, which furnish strong evidence both of the postpartum onset and of the permanent nature of the weight gain.

(*b*) The other mode of *variation was in relation to* particular pregnancies. In one type, the obesity was the result of a single particular pregnancy, while in the second type each successive pregnancy caused a smaller gain of weight, which therefore rose in a series of steps. It was not always possible to distinguish the two types, for the second would not be apparent if there was only one pregnancy; and if the gain continued over some years, and there were further children during this period, it might be attributed *to them whereas it was really a* continuous process dating from the prior pregnancy. Nevertheless the distinction was apparent in some cases, and its reality is supported by extremely curious differences in the babies.

The weight curves of two women in whom the
was clear are shown in figs. 1 and 2.

Fig. 1 represents a woman who married with a weight 8 st. 7 lb. After giving birth to five girl babies in the six years, she began her sixth pregnancy with a wei 9 st. After the birth of her first boy baby she gained in the next four months ($2^1/_2$ lb. per week) and then gained a further 42 lb. over the next three years, to a weight of 15 st. 2 lb. Whereas the first five had only caused a total gain of 7 lb. the sixth to a gain of 6 st.

Fig. 2 represents a woman who married with an weight of 10 st. After her first baby—a premature weighing 3 lb. 3 oz. she gained weight rapidly and 13 st. in the next four or five months. She remained at this weight for ten years, when after a second rose to 14 st., and again remained stationary for three when after a third baby the weight rose slowly to 15 st. at which she has remained for seven years.

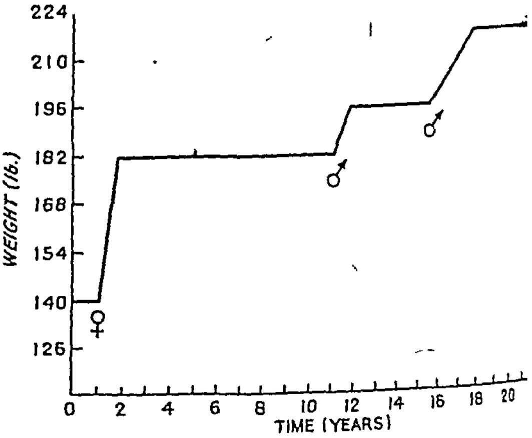


Fig. 2—Obesity after each pregnancy.

The second type almost invariably began with first baby and further gains occurred *with each* additio child. In 17 of the 18 cases placed in this group it after the first baby, and in the other it was the sec pregnancy. By contrast, the first type may not app *till a late pregnancy.* 13 of the 22 cases placed in group began after the first pregnancy, 6 after the seco 2 after the third, and 1 after the sixth. Almost invaria these later cases did not occur till a boy baby was bo the preceding babies having been girls. In fact, of 22 babies responsible for the onset of the condition this type, no less than 18 were boys and 4 were girls. the second type, where gain occurred with each pregnan the sex of the baby made no difference, there being boys and 37 girls in the 65 *children concerned.* In addit there were curious differences in the weights of the ba born to these various groups, which are dealt with la

Phase of Equilibrium

This is *a state of equipoise in* which the weight rema stationary at its new high level, and may last indefinite Occasionally a very slow rise might continue during t period—as in one case where the weight increased one stone over thirteen years, and in another by 10 lb four years. If the weight is reduced by diet or thyr treatment during this period, it tends to return to old level if the treatment is stopped.

Phase of Decline

In most cases the static phase appeared to per indefinitely, but occasionally the weight later decreas or even returned to its old level. Thus in *one case* wh the weight had been almost stationary for ten year rapidly fell after a further pregnancy, and in two ye the woman lost all the weight she had previously gain Subsequent loss of weight stood place in only 4 of t 40 cases—2 without discoverable cause, 1 *after* pregnanc and 1 after an emotional upset.

INSTABILITY OF WEIGHT CONTROL

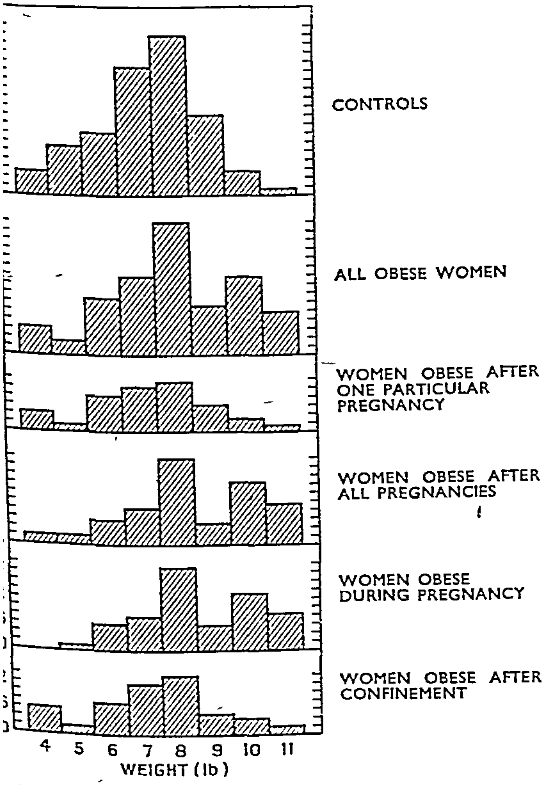
certainly curious that the same process of weight ay be initiated either during or immediately egnancy, and it is equally curious that the process rsist in operation for years after the immediate as ceased. The records of some of the cases that an instability of weight control is produced ys in the upward direction in the cases under ion—which may remain active for long periods.

a woman was 12 st. when her third baby was born At the end of the lying-in period none of her clothes it her and she had to borrow from a relative. She rapidly for a short time and then slowly increased, in March, 1949, she weighed nearly 15 st., when she herself again rapidly putting on weight. From 26 to May 28, 1949, she therefore weighed herself at ist's at weekly intervals—the successive increments lb. 6 oz., 3 lb. 13 oz., 2 lb. 10 oz., 2 lb., 7 lb. 10 oz., oz., 6 lb. 6 oz., 5 lb. 8 oz., 2 lb. 6 oz. She therefore 41 lb. 3 oz; in nine weeks, rising from 15 to 18 st., is volcanic increase occurred as a termination to a s slow gain, for after that her weight remained ry, 50% above its starting-point.

other case a woman married at the age of 27 with a of 10 st. She has one child aged 4 years 9 months. an to put on weight immediately after the birth and a slower rate so that in three and a half years she 14 st., but during the next fifteen months she increased stone. For the first period, therefore, she increased verage of 0·3 lb. per week, and during the second at per week.

CLINICAL CHARACTERS OF THE OBESITY

great majority of cases had a generalised obesity t special features. The deposits of fat tended to ulate especially on the proximal half of the arms, easts, abdomen, buttocks, and thighs, and in the dvanced cases this localised adiposity became very able. In the whole series of 40 cases there were only unusual features: 1 had other features suggestive of a Cushing's syndrome and 4 had an obesity virtually limited to the lower half of the body, with enormous deposits of fat around the pelvis and buttocks, huge thighs, and big legs, while the upper half of the body was relatively unaffected.



—Numbers of babies of various birth weights in various groups of women.

TABLE III

Group of women	No. of women	No. of babies: Birth weight (lb.) 4	5	6	7	8	9	10	11	Total babies
Obese	40	6	3	13	18	31	11	17	10	109
Controls	40	5	11	14	29	36	18	5	1	119
Type 1–(One particular pregnancy) ..	22	4	1	8	10	11	6	3	1	44
Type 2–(All pregnancies)	18	2	2	5	8	20	5	14	9	65
During pregnancy ..	21	0	1	6	8	19	6	13	8	61
After pregnancy ..	19	6	2	7	10	12	5	4	2	48
Type 1–During pregnancy	10	0	0	3	5	5	3	2	0	18
After pregnancy ..	12	4	1	5	5	7	3	2	1	28
Type 2–During pregnancy	11	0	1	3	3	14	3	11	8	43
After pregnancy ..	7	2	1	2	5	5	2	2	1	20

Associated Features

Disturbances of pregnancy seemed to be more common in the obese women, for 11 (10%) of the 109 pregnancies were abnormal (8 from hyperemesis and 3 from toxæmia) against 4 (3·3%) of the 119 control pregnancies (3 from hyperemesis and 1 from toxæmia).

Menstruation is unaffected, for the menses returned normally after parturition in every case, except the one that developed other features of a Cushing's syndrome.

Lactation is also normal, except that in some cases the obesity may be accompanied by an excess of lactation. The 40 women reared 102 children of whom 66 (65%) were fed normally at the breast and the 40 control women reared 117 children, of whom 79 (67·5%) were fed normally; so there is no difference in this respect. Of the 40 obese women, 11 (27·5%) insisted in addition on features indicating an unusually rich supply of milk: in 2 it appeared early in pregnancy, in 2 it continued for long periods after weaning, and in 7 the flow was so abundant that it was virtually continuous, amounting to a lactorrhœa. One woman actually found it difficult to feed her baby owing to the volume of milk produced, and in addition it poured out all day, soaking her clothes and bed, though the flow ceased normally on weaning. Of the control women, 4 (10%) gave a similar history; so, though more frequent, it is certainly not limited to the obese subjects.

Disturbances of carbohydrate metabolism occurred in some of these obese women in later life. Two were diabetic and under treatment for this condition. Glucose-tolerance curves were performed in 26 cases, of which 6 were abnormal and of diabetic type (fasting level above 120 mg. per 100 ml., and levels which rose above 200 mg. and remained above 120 mg. at two hours). These women appear to provide the reservoir from which those suffering from the "large-baby diabetic syndrome" of later life are recruited.

CHARACTERS OF THE BABIES

The total *fœtal mortality* was 11·4% in the obese women and 9·8% in the controls, made up as follows. The obese women had 8 miscarriages in 123 pregnancies (6·5%), and the controls 11 in 132 pregnancies (8·3%). The obese women had 6 deaths from stillbirth or neonatal death (4·8%) against only 2 deaths (1·5%) in the controls; so that the stillbirth and neonatal-death ratio was in excess of that of the controls.

The *birth weights* of the 109 babies born to the obese women and of the 119 babies born to the control women are shown in table III and the histogram in fig. 3 at once reveals that there were considerable differences. In brief the obese women produced a striking excess of large babies, weighing 10 lb. or over, and the excess may in fact be greater than appears, for the figures for large babies in the control group are higher than those obtained elsewhere.[1,17] It has already been stated that the case-histories suggested that there were two modes of variation in relation to the time of onset of the obesity, and the weights of the babies born to the women that on other grounds had been placed in either group are shown in table III and fig. 3. Several points of interest arise. (1) Nearly all the large babies were born to the women who gained weight with each successive pregnancy, and to those who developed their obesity during pregnancy. (2) It is therefore not surprising that the majority of the large babies were born to the women who combined both features—i.e., gained weight during pregnancy and with each pregnancy. In fact, eleven such women produced 8 of the 10 babies weighing 11 lb. or over found in the whole series of 109 babies. (3) All the small babies, weighing 4 lb. or less, were born to those who developed obesity after the confinement, and the majority of these babies were born to the women whose obesity arose in response to one particular pregnancy.

These statements are made with all reserve—the division between the various types was not always easy, and had to be based on the clinical history, and the numbers are not large; but the differences are so striking that they support the validity of the clinical differentiations, and suggest that more than one mechanism may underlie or accompany the obesity.

PERSONAL CHARACTERISTICS OF THE OBESE WOMEN

Initial Weight.—The weight on marriage and the height were known in 36 cases. 17 had weights at the time of marriage above that of the standard for their height[11] with an average excess of 10 lb., and 16 had weights below the standard with an average deficit of 12 lb., the standard and marriage weights being equal in the other 3. Only 20 of the control women knew their marriage weight (the reason for this discrepancy is not clear), of whom 6 were in excess of the standard with an average of 10 lb. and 14 were below with an average deficit of 12 lb. The evidence does not suggest that the women who subsequently became obese were overweight at the time of marriage, but rather that, whereas they were normal, the women who did not gain weight with pregnancy tended to be subnormal in weight at marriage.

Heredity.—The question of a possible hereditary basis for the condition was approached by an endeavour to discover whether the patient's mother had suffered from obesity and the extent to which the patient's sisters were affected.

Mother.—26 obese women were able to give adequate information concerning their mother, of whom 9 (34%) had developed obesity in relation to the birth of their children, while 17 had not. 37 of the control women were able to give information, of whom 7 (18%) had been affected and 30 had had no change in weight. The mothers therefore had suffered from maternal obesity nearly twice as frequently in the obese patients as among the controls.

Sisters.—The obese women had 37 sisters who had given birth to children, of whom 8 (21%) had developed obesity against 29 who had remained unchanged. The control group had 43 parous sisters, of whom 10 (23%) had developed obesity while 33 had not. There was therefore no difference in this respect between the two groups.

Birth Weights of the Subjects.—It has already been shown that the patients in this series produced an unusual number of large babies. If the condition has a hereditary basis one would expect a similar proportion of the subjects to have themselves been unusually large babies. This is the case. There are obvious inaccuracies in attempting to discover the birth weight of people born many years ago, but 20 women were able to quote the figure without hesitation and of these no less than 3 (15%) gave a birth weight of 11 lb. or over. In the control group 15 women were able to give their birth weights; the highest figure was 9 lb., of were 2. There therefore appears to be a difference. Women with maternal obesity a more apt to be born of mothers who have the same condition, but they are also apt have been big babies at birth.

Appetite.—It is clearly desirable to know habits of women suffering from the degree described here, but the subject is difficult to Not only is there the well-known reluctar obese women to disclose their total food inta may well be different in the two phases of and steady maintenance of weight. 9 of the were willing to coöperate were investiga method described by Widdowson and McC were provided with a spring balance † weighi and instructed to weigh in detail all the foo a period of one week, when the results we from food-tables.[16] There was nothing unu protein, fat, and carbohydrate composition and the average daily caloric intakes of the 1267, 1282, 1290, 1307, 1373, 1396, 1440, The two largest figures were from women phase of gain and the remainder were in th phase, and so far as they go the figures sugge intake is certainly greater in the active p intakes that supported a steady but large w small that their accuracy inevitably comes but it has to be said that they are in agreem almost invariable statement made by these they do not deserve to be fat on account o eat. The matter clearly needs further s controlled conditions.

DISCUSSION

It is well known that pregnant women g largely from fluid retention, but this is alm during the confinement and lying-in perio clearly a different process from the one cussion. At the other end of life, the " diabetic" syndrome has attracted much lately.[1,9,12,15,17-19] Briefly, women wh diabetes in later life tend to have given unusually high proportion of large babies previously, and it is also known that these often obese.[10] It is clear that this is one as condition under discussion, and that the featu described represent the beginning of a pro may, many years later, terminate in diabet The agreement covers the obesity, the large raised fœtal-loss rate, and the late deve diabetes mellitus; and the features associat onset of the condition are therefore of considera

It is inevitable that an explanation of this " diabetic syndrome" should be sought in a of anterior-pituitary function. Briefly, th runs thus. The work of F. G. Young[24,25] has the diabetogenic extract and the growth the anterior pituitary are closely related, an effect produced depends on the age of t puppies responding to an injection by growth dogs by the development of diabetes. An anterior-pituitary function could therefore a both the large size of the babies and the diabetes of the mother, and there is also e that it could produce the raised stillbirth-rat it could also cover the increased lactation some of the cases—if this prove to be an inte the syndrome.

Cogent—indeed compelling—though such a tion of these four features may be, there are t why it is difficult to extend it to cover the obe

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† I am indebted to Prof. R. A. McCance, F.R.S., for the balances.

the variable time onset of the obesity. It is easy
est that the same pituitary overfunction which
sed a woman to produce a very large baby has
to her increase in weight during pregnancy, but
d to see how the same explanation could apply
man who produces a very small baby and only
ight after the pregnancy is over. Secondly, it is
t that the features under discussion bear no
le relation to the obesity, which may develop
severest degree in the absence of any or all of
That they are not fundamental may be seen
e haphazard way in which they were distributed
he patients. They occurred in all on 43 occasions;
he 40 patients had obesity, but none showed a
tion of all four features and none a combination
; 14 had various combinations of two; 15 had
; 11 had none. The evidence therefore suggests
y are not so much essential parts of the syndrome
lental by-products of a deeper cause which of
evitably leads to obesity, but in any individual
may not produce these additional features.

here that the recent work on the production of
by experimental damage to the hypothalamus
important. It has been amply shown by numerous
[6 7 12-14 20] that a severe grade of obesity rapidly
appropriate damage to the hypothalamus; that
ppens whether the pituitary be left intact or
l; and that obesity does not occur after pituitary
in the presence of an intact hypothalamus. After
n there is an immediate gain in weight, so that
he first 24 hours rats may increase their weight
uch as 15%, followed by a rate of increase which,
still rapid, is not so great; an animal may gain
at ten times the rate of its unoperated litter
doubling its weight in three months or less; and
keys also the weight may be more than doubled,[8]
iod of rapid increase lasting for eight to ten
. This rapid gain of weight is associated with a
us appetite which may be apparent as soon as
mal recovers from the anæsthetic. The animal
ters a static phase in which the weight remains
t at its new high level for many months. It is
that the clinical details of the patients provide
parallel. There is the same sudden start to the
n, with a very rapid initial rate of gain followed
ely by a stage of permanent equilibrium in which
ght remains steady at its new high level. Further,
al gain is of the same order in the experimental
and the patients. As much as 74% of the total
weight of the animals may be due to fat, while
most severe case of obesity recorded here 55% of
ght would be due to fat, the patient having added
o her original weight. While, however, the experi-
obesity is clearly associated with a marked
e of appetite, its importance in the human being
yet determined.

utopsy records of the condition in the human
re available, and any discussion on its mechanism
efore speculative; but the following hypothesis
best to fit the facts in the light of our present
dge. The primary disturbance may well be in the
alamus, which, perhaps as the result of heredity
haps even more as a result of instability during
regnancy and lactation, is apt in these cases to
a disturbance of its normal control of weight. Such
rbance tends in most cases to be permanent; so
effect (to use an analogy) the controls get jammed
open position, and the body rapidly gains weight
t reaches the new level prescribed for it at which
s. In some of the cases the hypothalamic disturb-
produces also an increase in anterior-pituitary
on, which results in the appearance of large babies,
fœtal-loss rate, and an excess lactation, each in
one-third of the cases. The later development of diabetes mellitus may be due to this pituitary hyperfunction or may be merely the result of the prolonged obesity.

SUMMARY

An account is given of the circumstances under which 40 women developed obesity in relation to pregnancy. The maximum weight reached was 125% above that on marriage.

The increase might begin either during pregnancy or immediately after the confinement, and might occur after all pregnancies or only after one particular pregnancy—when the baby was often a boy. In typical cases there was an extremely rapid initial gain of weight, which was followed by a static phase when the weight remained stationary at its new high level for an indefinite period, though occasionally there was a later fall.

Abnormal pregnancy was somewhat more frequent than in the controls, menstruation was unaffected, and lactation was normal, though in some cases there was an excess of milk. In later life some of these women developed abnormalities of carbohydrate metabolism, and 2 were diabetic.

The stillbirth and neonatal mortality was raised, and the women produced an excess of large babies, which were, however, almost entirely born to those women who developed obesity in the course of each pregnancy. Small babies were, by contrast, confined to those women who became fat after confinement from a particular pregnancy. Their mothers had suffered from the same condition more frequently than normal, though their sisters were not specially affected, and they themselves showed a tendency to have been unusually large babies at birth. It is clear that these women provide the reservoir from which patients with the "large-baby diabetic syndrome" are recruited, though not all are so affected.

Though an explanation along the lines of an increased anterior-pituitary function could account for the large babies, the raised fœtal death-rate, excess lactation, and subsequent diabetes, it is not felt that the obesity can be so easily explained. It is therefore suggested that this may be due to a hypothalamic disturbance, which produces an obesity of similar nature to that which follows experimental injury to the hypothalamus, and in a proportion of cases also causes a disturbance of anterior pituitary function, which in the cases concerned, leads to the features of the "large-baby diabetic syndrome."

It is a pleasure to acknowledge my indebtedness to Prof. R. A. McCance, F.R.S., for much helpful and stimulating discussion on the matters raised in this lecture; and to Dr. S. C. Dyke, pathologist to The Royal Hospital, Wolverhampton, and Dr. A. G. Marshall, pathologist to the Guest Hospital, Dudley, for their help with the glucose-tolerance curves.

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THE HEALTH OF NURSES IN HOSPITAL *

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AN exact measure of the risk to health in nursing has still to be made in this country. Surveys by the American Hospital Association (1938) suggest that it is considerably greater than in college students and teachers—a reasonable expectation when adolescents and young adults are continuously exposed to disease. Until detailed studies of the health of women employed in different forms of nursing are made we must rely on the findings of particular hospitals. This survey of the nurses' health in an urban hospital, is added to those of Branson (1933), Wright (1944), and Cowen (1947) in the hope that the facts revealed will lead to the more effective care of nurses' health and greater efficiency in the nursing services.

THE HOSPITAL AND NURSING STAFF

The hospital is situated in the Thames Valley 17 miles from London. It was built in 1940 in the familiar hutted pattern of the Emergency Medical Service. The 650 beds were used for military and civilian casualties and increasingly by the surrounding urban population. At the end of 1941 a nurses' training school was established and from 1941 to 1944 it was an associate hospital of the Westminster Medical School.

The trained nurses, with a yearly income of from £220 to £500, were mainly unmarried and lived in lodgings at varying distances from the hospital. The students came from widely differing backgrounds. Of those entering in the period under review, 70% came from Britain, 20% from Eire, and 10% from Europe. 60% had had no more than elementary education. They were resident and received a salary rising from £53 in the first year to £80 on completing their training. The untrained or partly trained group was a mixed one. The "auxiliaries" were women with little or no previous hospital experience, who were non-resident and received £126 per annum with dinner and tea when on duty. The assistants, with a wider age range and often considerable hospital experience, were also non-resident and received £140–185 a year with meals when in hospital.

The age pattern of these four groups on entering the survey is shown in fig. 1. I was responsible for the supervision of their health from 1940 to 1946, and this study covers the three years 1943–45—a period of stability in staffing and the training life of a complete nursing school. The details of the examination type of records have been described in a previous (Court 1943).

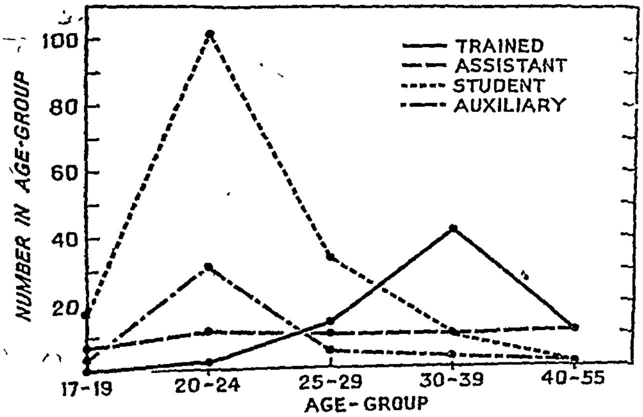

Fig. 1—The age-distribution of the four groups.

Health at the First Examination

A detailed initial history, though restricted by *limitation of the candidate's memory,* is always while. Some of the facts revealed—many of which be considered when selecting nurses—are given in

The dental state was regarded as "good" teeth were present and free from untreated caries, when not more than 4 teeth were missing and untreated caries was present in several, "poor" many teeth were missing, with caries in more 3, and possibly associated gingivitis. Normal vision taken as 6/6 or less on the Snellen scale. A third of refractive errors were uncorrected or inadequa treated when first seen.

TABLE I—PREVIOUS HEALTH AND PRESENT CONDITION AT EXAMINATION (% AFFECTED)

—	Trained	Student	Assistant	
Frequent colds	1	7	9	
Recurrent sore throat ..	6	0	4	
Tonsillectomy	22	32	30	
Rheumatic fever	..	1·7	4	
Severe dysmenorrhœa ..	..	2	2	
Defective vision	27	21	30	
Defective dentition ..	75	49	74	
Varicose veins	20	7	28	8
Hallux valgus	18	4	9	6
Acne vulgaris	2	10	2	14
Vaccination	68	35	28	19
Organic heart-disease ..	..	2	1	1
Innocent cardiac murmurs	6	16	9	18
Number of nurses examined	93	230	80	91

The figures for hallux valgus *do not* fully reveal unsatisfactory state of the feet in many nurses. C and callosities were the rule and the help of orthop surgeon and chiropodist was often required. Acne mild, except in 3 young nurses, but it has infecti possibilities in surgical wards and theatres, and sho not be dismissed as an adolescent inconvenience.

The incidence of organic heart-disease (1–2%) similar to that calculated by Morris and Titmuss for the whole population. The remaining murm were short, systolic in time, and weakened or unchan by exercise. As cardioscopy in these nurses was norm the murmurs were regarded, in Evans's sense of the te as innocent. The average blood-pressure was be 130 systolic and not more than 80 diastolic in all nur under fifty years of age. There were 5 nurses w systolic pressures persistently over 150 and diast pressures of 90 or more, but they were not distre- in any way and were capable of fulfilling their duties

Anæmia.—If we accept 80% or 12 grammes of hæm globin per 100 millilitres as a rough dividing line, were anæmic on entry, an incidence lower than in surveys (Whatley 1942, Wright 1942). No detailed of cell size and hæmoglobin concentration were but an effective response to iron occurred in 15 19 who received ferrous sulphate gr. 18 daily for months.

Relative Immunity to Diphtheria.—33% of the aged 17–19 years, 45% aged 20–29, 55% aged 30- and 70% aged 40–49, were Schick-negative. T positive reactors were immunised using three doses T.A.F. and there were sharp reactions in 10 nurses, 6% those being immunised.

Sickness

MEASUREMENT OF SICKNESS

Though sickness can be more accurately assessed nurses than in the general population, there are difficulties. The average number of days lost the

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* Derived from a thesis accepted for the degree of M.D. of the University of Birmingham.

TABLE II—EXTENT OF SICKNESS IN EACH YEAR

Sickness		1943				1944				1945			
		Trained	Student	Asst.	Aux.	Trained	Student	Asst.	Aux.	Trained	Student	Asst.	Aux.
ess		16 (36)	45 (40)	4 (9)	4 (13)	20 (41)	66 (42)	9 (20)	8 (20)	22 (45)	51 (33)	4 (17)	5 (20)
n 50 days	No. Days	27 348	55 954	41 705	22 308	26 399	73 1056	29 474	29 554	21 199	58 991	16 178	15 262
n 50 days	No. Days	1 55	11 1200	2 188	6 458	2 186	17 2029	6 576	3 292	5 430	12 1027	4 618	4 350
e omitting those ore than 50 days ..	Days per head	8	9·5	15·6	11·8	8·7	7·6	12·5	14·9	4·6	7·2	8·9	13·1

Figures in parentheses are percentages.

s is distorted by varying practices as regards
ve and by the loading effect of a few with
re illness. It is necessary therefore to decide
constitutes "excessive illness." In the main
an surveys this point is not mentioned. Wright
excluded illnesses lasting more than 100 days.
present survey 50 days in one year has been taken
ividing line and sickness above and below this
has been analysed separately. In the adminis-
of a hospital, however, long illness in a few is less
than shorter and recurrent illness in the many.
ed to know the proportion of staff ill at different
s and under varying conditions of duty, and the
s directly responsible for the major loss of working
If prevention is to anticipate treatment we should
arch for predisposing causes.

parison with women in other professions must
lecide whether nurses are more liable to diseases
so where the special dangers lie.

III—ANALYSIS OF A GROUP OF STUDENT NURSES PRESENT FOR THE WHOLE THREE-YEAR PERIOD

—	—	1943	1944	1945
o.	..	84	84	84
ays' sickness	..	1705	1993	1189
hout sickness	..	32	34	48
0 days' sickness in the year ..	No.	9	10	6
	Days	946	1357	587
s, omitting nurses with more 50 days' sickness	No.	75	74	78
	Days	759	636	602
	Days per head	10·1	8·5	7·7

EXTENT OF SICKNESS

hen presenting attack-rates (tables II–IV, fig. 2)
best to calculate the figure for all illnesses and also
one obtained when one-day illnesses are excluded.
is survey the latter were most frequent among the
ed and assistant nurses, and the common label of
ous" covered a variety of conditions which did
call for searching analysis. For comparison with
s this point should be clear, and I have assumed
Branson, Wright, and Cowen did include these
e days as individual attacks. To permit comparison
e amount of sickness in each year with the findings
e last two authors, only sickness exceeding 100 days
been excluded in table V, rather than the 50 days'
employed elsewhere in this survey.

e trained staff, with a yearly individual average of
ys' sickness, and 40% completely free from sickness,
the best record. The students' health, with 8 days'
ness, appears almost as satisfactory, but this view is
ified by the smaller numbers without any sickness
and the higher proportion with more than 50 days. Whether we consider complete freedom from sickness, excessive sickness, or the corrected sickness-rate, the assistants and auxiliaries have much more ill health than their trained and student colleagues.

TABLE IV—THE SICKNESS-RATE FOR THE WHOLE PERIOD IN THE FOUR NURSING GROUPS

—	Trained	Student	Assistant	Auxiliary
Attacks of illness	125	337	270	171
Attacks excluding one-day illnesses	94	314	140	128
Annual attack-rate	0·9	0·8	1·8	1·8
Annual attack-rate excluding one-day illnesses	0·7	0·8	1·2	1·3

TYPES OF SICKNESS

Respiratory Infection.—Table VI shows that the main component of nursing illness is infection of the respiratory tract. This, including the common cold, nasal sinusitis, tonsillitis, bronchitis, pneumonia, influenza, and acute undifferentiated respiratory disease, was easily first both in the number of working days lost and the proportion of the staff involved. Cowen, studying the same period, Branson (1933), and Rhoads and Afremow (1938) in Chicago found a very similar incidence. Wright's figures for this group of diseases (see table VII) are considerably lower, but it is not clear whether she included all respiratory infections, or whether some are hidden in her large "miscellaneous" group.

Infections of the Skin and Hands.—This group is next in importance, though there is a greater variation in different surveys. It consisted mainly of boils, whitlows, impetigo, and scabies. The incidence of skin sepsis is

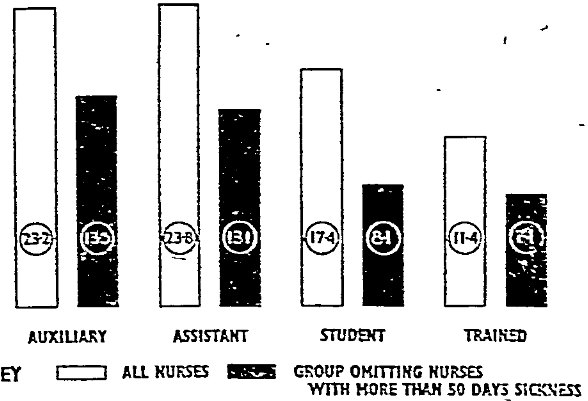

Fig. 2—The average individual sickness in days per year for the whole survey period.

TABLE V—EXTENT OF SICKNESS AMONG NURSES IN FOUR SURVEYS

Author	Type of nurse	Period	No.	All sickness: Annual attack-rate per nurse	All sickness: Annual sickness per nurse (days)	Sickness of less than 100 days: Annual attack-rate per nurse	Sickness of less than 100 days: Annual sickness per nurse (days)
Branson (1933)	Trained Student	1922–26 (5 years)	1273	1·2	..	..	..
	,,	1927–31 (5 years)	1365	1·0	..	..	..
Wright (1944)	Trained Student Auxiliaries	1936–38 (3 years)	1385	..	..	0·8	10·7
Cowen (1947)	Staff nurses Students	1943–46 (3 years)	763	0·8	11·2	0·8	10·6
Present survey	Trained Students	1943–45 (3 years)	558	0·9	14·4	0·8	10·6
	Assistants Auxiliaries	,,	212	1·8	23·5	1·8	18·4

much greater in Branson's and Wright's surveys than in the present one; in fact Wright points out that her investigation was stimulated by the frequency of whitlows in her own hospital.

Gastro-enteritis includes true dysentery and unclassified diarrhœa and vomiting; there were no large outbreaks, though this group of diseases is endemic among nurses in most large hospitals.

Injury occurred mainly when the nurses were off duty. Four of the accidents were severe and there was one death. The relatively high incidence was probably due to the necessity for many to live at some distance from the hospital and to cycle to and from their work in black-out conditions.

Tuberculosis will be considered separately. Although relatively few nurses were involved, the total loss of working time was very great.

Infectious fevers included infective hepatitis and zoster, as well as the exanthemata, and chiefly affected the younger nurses.

SEASONAL AND DEPARTMENTAL DISTRIBUTION

The highest incidence of sickness was in the first three months of each year, because of the dominating effects of respiratory infection. Though infective illness often appeared to start after periods of duty in the children's ward and in a small "isolation" unit, records were not equal to statistical analysis.

COMPARISON OF SICKNESS WITH OTHER GROUPS

No comparable surveys of women in other have been made in this country. The American given in table VIII suggest that the incidence in nurses is four times greater than in college and twice as great as in women teachers of all

Diehl (1935) compared the sickness-rates of nurses with other college students of the same a year, and found respiratory infections were and superficial pyogenic infections three times, as in the nurses.

Carmalt-Jones (1933) found an annual incidence tuberculosis of 3% in 169 nurses watched for 2 compared with 0·1% in 1125 women of the same in three other colleges not concerned with The surveys by Heimbeck (1936), Scheel (1937), Malmross and Hedvall (1938) in Scandinavia also that the morbidity from tuberculosis is four or times as high in medical students and nurses as in students. Though statistical proof requires surveys of professional women of the same age, it highly probable that there is a greater risk to health nursing than in other professions.

TUBERCULOSIS

The consideration of tuberculosis in relation to nursi requires a definition of tuberculous disease.

Scheel has suggested "a condition of clinical of tuberculous ætiology." While this recognises importance of manifest primary tuberculosis and thema nodosum, he does not include chance radiolog findings in individuals who have had no symptoms illness such as fever or cough. Since pulmonary les destined to give rise to serious disease may remain lat for long periods this definition is unsatisfactory. Prophit Committee in this country have formula more detailed standards (Daniels 1944). These give weight to both the clinical and radiological features the disease and have been used as far as possible in survey. At the same time Daniels, when asse tuberculosis morbidity in nurses, excluded "uncom cated primary focus or complex" and "eryth nodosum with no accompanying evidence of tubercu lesions." But what is an uncomplicated primary comp It is well known that unless radiography of the pri stage is frequent the X-ray signs may be missed. Furt

TABLE VI—CLINICAL DISTRIBUTION OF SICKNESS IN THIS SURVEY

Disease	1943		1944		1945		1943–45	
	Attacks	Working days lost	Attacks	Working days lost	Attacks	Working days lost	% all attacks	% tot days lo
Acute respiratory infections	144	1809	105	1436	67	901	40·4	30·4
Dysentery and gastro-enteritis	18	217	18	156	12	157	6·0	3·8
Skin disorders	17	181	15	174	13	168	5·7	[illegible]
Hand infections	12	170	6	71	8	155	3·3	2·3
Injury	16	261	9	430	6	172	3·9	5·6
Tuberculosis	6	740	12	1487	5	850	2·9	22·6
Infectious fevers	6	228	10	222	4	99	2·5	4·7
Rheumatism	6	56	7	178	3	51	2·0	2·0
Genital disease	6	104	3	116	5	228	1·7	3·7
"Debility"	4	46	10	160	4	114	2·3	2·3
Psychoneurosis	..	..	5	235	5	206	1·2	3·1
Urinary-tract disease	3	91	..	..	..	..	..	..
Immunisation reactions	9	29	1	5	..	..	..	..
Dental extractions	5	19	7	31	3	35	..	..
Tonsillectomy	1	25	4	109	11	341	..	..
Appendicectomy	..	..	4	165	1	38	..	..
Other operations	4	148	2	78	3	88	..	..
Peptic ulcer	..	..	..	..	1	55	..	..
Cholecystitis	..	..	..	..	1	164	..	..
Other disorders	48	157	52	254	55	143	..	..
Total	306	4281	270	5313	207	3965	..	

oux-conversion associated with symptoms, a raised -sedimentation rate, and possibly erythema nodosum, necessitating loss of working time, must surely, heel suggests, be accepted as representing tubercu- isease, whatever the X-ray findings. The subsequent opment of the bronchogenic phase is not conditioned e initial severity of the primary lesion. It seems able to combine these two concepts and with rds and Penman (1945) include "every case which ed any symptom or sign except elevation of the rocyte-sedimentation rate alone or a retrogressing ry complex among the cases of illness."

is has been done in the present survey and only of Mantoux-conversion without clinical or X-ray nce of disease have been excluded.

TUBERCULOUS INFECTION

e fact that more people are reaching adult life out infection by the tubercle bacillus is now recog- l. The first necessity in the continuous study of a p of nurses is to separate the infected from the fected. It is generally accepted that, with rare ptions, the change from a negative to a positive toux reaction shows that infection has taken place. rtunately agreement on a standard test technique yet to be reached. In this survey Old Tuberculin used and fresh solutions made every 14 days. The was taken when necessary to a strength of 1 milli- ime, with a minimum positive standard at 48 hours millimetres or more of œdema and induration, with ounding erythema. If the test reaction was in t or frankly negative the test was repeated with fied protein derivative (P.P.D., 0·00002 and 0·005 . The results in this and other surveys are n in table IX.

VII—COMPARISON OF THE PART PLAYED BY RESPIRATORY AND SKIN INFECTIONS IN DIFFERENT SURVEYS

ior	Type of nurse	Year	Respiratory Tract		Skin	
			Annual attacks of illness (%)	Days lost from sickness each year (%)	Annual attacks of illness (%)	Days lost from sickness each year (%)
son 3)	Trained	1922–26	37	..	23	..
	Student	1927–31	35	..	22	..
ght (4)	Trained Student Auxiliaries	1936–38	28	24	29	25
en 17)	Staff nurses Student	1943–46	42	35	15	11
ent ey	Trained Student Assistant Auxiliary	1943–45	40	30	9	7

he proportion of negative reactors is lowest in the ent survey, probably because many of the students between twenty and thirty years of age and a proportion of the whole group had worked in itals before. Among a group of 125 nurses with no ious hospital experience 21% were Mantoux- ative on first examination, a figure very similar to of the Prophit Survey (Daniels 1944).

hese figures suggest that in Britain now, one girl in y five reaches adult life without a primary infection h tuberculosis. These negative reactors are infected ospital, but at varying speeds, as shown in table X.

aniels suggested that these differences were related the type of hospital, rapid conversion, and a high ree of tuberculin sensitivity developing in those hospitals which admitted "all classes of patient including cases of advanced tuberculosis." The hospital under review belongs to this category yet the conversion-rate was slow. This may be explained by the fact that no negative reactors were allowed to work in the tuberculosis wards, and, recognising the danger of the unsuspected case, all patients with cough or sputum were promptly investigated and where necessary placed in the tuberculosis wards or the isolation unit. That intensity of exposure is not the only factor is shown by the presence in the hospital of a small number of negative reactors, one of them a sister, after three or more years of hospital life. Roberts (1945), working in a large sanatorium, also says that he met with slow conversion of this order in girls working for long period in tuberculosis wards.

TABLE VIII—COMPARISON OF SICKNESS IN NURSES AND OTHER PROFESSIONAL WOMEN

Group	Period	Nurses	Ages	Annual sickness per person in days	
Nurses—					
Trained (Britain)	1943–45	140	21–45	7·1	Excluding illness over 50 days
Student ,,	,,	418	17–30	8·1	
Auxiliaries ,,	,,	212	17–55	13·3	
Trained (U.S.A.)	1937–38	8794	21–35	6·6	
Student ,,	,,	17,364	18–25	8·3	
College students (non-medical) (U.S.A.)	1925–26	1258	17–20	1 8	
Teachers (U.S.A.) ..	1934–35	3270	20–60	3·5	

The clinical features of primary tuberculosis are well known. Of 23 nurses who experienced their first infection during the survey 15 had no symptoms of any kind. Of the remainder 5 had fever, 4 erythema nodosum, 4 pain in the chest, 3 cough, 3 loss in weight, and 1 joint pains. Convincing X-ray films were obtained from only 5 nurses.

TUBERCULOUS DISEASE

Tuberculosis was found in 6 (1·2%) of the 494 candidates at their first examination. The clinical features and subsequent progress are given in an appendix.†

TABLE IX—INITIAL TUBERCULIN REACTIONS IN DIFFERENT SURVEYS

Author	Year	Group	No. tested	Mantoux	
				Positive (%)	Negative (%)
American Student Health Association	1936–37	Students	32,281	30 5	69·5
Amberson and Riggins (U.S.A.)	1936	Nurses	539	57·9	42·3
Hedvall (Sweden)..	1937	Students inc. nurses	3336	81·5	18 5
Holm (Denmark)..	1928	Medical Students	1608	75·0	25 0
Prophit Survey (England) ..	1944	Nurses	3764	80·8	19 2
Present survey ..	1943	Nurses	303	87·2	12·8

Tuberculosis developed during the survey in 18 nurses, with a yearly incidence of 2·6%, 2·1%, and 2·4%. The main categories are shown in table XI, and the individual details in an appendix.†

Some comparison of the incidence and character of the disease in the positive and negative groups must be attempted, though deductions are dangerous without prolonged observation.

Table XII shows the position in the present study and table XIII results in other surveys. The higher incidence of disease in the tuberculin-negative group, accepted by most observers, is readily explained by late primary infection. Of the 7 "negative" cases in this survey, 3 required sanatorium treatment but no serious bronchogenic or hæmatogenous lesions developed within one to two years of the initial illness and there were no deaths. Of the 11 "positive" cases, 7 were latent or detected by regular radiography and 4 were clinically active;. 5 required sanatorium treatment varying from six to eighteen months. There were no deaths, though the disease recurred in 2 cases and in 5 was not considered quiescent until twelve to thirty months later.

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† Multigraphed copies of this appendix are obtainable on application to THE LANCET Office, 7, Adam Street, London, W.C.2.

TABLE X—MANTOUX-CONVERSION DURING TRAINING (ADAPTED FROM DANIELS 1044)

Country	Author	No. of negative reactors	% initially negative who became positive in		
			1 year	2 years	3 years
U.S.A. ..	Amberson and Riggins (1936)	70	..	..	86
	Israel et al. (1941)	277	86	95	..
New Zealand	North (1911)	104	35	..	..
		61	..	..	64
England ..	Present survey (1945)	11	36	..	..
		20	..	60	..
		8	..	..	87

The condition of the 24 cases at the end of the survey was as follows: 9 had recovered with normal radiographs, 11 were quiescent, and 4 were active; 12 were still nursing, 5 had resigned, 5 were under dispensary observation, and 2 had returned to sanatorium for further treatment. The working days lost by the whole group were over 3000.

Though the numbers involved and the corresponding effect on the staffing needs of the hospital are small, the importance of this disease to the individual nurse is very great indeed. Only half those affected were still nursing at the end of the survey. The final outcome for the others is unknown and a larger series still awaits careful analysis. Andrews (1943), commenting on this culpable ignorance, gave the details of 56 tuberculous nurses whose progress she had followed: 8 were dead, 18 were ill at home or in sanatoria, 12 had resigned from nursing, and 18 were still nursing.

TABLE XI—TYPE OF TUBERCULOUS DISEASE ARISING AFTER ENTRY TO THIS SURVEY

Class	Initial Mantoux reaction		Total
	Positive	Negative	
Clinically active pulmonary	1	..	1
Latent subclinical pulmonary (progressive)	3	..	3
Latent subclinical pulmonary (non-progressive	4	..	4
Pleural effusion only	1	1	2
Primary focus or complex	..	6	6
Extrapulmonary tuberculosis only ..	2	..	2
Total	11	7	18

The relatively mild disease and favourable prognosis for the negative reactor in the present survey is by no means the rule. Heimbeck in the eight years 1928–36 had 10 deaths from tuberculosis in the negative unvaccinated group and no death in the positive group. Daniels (1944), too, found that of the 33 cases following primary infection in hospital 9 developed extensive pulmonary or disseminated lesions and 2 died. Edwards and Penman (1945), like myself, found a less severe type of disease and no mortality. It is clear that the incidence and severity of tuberculosis among n varies considerably. Relating incidence to obserr years, the incidence at the Ullevaal Hospital in (153 per 1000) is eight times greater than the P figure of 19, and the present survey (78 per 1000) mid between. Though the Prophit mortality figure, all negative reactors (0·27 per 1000), is naturally lower the total female rate for England and Wales (0 7 ages 15–19, 1·06 at ages 20–24), this, together with Scandinavian experience, at least dispels the ten illusion that primary tuberculosis is a benign di with a happy ending.

TABLE XII—INCIDENCE OF TUBERCULOUS DISEASE IN CULIN-POSITIVE AND TUBERCULIN-NEGATIVE GROUPS D THE WHOLE PERIOD

Group	Total	Cases	%	Combined years of observation	Annual rate 1000 tion
Tuberculin-positive	264	11	4	607	
Tuberculin-negative	39	7	18	90	78

TABLE XIII—THE INCIDENCE OF TUBERCULOSIS ARISING ENTRY TO HOSPITAL IN OTHER REPORTED SURVEYS (AD FROM DANIELS 1944)

Country	Year	Observer	Initial tuberculin-positive			Initial tuberculin-negative	
			Total	Cases	%	Total	Cases
U.S.A.	1941	Pollak and Cohen	419	7	1·7	280	5
,,	1941	Brahdy	1320	6	0·5	910	34
,,	1941	Israel et al.	360	34	9·4	277	34
Norway	1936	Heimbeck	625	20	3·2	412	57
Denmark	1940	Heckscher	709	21	3·0	399	12
France	1942	Genévrier and Maclouf	238	4	1·7	42	3
New Zealand	1941	North	48	2	4·2	104	10
England	1937	Edwards	54	1	1·9	11	2
,,	1944	Prophit Survey	2120	43	2·0	452	27

COMPARISON WITH OTHER PROFESSIONAL GRO

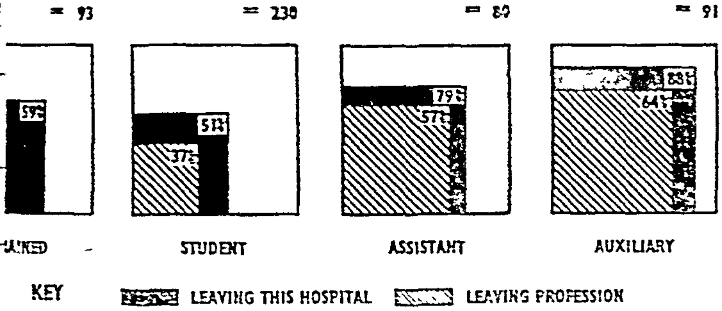
This comparison is attempted in table XIV. variation in nomenclature and standard of observ. make it difficult to reach a final judgment. T figures, however, combined with personal experien the problem, suggest that the risk of contracting tu culosis is significantly greater for nurses in *most* ge hospitals than for other professional women of the age.

Movement and Wastage of Nursing Staff

The therapeutic advances of the past twenty years, by making the care of the sick a more complica

TABLE XIV—TOTAL TUBERCULOUS MORBIDITY IN VARI SURVEYS 1936–45

Author	Observation period	Country	Group	Number	M II 1%
Stiehm ..	5 years	U.S.A.	Students	16,101	14
Scheel	3 ,,	Norway	Medical students	...	25
Malmros and Hedval	5 ,,	Sweden	Nursing and other students	3252	28
Pollak and Cohen	3 ,,	U.S.A.	Nurses	699	15
Genévrier ..	6 ,,	France	,,	280	25
Prophit Survey	8 ,,	England	,,	2572	26
Heckscher ..	3 ,,	Denmark	,,	1108	34
Badger and Ritvo	3 ,,	U.S.A.	,,	510	41
Present survey	3 ,,	England	,,	303	59
Heimbeck ..	11 ,,	Norway	,,	1037	7
North	4 ,,	New Zealand	,,	152	18



—The numbers of nurses leaving the hospital and the profession during the survey.

me-absorbing process, have created a relative ge of nurses. Though more women than ever before itering the profession, the estimated shortage ember, 1948, was 33,000. This figure is based on vacancies registered at the appointment offices Ministry of Labour and takes no account of the ion of hospital needs implied by the new health . That this service will call for more nurses is , but the real number required is not clear. The given above are based on the traditional use of e's time and skill—a tradition long immune from l investigation and retaining concepts of function scipline discarded in other professions. Further, ive no idea of how many women entering the ion leave before their training is completed and in ars immediately after qualification. A substantial e of student nurses has long been accepted as an ble element in their training. Even in the r Nightingale School at St. Thomas's Hospital 0% of the candidates completed their training of one year. More recently the serious loss of l staff quite soon after qualification has been ised (King Edward's Hospital Fund 1948).

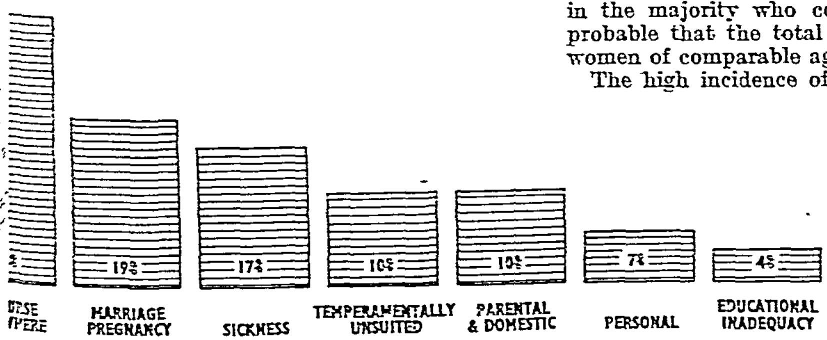


Fig. 4—The reasons for nurses leaving the survey hospital 1943-45.

view of the pressing importance of this problem to taffing of hospitals, it is pertinent to inquire what ickness plays in the problem of wastage.

degree and character of the changes in the nursing of this hospital from 1943 to 1945 are shown in 3 and 4 and tables XV and XVI. Though these s refer to the last three years of the second world vith understaffing, bombing, and domestic upheaval, n valid conclusions can be drawn. The loss of of students during training is very near the 40% l by THE LANCET Commission (1932) and the 43% ll municipal hospitals in 1937–43 (Working Party , which suggests that the factors responsible have nued in peace and war for the past fifteen years.

hen the particular reasons for leaving are examined, gnificant fact is the high place taken by illness— of all leavers and 25% of those who left the profession. this is no freak figure is confirmed by the findings of the Working Party (1947). Though the high figure for the complex of causes labelled resignation in their report limits the value of the remainder, illness was the greatest single cause of wastage.

In this survey the chief offender was emotional instability which accounted for 16 out of the 53 withdrawals because of ill health. The picture was at first sight one of long or recurrent physical illness, but more careful observation revealed the underlying hypochondriasis and psychoneurotic anxiety. The nurses were all cared for by a physician with considerable psychiatric experience. The prominent part played by mental illness is not surprising when we remember that numerous investigations in the past have shown the important part which it can play in the genesis of chronic ill health (Halliday 1935, Walker 1939, Pearson 1938).

TABLE XV—REASONS FOR LEAVING IN THE FOUR NURSING GROUPS

—	To nurse elsewhere	Ill health	Temperamentally unsuited	Educational inadequacy	Marriage or pregnancy	Parental or other domestic claims	Personal
Trained	53·5	3·5	..	..	27·8	11·4	3·8
Student	30 8	15·5	15·5	11·3	14·6	5·8	6·5
Asst.	27·0	20·7	9·5	..	20·6	15·8	6·4
Aux.	27·6	20·0	12·5	..	11·2	13·8	12·0

Figures show percentage of total leaving the hospital 1943-45.

Psychoneurosis however was a minor cause of sickness in the majority who continued nursing, and it seems probable that the total incidence is no higher than in women of comparable age in other professions.

The high incidence of respiratory disease among the leavers (13 of the 53, excluding tuberculosis) is in keeping with its position as the chief cause of sickness among nurses.

Study of the individual illnesses likewise suggests the need for a very careful inquiry into previous respiratory, cardiovascular, and psychoneurotic illnesses at the first interview. It is interesting that none of the 16 cases of psychoneurosis had given any previous personal or family history at their first interview.

Comment

This is essentially a record of sickness—a record of a small group of nurses working in an ill-designed hospital

TABLE XVI—REASONS FOR LEAVING AT DIFFERENT PERIODS (%)

Period of service	To nurse elsewhere	Ill health	Temperamentally unsuited	Educational inadequacy	Marriage or pregnancy	Parental or other domestic claims	Personal
3 mos.	8·3	14·6	41·7	8·3	10·5	8 3	8·3
3–12 mos.	29·7	21·4	8·6	7·5	13·6	11·7	7·5
1–2 yr.	28·6	20·0	2·8	1·4	24·3	14·3	8·6
2 yr. +	49 3	11·5	1·9	1·9	23 0	5·7	6·7

in time of war. Though we know something of their past health, present physique, and relative susceptibility to infection, no assessment of early environment, intelligence, emotional stability, or personal discipline was made. Nor was any study made of such relevant factors as the length of working hours, the pattern of training, or the quality of hospital life in accommodation, feeding and recreation, professional prospects, and, above all, the status and significance of the nurse in the hospital world. Nevertheless, pending wider and more representative investigations, some conclusions can be drawn from the extent and character of the sickness observed, which closely resembles what was found in previous studies. It is highly probable that the health of hospital nurses—notably student, assistant, and auxiliary nurses—is less satisfactory than the health of women in other professions, and this additional illness is mainly due to *Respiratory Infection, Skin Sepsis, Infective Diarrhœa, Infectious Fevers,* and *Tuberculosis.* Further, the proportion of nurses leaving the profession during the early years of training is very high, and illness is a major factor in this persistent wastage. The main problem in preventive medicine today, in hospitals as in the general community, is the control of acute respiratory infection. Yet we know little of the responsible infective agents. The experience of Rhoads and Afremow (1938) that streptococcal sore throat was the greatest single cause of illness among nurses at Cook County Hospital, and created a serious carrier problem in nurses and patients, is shared intermittently by all concerned with the care of people in institutions. Recognition of the importance of the nasal carrier and excretor of hæmolytic streptococci, so clearly proven by Hamburger et al. (1944a), and of dust pollution and dust-borne infection, has brought greater precision into the epidemiology of ward infections with this organism. But the hæmolytic streptococcus is not the whole story. The meticulous studies of army recruits by the Commission on Acute Respiratory Diseases (1947) at Fort Bragg show that non-streptococcal tonsillitis is often twice as common as the streptococcal variety, and that three-quarters of the respiratory infection was most aptly called acute undifferentiated respiratory disease.

After respiratory infections, boils, styes, infected blisters, and whitlows cause the largest number of illnesses and, in the experience of Wright (1944), the greatest loss of time. Staphylococci are the main organisms involved, though in certain outbreaks (Spooner 1941) streptococci may be involved. Though staphylococci are often found in the nurse's nasopharynx, a high skin carrier rate is particularly associated with active or recent staphylococcal lesions.

The control of the common fevers and the problem of endemic infective diarrhœa will not be considered in detail. Active immunisation is effective only against diphtheria and to a lesser extent pertussis, though in the latter case immunity is partial and of short duration.

PREVENTION OF TUBERCULOSIS AND OTHER INFECTIONS

Tuberculosis, though affecting a minority of the staff, was second only to respiratory infection in total loss of working time. Further, the outlook for the individual nurse and the fear which the community has of this disease give it particular significance in the care and recruitment of nurses. While exaggerated respect continues to be paid to diseases such as scarlet fever, it is astonishing to find how ignorant people are, even within hospitals, of the high infectivity of tuberculosis. Geer (1934), by facing this single fact and introducing an extremely detailed anti-infective ritual, reduced the tuberculosis morbidity among his sanatorium nurses from 5·5% during 1928–30 to 1·6% for 1931–34. The logical inference from earlier data in this paper would be that negative reactors excluded from sanatoria, chest hospitals, and the of general hospitals likely to admit unsuspected of open tuberculosis.

In spite of much fundamental ignorance rel the spread of infection, the worth of certain m is well established.

Method of Admitting Patients.—This is the real ning of success or failure. The preliminary all patients must be made by an experienced assisted by seasoned nurses, and cannot be to newly qualified and inexperienced substitutes. doctor must have the time to inquire into past illnesses and recent contact with infection. Patients obvious upper-respiratory infections, otorrhœa, or other pyogenic dermatitis should not be admitted general wards, but to effective isolation rooms. tonsillitis, whether or not it is accompanied by a and so elevated to the rank of scarlet fever, is be to an isolation hospital or unit.

Attitude of the Nursing Staff.—Once the patient the ward the instructed intelligence of the nursing is the most important factor in controlling With the present shortage of nurses an elaborate of masks and gowns often becomes a façade be which the safer and more important measures neglected. The nurse requires much more imaginative teaching about the nature of infection its danger to herself and her patients than she rece in many hospitals. She should be encouraged to rep early infections in herself without fear of censure. T comment of Bevington (1943) on this point is signific

> “The belief was general in all the hospitals I visited th nurse could not go off duty simply on account of a however heavy it might be. In the course of this inq I interviewed nurses on duty suffering from such heavy c as would have entailed their being sent home from modern office if only to safeguard the rest of the staff.”

Ward Techniques.—The control of ward infe depends not only on the quality but also on the of nurses. Understaffing means hurried nursing and natural omission of preventive measures. Preo with the design of wards and the mechanical of dust have tended to displace the simpler t which can still be carried out in old and uns buildings. Careful washing of the hands between is still the most important single measure, and basins should be so placed in wards that this Dry sweeping of floors should be forbidden and by sweeping with damp sawdust or vacuum A thermometer should be provided for each p and kept in 1 in 60 carbolic or some other disinfectant.

Devenish and Miles (1939) found that ‘Celloph in suitable thickness was impermeable to staphyloc and recommended a mask consisting of a $6^{3}/_{4} \times 8^{1}/$ sheet of cellophane (no. 600) sewn into a 7 × pocket made in the middle of the upper border of a of double folded muslin 36 × 15 in. and sterilised in Masks should be reserved for special cases; they sho be worn both by the nurse and the patient; and th should not be worn for more than two hours at a On removal they should be placed immediately disinfectant and not left lying about for subsequent us

Bed linen forms an immense reservoir of bact which are generously dispersed when beds are ma This dispersion can be much reduced by the use o little technical white oil in the final stages of laundri

Finally the proper care and cleansing of crockery ne more thought than it generally receives. The infe patient is given special crockery which is boiled a use, but the general sharing of other crockery, wh cracks are known to be a secure nidus for bacteria

XVII—MEDICAL SUPERVISION OF NURSES IN NINE LARGE GENERAL HOSPITALS IN GREAT BRITAIN (1945) (COLLECTED BY THE AUTHOR)

al	First examination by	Re-examination (routine)	Sick nurses treated by	Choice of medical staff	Routine radiography of chest	Repeat radiography	Tuberculin testing	Schick testing	Immunisation	Hæmoglobin estimate	Weight recording	Care of feet
	Med. registrar	None	R.M.O. or hon. physician	Yes	Yes	At 6 mos. then annually	Yes	Yes	..	Yes	..	..
	First assistant	After first 3 mos. not again	Hon. physician	No	Yes	Second year	Yes	Yes	Diphtheria Enteric	No	..	..
	R.M.O.	Every 6 mos.	Hon. physician	Yes	Yes	Every 3 mos.	Yes	..	..	Yes	Every month	..
	R.M.O.	After prelim. training. Not again	R.M.O. and hon. physician	Yes	Yes	Annually	No	Yes	Diphtheria	No	Annually	Routine by orthopædic surgeon
	Assistant physician for nurses	None	Assistant physician for nurses	No	No	No	No	No	Diphtheria	No	Monthly	..
	Senior res. physician	After first 3 mos. on wards only	Senior res. physician	No	Yes	Annually	Yes	No	..	Only staff in X-ray dept.	..	..
	Med. registrar	None	R.M.O. and sen. res. physician	No	No	No	No	No	Diphtheria Enteric	No	..	..
	Hon. physician	End of second year	Hon. physician	No	Yes	Annually	Yes	Yes	..	Nurses in X ray every month	..	..
	Report from private doctor	After 4 mos. probation. Not again	R.M.O. and sen. physician	No	Yes	No	..	..	Diphtheria Enteric	..	..	..

accepted. Attention to these details is within capacity of most hospitals, and can diminish infection both in staff and patients.

SUPERVISION OF NURSES' HEALTH

e *initial examination* should be carried out by an ienced physician, responsible for the continuing vision of the nurses' health and for the keeping of ds. Table XVII shows the differing pattern of care e large voluntary and municipal hospitals in different of Great Britain in 1945. When reviewing the health, special attention must be paid to family or nal mental illnesses, recurrent respiratory infection, tuberculosis.

e examination should include a postero-anterior of the chest, complete Mantoux and Schick testing, globin estimation, and careful examination of the teeth, nose and throat, feet, and urine. In view e unsatisfactory state of the feet in many nurses, often necessary for them to be seen early by an pædic surgeon and in some cases by a chiropodist. tment, combined with careful advice on shoes and ise, would go far to reduce the foot strain experienced any, especially during the first nursing year. Dental sment would be helped by the establishment of pted categories of dental adequacy by the British al Association. Where available, cardioscopy should rried out in all cases with any cardiac abnormality though the murmur is considered innocent.

rther Routine Examinations.—A second examination a three months' probationary period is desirable re final acceptance. The extent of this would rally be determined by the results of the first inter- . Apart from checking any physical defects it ld be possible in the light of ward and training-ol reports to reach a more reliable judgment of entrant's character and temperament. After this, ual re-examination probably suffices, with the ition of special scrutiny after periods on night duty, uberculosis wards, and on returning from sick-leave. hest films and hæmoglobin estimations should also taken annually, though the first should be repeated within three months of being on the tuberculosis wards and the second after a substantial period of night duty. Tuberculin-negative nurses should be retested every three months, and further chest films should be taken on conversion from negative to positive.

Immunisation.—Schick testing is desirable, followed by full immunisation in positive reactors and a single stimulating dose in young negative reactors. Vaccination and revaccination against smallpox and the enteric fevers should be encouraged.

Prevention and Control of Tuberculosis.—In view of the special danger of this disease, the young student and assistant should be assured that special protective measures will be taken. All should be tuberculin-tested within two months of entry into the hospital or training school. Freshly made Old Tuberculin, from 0·01 to 1 mg., or P.P.D. 0·00002 to 0·001 mg. should be used and 10 mm. or more of swelling at 72 hours taken as a positive reaction. If tuberculin-negative, the nurse should be retested every three months until positive.

Radiography of the chest will be undertaken on entry, and then annually unless Mantoux-conversion or suggestive symptoms occur before that time. Mantoux-negative nurses should be encouraged to report promptly any cough, fever, and loss of appetite or weight.

Nurses who are Mantoux-negative should not work on tuberculosis wards unless strict measures to prevent massive infection are enforced. The striking if limited value of B.C.G. vaccination shown by the Scandinavian surveys suggest that this procedure could be a useful addition to the measures already described.

Cases of known tuberculosis should not be admitted to general wards and sputum from any patient should be promptly examined for tubercle bacilli.

Treatment on "Conversion."—No general agreement on this point has yet been reached, but personal experience, together with discussions with many friends working in the tuberculosis service, suggests the advisability of the following measures.

Nurses without symptoms or X-ray evidence of the primary complex may remain on full duty. They should be encouraged to retire early to bed and to avoid strenuous exercise for the next month and be seen at the end of three months. If still normal, they should have further X-ray films at the end of the year or earlier if symptoms of any kind develop.

Those without symptoms but with a raised erythrocyte-sedimentation rate and with a visible primary complex in the lungs, should remain in bed in hospital until the E.S.R. is normal. If the X-ray film then shows no progression they can take up part-time duties, with a return to full duty in three months.

Nurses who are ill and show radiographic signs of extensive or progressive primary tuberculosis should be treated in a sanatorium for as long as necessary.

Positive reactors require radiography on entry and annually thereafter. If they lose weight or develop anæmia, cough, or indigestion special investigation will of course be needed.

CARE OF THE SICK NURSE

Any nurse must be able to report sick at any time without fear of rebuke. In particular she must learn to understand the potential danger to herself and her patients of such minor illnesses as the mild cold and the septic blister. The reluctance of trained staff to pay attention to such matters, and of administrators to release—for so slight a cause—nurses sorely needed on the ward, must be overcome. The nurse, too, should have direct access to the responsible physician without the intermediate permission of matron or home sister.

The sick-ward accommodation should be generous and attractive so that non-resident as well as student nurses will be encouraged to accept treatment in hospital. To assist this further, a free choice of the senior medical staff should be allowed. Table XVII is instructive here, especially in view of the profession's devotion to this principle in relation to the general public. Even with generous convalescence, loss of working time is almost certainly lower in those treated in hospital.

HEALTH EDUCATION

Explanation is the first essential of coöperation. Each group of students and assistants should be told the nature of, and reasons for, the careful supervision of their health during their stay in hospital. If stress is laid on the relative ease with which departures from normal can be corrected in the early stages, a sense of security and a desire to coöperate prevails from the beginning. Any abnormality, uncertain shadows in the chest film, lowered hæmoglobin, loss in weight, a high sickness-rate, or the like, should be discussed in private with the nurse concerned. Nurses are particularly apprehensive about tuberculosis, and find it very difficult to understand the significance of Mantoux-testing. Nurses should be encouraged to take an intelligent interest in the sickness records of their own hospitals and a pride in a high standard of health. Simple advice should be given on feeding, sleep, and the full use of leisure; and it is here that welfare supervisors should prove their worth. At the same time no physician concerned with the nurses' health can afford to ignore the feeding and recreational facilities in his own hospital. In the hospital of which I am writing, committees to watch over these two activities were established in 1942 and have worked actively ever since.

WASTAGE AND ITS PREVENTION

Wastage has been considered in detail for two reasons. First, ill health plays a major and previously unsuspected part in the process. Secondly, such analysis reveals something of the relation between health and environment in the genesis of this complex problem. The health and well-being of nurses in hospital is a function of many circumstances and activities between which rigid lines cannot be drawn. Time lost through illness is costly to the hospital, the nurse, and the patient. The cost to the hospital can be measured in financial terms; the cost to the nurse is often personal disappointment and professional failure; while the cost to the patient may be a limited quantity and a poorer quality of nursing care.

With our clearer understanding of the nature of d and our more effective remedies for infective il should now be possible, without further knowledge, reduce substantially the present level of sickness hospital nurses.

Summary

The health of 300 nurses in a general hospital studied during the three years 1943–45. The extent sickness was assessed by the number completely from sickness, the average amount of sickness per and the proportion of each group with " sickness " (more than 50 days in the year), and figures for the three main groups were:

	Trained nurses	*Student nurses*	*Ass and auxi*
Free from sickness	11% ..	38% ..	16%
Average sickness per head per annum..	7 days ..	8 days ..	13
Sick more than 50 days per annum	5% ..	10% ..	12%

It is very probable that the health of hospital is less satisfactory than the health of women in professions and that this excessive illness is due to respiratory infection, skin sepsis, diarrhœa, infectious fevers, and tuberculosis.

Of the 300 nurses, 18 (6%) developed tub. during the survey, with the loss of 3000 working There were no deaths from this disease during the years.

Ill health was found to play a large and unsuspec part in wastage; 17% of those leaving the hospital 25% of those leaving the profession (at least temp did so for this reason.

In the light of this and other surveys the concerned in the reasonable care of the hospital nu health are considered and a number of practices propo which could be carried out readily in most hospitals.

It is very pleasant to remember all who helped so genero with records and administration, comment, and encou ment: especially Mrs. Lang and Miss Herrington, the ma and assistant matron; Mr. G. Stephen, the medical dire Dr. Barham Carter, Dr. Gordon Signy and Prof. R. C. Bro and Mr. H. Campbell, *the statistician.*

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ROLOGICAL EFFECTS OF OXYGEN IN CHRONIC COR PULMONALE

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YGEN, at pressures up to one atmosphere, is generally ded as a safe and important therapeutic agent in estive heart-failure due to chronic disease of the lungs mic cor pulmonale). The deficient oxygen saturation e arterial blood, which is a prominent feature of this ition, is in most cases rapidly alleviated, with corre- ding clinical improvement. Relief of anoxia in this is thought to assist myocardial function, and should le the oxygen requirements of the tissues to be met a cardiac output below the high level found in eated cases of this disease (Howarth et al. 1947).

cent experience in this department suggests that en therapy may produce changes in the intracranial lation of patients with chronic cor pulmonale, and untoward effects sometimes follow.

CASE-RECORDS

se 1.—A man, aged 48, was admitted to hospital on 26, 1948, under the care of Prof. C. H. Stuart-Harris, ongestive heart-failure with deep cyanosis secondary to nic bronchitis and emphysema. His alkali reserve was l. of CO_2 %. When oxygen was given either by B.L.B. or by oxygen tent his arms developed uncontrollable lonic movements, his head and neck sweated profusely, he complained of a fullness in the head. When oxygen was drawn these symptoms disappeared. Signs of tetany l not be elicited.

se 2.—A man, aged 49, was first admitted to hospital r the care of Dr. A. R. Kelsall in February, 1948, with a nosis of congestive heart-failure due to chronic bronchitis emphysema. He had polycythæmia (hæmatocrit 67%), his vital capacity was 1·7 litres. Venesection, rest in bed, mercurial diuretics caused rapid improvement, and the nt was discharged relatively well.

hen readmitted on Nov. 12, 1948, he had more severe estive heart-failure, with very deep cyanosis and moderate ma. Oxygen was given intermittently through a B.L.B. on the day after his admission without ill effect. Next the patient took breakfast normally and spoke sensibly. r breakfast he was given oxygen by B.L.B. mask at t 6 litres a minute. Two hours later he was found nscious by the ward sister and could not be roused. as in deep coma, but his colour was pink in spite of very low respiration; the oxygen mask was still in place. e was a very heavy sweat on his head and neck, and he was ating profusely. His blood-pressure was 115/75 mm.

There were no localising signs in the nervous system. tar responses were flexor. The alkali reserve was ol. of CO_2 %. Because of his shallow breathing the patient given a mixutre of oxygen (90%) and carbon dioxide o) for a short time; this increased the rate and depth spiration and raised his blood-pressure to 170/120 mm. Hg. patient remained unconscious and died two hours later.

ecropsy. (By Dr. J. L. Edwards; 24 hours after death.) rain: weight 1450 g. Deeply congested and slightly matous; a small subarachnoid hæmorrhage, not exceeding l., over the upper surface of the right frontal lobe. On ed-eye examination, larger cerebral vessels showed no eroma or aneurysm; no evidence of embolus or thrombosis. tologically, small vessels and capillaries engorged: small unt of blood in subarachnoid space and in some Virchow- bin spaces; no evidence of fat-embolism.

ungs: small bilateral pleural effusions, slight emphysema. rulent

Comment.—Because of the recent experience with case 1, it was thought that the onset of coma in case 2 might be due to oxygen intoxication. In retrospect it seems that the administration of carbon dioxide was the worst treatment possible for the patient, and may have contributed to his death; but this was not appreciated at the time.

We have not found any published descriptions of the post-mortem appearances of the brain in oxygen poisoning, but the clinical and pathological findings in case 2 bear a striking resemblance to those in cases reported by Hunter (1949) as "anæsthetic encephalopathy."

OBSERVATIONS ON PATIENTS WITH AND WITHOUT COR PULMONALE

The neurological manifestations in cases 1 and 2 suggested that oxygen, as normally given for therapeutic purposes, might produce changes in the cerebral circulation in patients with chronic cor pulmonale. The effect of oxygen on the pressure of the cerebrospinal fluid (C.S.F.) in 4 such patients (cases 3–6) was therefore compared with that in patients with other diseases (cases 7–11).

Methods.—A lumbar-puncture needle of moderate gauge was introduced into the spinal theca between L3 and L4 or between L4 and L5, with the patient lying on the left side at an angle of 30° to the horizontal; the needle was connected to a special manometer 2·5 mm. in diameter and 500 mm. long, care being taken to avoid loss of C.S.F. Gases were administered to the patient by B.L.B. mask or by anæsthetic mask with a soda-lime reabsorber. All observations were made when the patients were relaxed.

A. Cases of Cor Pulmonale

Case 3.—A man, aged 56, with a history of dyspnœa, cough, and sputum since being gassed in the 1914–18 war. He had been disabled by dyspnœa for a year and œdematous for eight weeks. He had recently recovered from a right hemiplegia when the observations were made.

On examination he was deeply cyanosed; venous pressure increased and slight œdema. Chest emphysematous with widespread bronchospasm and basal râles. Pulse-rate 100 per min., regular: blood-pressure 180/80 mm. Hg.

Investigations.—Radiography showed cardiac enlarger and congested pulmonary vessels. Electrocardio showed right ventricular hypertrophy. Vital 1·3 litres; alkali reserve 75 vol. of CO_2 %; arte unsaturation 10 vol. %; hæmatocrit 65%.

Case 4.—A man, aged 55, with a history cough and sputum, two years' dyspnœ swelling of the legs: no angina.

On examination he was deeply venous pressure and œdema. He chest with gross scoliosis, and cl poor chest expansion. Basal r min., with occasional extra mm. Hg (falling to 160/80

Investigations.—Radi and partial long-stan cardiography show rotation of the b 77 vol. of CO hæmatocrit

Case 5 fourte swel

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Vit

TABL
Effect
As
6 litres a

Duration of oxygen administration (min.)
Zero
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
30.0

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work: Dr. A. R.
Dr. J. L. Edwards
dan for biochemical

normal, they should have further X-ray film the year or earlier if symptoms of any kind d

Those without symptoms but with a rai sedimentation rate and with a visible prim the lungs, should remain in bed in hospital is normal. If the X-ray film then shows no can take up part-time duties, with a return three months.

Nurses who are ill and show radiographic or progressive primary tuberculosis should sanatorium for as long as necessary.

Positive reactors require radiography annually thereafter. If they lose we anæmia, cough, or indigestion special of course be needed.

CARE OF THE SICK NURS

Any nurse must be able to report without fear of rebuke. In particula to understand the potential danger t patients of such minor illnesses as the septic blister. The reluctance of tr attention to such matters, and of release—for so slight a cause—nurse the ward, must be overcome. The have direct access to the responsibl the intermediate permission of mat

The sick-ward accommodation and attractive so that non-residen nurses will be encouraged to accept To assist this further, a free choice staff should be allowed. Table X especially in view of the professi principle in relation to the gener generous convalescence, loss of certainly lower in those treated i

HEALTH EDUCA

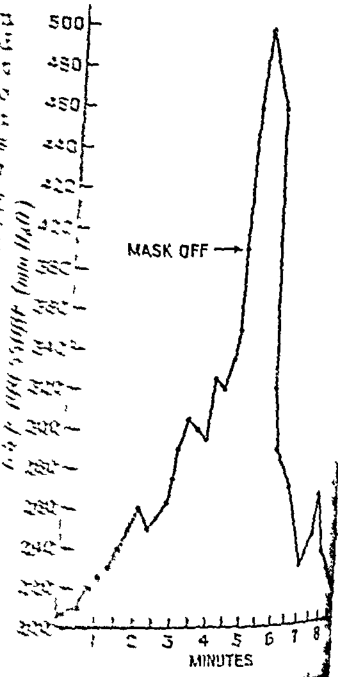
Explanation is the first essenti group of students and assistants of, and reasons for, the care health during their stay in hos the relative ease with which de be corrected in the early stag a desire to cooperate prevails abnormality, uncertain shadov hæmoglobin, loss in weight, like, should be discussed in p cerned. Nurses are partic tuberculosis, and find it ve the significance of Mantoux-t encouraged to take an intellig records of their own hospitals dard of health. Simple advice sleep, and the full use of leis welfare supervisors should p same time no physician con health can afford to ignore the facilities in his own hospital. I am writing, committees to activities were established in actively ever since.

WASTAGE AND ITS

Wastage has been considered First, ill health plays a major an part in the process. Secondly something of the relation betw ment in the genesis of this compl and well-being of nurses in hospi circumstances and activities bet cannot be drawn. Time lost th the hospital, the nurse, and the the hospital can be measured in cost to the nurse is of professional failure ; cost a limited quantity and qualit

e reabsorber in the circuit valve. There was a very rapid starting within 30 seconds and the resting level. The about 4 minutes, but the for a further minute ; thereafter original level (fig. 1 and table 1). the head and neck. The this patient ten times on four

shows that a rise in C.S.F. pressure administration in the 3 other patients pulmonale (cases 4–6). In all these pressure was high. The relative



Effect of breathing pure oxygen, th apparatus at 6 litres a minute reabsorber in the circuit and expir in cor pulmonale (case 3)

and in most cases was follow

ple observations it appeared caused a significant rise in with chronic cor pulmonale, but ients examined. Further observati clude the possibility that the change ue to the discomfort of breathing cumulation of carbon dioxide within or giving gas.

the discomfort of the mask to prevent the accumulation of carb the apparatus, a simple anæsthetic m anterior opening was held on to the patien assistant. Gases were given through a tu the opening in front of the mask (fig delivered in large volumes to ensure that bon dioxide should be driven out of the sp sk and face. In fig. 3 the effect of oxyg theal pressure of a patient with chronic contrasted with the effect of air given nd at the same rate. Oxygen caused as that observed after it had mask or an anæsthetic mas pressure to fall. This seemed factor as a cause of the ob

thod of giving gas through
assed through the opening
sk.

rise in pressure, and indicated that oxygen was the factor responsible.

(2) As an extension of this last experiment, and to discover whether the phenomenon was confined to pure oxygen, a further observation was made. Air was given to a patient (case 5) with chronic cor pulmonale through a B.L.B. mask at 10 litres a minute; the intrathecal pressure fell and remained below the resting level. Without the mask being moved, a mixture of 50% oxygen and 50% nitrogen, at the same rate of flow, was substituted for air;
arked rise in pressure took place as in former
ions. While the pressure was still rising, air was
re given, and the pressure fell to the resting
. 4).

DISCUSSION

1 and 2 indicate a possible harmful effect of
n cor pulmonale, and the experimental findings
that one such effect is a sharp rise in C.S.F.

We have not demonstrated a similar increase
hecal pressure in the few controls yet examined,
the 4 cases of cor pulmonale (cases 3–6) exhibited
in C.S.F. pressure within a few minutes after
dministration had started. Our observations are
it inadequate to determine whether this effect of
s related to any particular stage of the process
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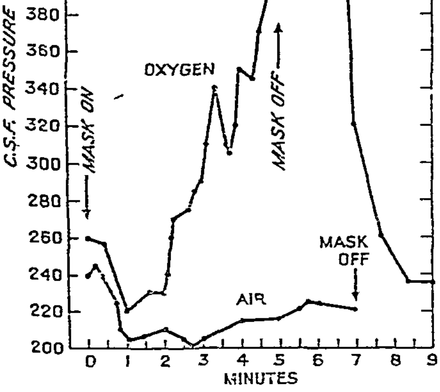

Fig. 3—Comparison of effects of giving oxygen through a tube (see fig. 2), and of giving air in the same way, at 10 litres a minute in cor pulmonale (case 3).

Similar high C.S.F. pressures were recorded by Harrison (1934) in various forms of congestive heart-failure.

It appears unquestionable that the changes observed in the intrathecal pressure reflect similar changes in intracranial pressure. So far as the immediate mechanism is concerned, the rapidity of the fluctuations in pressure suggests an effect on the calibre of the cerebral vessels and accompanying changes in blood-flow. The cerebral vessels are known to dilate when carbon dioxide is given to patients undergoing cerebral operations, and in animals whose pial vessels have been exposed (Cobb and Fremont-Smith 1931, Lennox and Gibbs 1932). We have obtained a sharp increase in the intrathecal pressure by giving carbon dioxide to some of the controls used in connexion with observations on the effect of oxygen. An increase in intrathecal pressure following the giving of oxygen does not, however, seem to have been recorded before.

The changes in intrathecal pressure in cor pulmonale after the giving of oxygen are possibly linked with changes in the metabolism of carbon dioxide. The theory that oxygen intoxication is due to accumulation of carbon dioxide in the body, because of interference with the transport of carbon dioxide by hæmoglobin (Gesell 1923), may explain our findings. Patients with emphysema, especially those with chronic cor pulmonale, are known to retain carbon dioxide, as shown by the high alkali reserve, and a further increase in the carbon dioxide in the tissues might produce toxic symptoms. Work is now in progress in an attempt to confirm or refute this hypothesis. Meanwhile, it is considered that the experiences recorded here should lead to caution in giving oxygen to patients with chronic cor pulmonale.

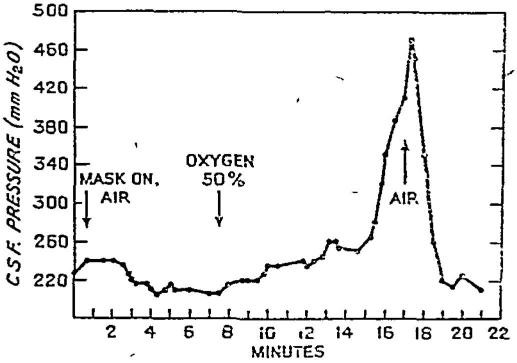

Fig. 4—Comparison of effects of giving oxygen and of giving air at 10 litres a minute through B.L.B. mask in cor pulmonale (case 5).

SUMMARY

Two cases of chronic cor pulmonale are reported in which adverse effects followed the giving of oxygen. In case 1 oxygen was the probable cause of myoclonic arm movements; in case 2 it probably caused coma and may have contributed to death.

Experiments showed that oxygen given in concentrations of 50–100% to patients with chronic cor pulmonale causes a sudden increase in C.S.F. pressure. Such an increase was not observed in controls.

Our thanks are due to Prof. C. H. Stuart-Harris for his assistance and advice and for facilities for the work; Dr. A. R. Kelsall for permission to publish case 2; Dr. J. L. Edwards for the necropsy findings; and Dr. A. Jordan for biochemical results.

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TABLE I—RESPONSE OF PATIENTS WITH COR PULMONALE TO OXYGEN

Duration of oxygen administration (min.)	Intrathecal pressure (mm. of C.S.F.)			
	Case 3	Case 4	Case 5	Case 6
Zero	205	485	305	370
0·5	210	490	340	375
1·0	225	500	365	385
1·5	240	520	400	395
2·0	260	525	435	395
2·5	255	528	460 (mask removed)	400
3·0	290	535	485	405
3·5	300	565 (mask removed)	450	410
4·0	325	Manometer overflowing	350	415
4·5	335	„ „	315	420
4·75	390 (mask removed)	„ „	..	..
5·0	460		285	..
5·25	500	"565"	280	..
5·5	480	555	..	..
6·0	290	525	280	430
6·5	270	505	275	..
7·0	230	480	..	435
7·5	245	480	..	..
8·0	235	480	..	..
8·5	220	..	..	..
9·0	205	..	..	435 (mask removed)
10·0	..	..	..	400
11·0	..	..	..	375
12·0	..	..	..	365
13·0	..	..	..	360
14·0	..	..	..	350

spasm. Pulse-rate 96 per min., regular; blood-pressure 130/70 mm. Hg.

Investigations.—Radiography showed chronic fibro-phthisis, and enlargement of the pulmonary conus and heart. Electrocardiography showed right ventricular strain. Vital capacity 1·1 litres; alkali reserve 77 vol. of CO_2 %; arterial oxygen unsaturation 5 vol. %; hæmatocrit 40%.

B. Controls

Case 7.—A married woman, aged 48, with mitral stenosis, auricular fibrillation, venous congestion, and œdema, but no cyanosis.

Case 8.—A man, aged 48, with gastric carcinoma and peritoneal metastases and ascites, but no cyanosis or evidence of congestive heart-failure.

Case 9.—A single woman, aged 74, with iron-deficiency anæmia. Her Hb was 20% (Haldane), her venous pressure was not raised, and she had no œdema.

Case 10.—A single woman, aged 35, with chronic bronchitis, asthma, and slight emphysema, but no cyanosis. Alkali reserve 60 vol. of CO_2 %.

Case 11.—A man, aged 46, with chronic duodenal ulcer no cyanosis.

RESULTS

of Breathing Pure Oxygen in Cor Pulmonale

n initial investigation, oxygen was given at minute to case 3 through anæsthetic apparatus with a carbon-dioxide reabsorber in the circuit open expiratory valve. There was a very rapid C.S.F. pressure, starting within 30 seconds and a height $2^1/_2$ times the resting level. The removed after about 4 minutes, but the tinued to rise for a further minute; abruptly to the original level (fig. 1 and table I). was sweating over the head and neck. The was repeated in this patient ten times on four similar results.

Table I shows that a rise in C.S.F. pressure oxygen administration in the 3 other chronic cor pulmonale (cases 4–6). In all these resting C.S.F. pressure was high. The relative in pressure after oxygen had been given varied somewhat from patient to patient, and in case 6 was trivial. No attempt was made to find the highest C.S.F. pressure attainable or the duration of the response.

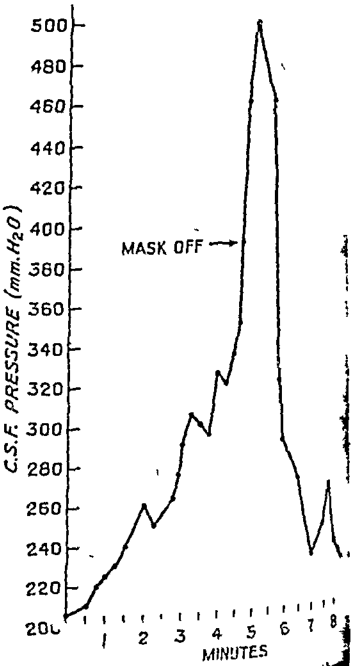

Fig. 1—Effect of breathing pure oxygen, thr anæsthetic apparatus at 6 litres a minute w CO_2 reabsorber in the circuit and expir valve open, in cor pulmonale (case 3).

Control Observations

The five patients who were not suffering from chronic cor pulmonale and were not cyanosed (cases 7–11) were studied in the same way. Oxygen breathing for up to 30 minutes caused no rise in intrathecal pressure, and in most cases was by a fall (table II).

TABLE II—RESPONSE OF CONTROLS TO OXYGEN

Intrathecal pressure (mm. of C.S.F.)				
Case 7	Case 8	Case 9	Case 10	Case 11
217	215	240	225	100
10	210	225	225	85
5	205	215	235	80
	197	200	220	65
	190	200	220	70
	192	195	220	85
	192	200	215	80
	192	195	210	95
	195	200	210	95
	195	205	208	115
	195	210	200	115 *
	..	215	200	125
	..	..	..	120 *
	..	..	..	120
	..	..	..	115
	..	..	..	115

nt moved.

Further Observations

From these simple observations it appeared breathing oxygen caused a significant rise in c. pressure in patients with chronic cor pulmonale, but in the other patients examined. Further observati were made to exclude the possibility that the change pressure were due to the discomfort of breathing mask, or to accumulation of carbon dioxide within apparatus used for giving gas.

(1) To eliminate the discomfort of the mask harness, and to prevent the accumulation of car dioxide within the apparatus, a simple anæsthetic m with a large anterior opening was held on to the patien face by an assistant. Gases were given through a tu passed through the opening in front of the mask (fig. and were delivered in large volumes to ensure that expired carbon dioxide should be driven out of the sp between mask and face. In fig. 3 the effect of oxyg on the intrathecal pressure of a patient with chronic pulmonale is contrasted with the effect of air given the same way and at the same rate. Oxygen caused same rise in pressure as that observed after it had given through a B.L.B. mask or an anæsthetic mac whereas air caused the pressure to fall. This seemed exclude any mechanical factor as a cause of the ot

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ıd received A.P. for five months in another hospital. ·ver was intermittent, with an evening maximum of F; sputum was positive, and E.S.R. 100 mm. in 1 hour. graphy revealed thickening of the right parietal pleura orizontal fissure, and a productive lesion in the right zone. Laryngoscopy revealed tuberculosis.

ptomycin therapy was started on Dec. 15, 1948, and ued until 60 g. had been given by Feb. 11, 1949. The t's temperature became normal on Dec. 20, 1948, and arseness and pain disappeared on Feb. 16, 1949, when oscopy revealed complete healing. She is still in the rium, with evening rise of temperature to 100°F; n culturally positive, E.S.R. 66 mm. in 1 hour. Radio- ly there is appreciable reduction in the extent and y of the pulmonary lesions. The patient's weight sed by 15 lb. Period of observation 11 months.

e 3 (IIIC).—A man, aged 25, was admitted on May 19, with twelve months' history of cough and fever. He ceived 22 inductions of A.P. in another hospital. His rature was intermittent, with an evening maximum of F; his sputum was positive, and his E.S.R. 28 mm. in r. Radiography showed an exudative lesion with tion in the right upper and mid lobes, with involvement left perihilar zone. The patient was also diabetic. On isin and insulin the temperature settled to 99·8°F, the n became negative, and the urine became sugar-free.

ptomycin was started on Dec. 19, 1948, because of per- pyrexia, and continued until 40 g. had been given by 27, 1949. On Dec. 25, 1948, the temperature became l. He was discharged on Feb. 25, 1949, his temperature remained normal since Dec. 25, 1948. His sputum egative, his E.S.R. 7 mm. in 1 hour, and radiologically sions in both lung fields had resolved and no cavity pparent. Period of observation 17 months.

e 4 (IIIC).—A woman, aged 30, was admitted on Dec. 15, with a month's history of fever, rigors, cough, and y. Her temperature was remittent, with an evening num of 102°F, her sputum was positive, and her E.S.R. 12 mm. in 1 hour. Radiography revealed a productive in the left upper and mid zones. The patient refused

ptomycin therapy was started on Dec. 24, 1948, and ued until 54 g. had been given by Feb. 28, 1949. The it was discharged at her request on March 3. Her rature had been normal since Jan. 2, her sputum had legative since the end of January, her E.S.R. was 74 mm. our, and radiologically there was an appreciable reduction density of the lesion in the left upper zone. Period of vation 10 months.

se 5 (IIIC).—A woman, aged 25, was admitted on April 28, with eight months' history of irregular fever and chills. emperature was intermittent, with an evening maximum 1°F, her sputum was positive, her E.S.R. was 105 mm. hour, and radiography showed an exudative lesion in ft subclavicular zone with evidence of tissue breakdown. vas treated by A.P. from May 3, 1948, to July 31, 1948. ondition did not improve, and radiography on Aug. 9, showed a spread of tuberculosis to the right subclavicular

eptomycin therapy was begun on Sept. 13, 1948, because pneumothorax developed that day. By Oct. 14, 1948, had been given, and from that day the patient's tem- ure remained normal. She was discharged on May 14, Her sputum had been negative since Jan. 26, and her was 100 mm. in 1 hour. Radiography showed resolution e focus on the right side and encystment of the residual on on the left side. The patient had put on 24½ lb. in ıt. Period of observation 12½ months.

se 6 (IIIC).—A man, aged 24, had been admitted four weeks' history of cough and fever. He had 6 A.P. inductions on the right side elsewhere. On ssion his temperature was intermittent, with an evening mum of 101·2°F, his sputum was positive, his E.S.R. 98 mm. in 1 hour, and radiography showed collapse of pper and mid right lobes, slight collapse of the right lower and an exudative lesion in the right lung and in the left r lobe.

reptomycin was given on Sept. 11, 1948, because A.P. outside had made his condition worse and his general ition was bad. By Jan. 12, 1949, 80 g. had been given. patient's temperature came down to an evening maximum of 99°F on Sept. 15, 1948, and his E.S.R. came down to 64 mm. on Jan. 5, 1949. He gained 31 lb. in weight, but his sputum remained positive. On Jan. 17, 1949, A.P. was begun, because he was now in a suitable condition for it. On Feb. 1, 1949, he got benign tertian malaria, which was soon subdued. On Feb. 16 he had a profuse hæmoptysis, which was soon controlled, but radiography showed recent reinfection of the left mid zone and extensive tissue breakdown, with large cavities, in the right upper lobe. The patient's temperature rose to 101°F. Streptomycin was given again on Feb. 21, and continued until 108 g. had been given by March 21, when his temperature came down to 99·5°F. The patient was discharged on July 21. Period of observation 10 months.

Case 7 (IIIC).—A man, aged 48, was admitted on Sept. 30, 1948, with two months' history of cough and pain in the chest. His temperature was remittent, with an evening maximum of 101·4°F, his sputum was positive, his E.S.R. was 96 mm. in 1 hour, and radiography showed an exudative lesion involving practically the whole of both lung fields, lobular in distribution. A.P. was contra-indicated.

Streptomycin therapy was started on Oct. 5, 1948, and continued until 42 g. had been given by Nov. 19, 1948. The patient was discharged on April 29, 1949, and his temperature had been normal since the very first day of streptomycin therapy. He had gained 18½ lb. in weight. But his sputum was still positive and E.S.R. at the same level. Radiologically there was appreciable resolution on the right and early fibrotic changes on the left. Period of observation 7 months.

Case 8 (IIIC).—A police constable, aged 30, was admitted on Nov. 9, 1948, with three months' history of cough, fever, and pain in the chest. He had been treated for pulmonary tuberculosis in 1946 in another sanatorium, had received there A.P. and gold treatment, and had been discharged after six months as fit for duty. On admission his temperature was intermittent, with an evening maximum of 101·8°F, his sputum was positive, his E.S.R. was 114 in 1 hour, and radiography showed an exudative lesion in the upper half of either field.

Streptomycin therapy was begun on Dec. 21, 1948. Up to Jan. 15, 1949, the patient received 1 g. daily, making a total of 26 g. His response being unsatisfactory, his temperature going up to 103°F, the dose was doubled to 2 g. a day up to Feb. 1, making a grand total of 60 g. His temperature did not abate, and radiography showed an increase in the epituberculer exudation and recent spread to both bases. His sputum continued positive, and his E.S.R. rose to 130 mm. in 1 hour, though he gained 7½ lb. in weight. He was discharged on May 30. Period of observation 6½ months.

Case 9 (IIIC).—A man, aged 54, was admitted on Feb. 13, 1948, with a history of productive cough, fever, and debility of indefinite duration. He was acutely ill and orthopnœic. His temperature was remittent, with an evening maximum of 100°F, his sputum was positive, and his E.S.R. was 142 mm. in 1 hour. His liver was enlarged, and his urine was loaded with albumin. Radiography showed a productive lesion with cavitation in the left upper and both mid zones. A.P. was out of question.

Streptomycin therapy was begun on March 23, 1948, and continued until 18 g. had been given by April 10, 1948. The patient left on May 12, 1948, because his dyspnœa had completely disappeared, his temperature had been normal since April 5, 1948, his weight had increased by 14 lb., and he thought he could look after himself. On his discharge his sputum was positive, radiography showed a recent spread of tuberculosis to both lower lobes, but his E.S.R. had fallen to 94 mm. in 1 hour. He maintained his improvement for two months, but then migrated into Hyderabad State, where he died during the second week of August.

RESULTS IN GROUPS II–VI

The results obtained in the 20 cases in these groups are summarised in tables II and III, which show that, out of 20 cases, response in 13 was favourable, in 4 doubtful, and in 3 unfavourable. Out of 7 in the doubtful and unfavourable category 5 came from groups II and III. Sex seems to have shown no predilection, but ages between 14–25 years reflected better results.

Illustrative Case-records

Case 10 (group II).—A woman, aged 35, was admitted on March, 1948, with four weeks' history of cough, fever, and

STREPTOMYCIN IN HUMAN TUBERCULOSIS

STUDY OF 47 CASES

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IN India the number of sanatoria is far from being commensurate with the requirements of the population, and general hospitals are averse to admitting tuberculous patients for whom they cannot provide effective treatment. If only the fever of these patients could be controlled, a great step forward would have been taken, for then those who became fit for surgical intervention could be selectively tackled in the sanatoria. Any therapy, therefore, which improved their general condition would be especially welcome in India. If toxæmia and fever can be controlled, the patient's morale rises, and he may then allow the doctor the surgical approach to his body which otherwise he will refuse point-blank.

We report here on the potentialities and limitations of streptomycin as they appear from an inquiry conducted in the Government Wellesley Sanatorium. We set out to answer the following questions:

(1) In what types of pulmonary tuberculosis can streptomycin be used with advantage?

(2) What is the optimum dose of streptomycin, and at what intervals must it be administered?

(3) Is its beneficial effect temporary or permanent?

(4) What are its untoward effects, and how can they be prevented or treated?

(5) Will streptomycin work better when given concurrently with other drugs?

(6) Can streptomycin therapy take the place of present methods of treatment?

(7) What is the smallest quantity of streptomycin required to tide the patient over and make him turn the corner when gravely ill, so that routine surgical treatment may be adopted?

METHOD

Streptomycin hydrochloride (Squibb) and streptomycin sulphate (Pfizer) were used. The sulphate caused less pain and therefore was preferred. Streptomycin 0·5 g. in 2 ml. of distilled water was given intramuscularly morning and evening. For intrapleural injections 100 mg. in 10 ml. of distilled water was given, once a day.

CLASSIFICATION OF TUBERCULOSIS

Though the classification recommended by the Tuberculosis Association of India (see appendix) is used in this sanatorium, for the purposes of this inquiry the following classification based on radiological findings was considered more informative and therefore adopted:

Group I.—Exudative or productive lesion (of different stages) without caseation or fibrosis.

Group II.—Mainly a lobar lesion, which is considered to be of an adolescent primary type, clinically running a fulminating course.

Group III.—Mainly a caseous, fibrotic, or mixed lesion—i.e., where irreversible changes have already taken place.

Group IV.—The main lesion is extrapulmonary—e.g., in the gastro-intestinal tract or in the bone—the lung lesion being minimal.

Group V.—The lesion is complicated by pleural effusion.

Group VI.—Miliary tuberculosis. (1) Acute: radiologically there are numerous dots of opacity, of universal distribution in both the lung fields; in a typical case there is miliary disease, the meninges being commonly (2) Chronic: the distribution is universal in both lung being perhaps more marked in the upper zones. The are coarse and less uniform than in acute miliary and generalised miliary disease is uncommon. The may or may not show an old lesion.

RESULTS IN GROUP I

The results obtained in the 27 cases in this group summarised in table I, which shows that the favourable results were obtained in cases either class IIIC, in patients aged 14–25 years, and in more than in men.

The average quantity of streptomycin given cases in class IIIC was 46·1 g. The longest time streptomycin to show favourable results was 48 and the shortest 1 day (3 cases).

Illustrative cases from group I are briefly re below. Every patient within a few days of rec streptomycin showed a well-marked change in becoming optimistic with a sense of well-being. those patients who are shown as having given unfavourable response appreciably improved as re toxæmia, in that their temperature changed from tinuous and remittent to intermittent, with a evening maximum, but they did not maintain improvement. This statement applies to all the group I and therefore is omitted from table I, with mention of concurrent and consequent modes treatment and of common intercurrent diseases such malaria, dysentery, and oral infection.

Illustrative Case-records

Case 1 (IIB).—A woman, aged 20, was admitted on De 1947, with nine months' history of cough, fever, and lo weight. Her temperature was intermittent, with an maximum of 100°F, and her sputum was positive erythrocyte-sedimentation rate (E.S.R.) was 44 mm. in (Westergren). Radiography showed exudative infil in the right mid zone and left hilar region. Treatment artificial pneumothorax (A.P.) and 'Myocrisin' till 1948, produced an unsatisfactory response.

Streptomycin therapy was started on April 29, 1948, continued until 66 g. had been given by July 4, 1948. May 6, 1948, the patient's temperature came down to nor and remained there. On Jan. 31, 1949, she was discha as "disease arrested," with normal temperature, sput negative since July, 1948, E.S.R. 33 mm. in 1 hour, radiolo showing appreciable reduction in both extent and density both lung fields; and having gained 19½ lb. in weight admission. On June 1, 1949, she was well and doing household duties. Period of observation 6 months.

Case 2 (IIB).—A woman, aged 38, was admitted on Nov. 1948, with twelve months' history of cough, fever, and debili and two months' history of pain in the throat and hoarsen

TABLE I—RESULTS OF STREPTOMYCIN THERAPY IN

—		Favourable response			Doubtful response—i.e., stationary condition	Unfavourable response	
		Arrested	Much improved	Improved		Worse	D
A.I.T.A. classification	IB–IIIB	3	2	..	..	..	..
	IIIC	1	2	3	10	1	5
Sex	M	3			10	5	
	F	8			..	1	
Age (yr.)	14–25	9			3	[illegible]	
	26–37	1			5	[illegible]	
	38–49	1			2	1	
	Over 50	..			..	[illegible]	
Temperature	–99°F	1			0	1	
	–100°	0			2	[illegible]	
	–101°	5			2	1	
	–102°	4			6	[illegible]	
	102° +	1			0	0	

9, 1948, the evening maximum of the patient's tempera- ell to 99°F, and from July 5, 1948, his temperature ied normal. Radiography on July 9, 1948, showed ion of the focus on the right but increase of effusion ie left oblique fissure; on Sept. 19, 1948, radiography d appreciable resolution of the interlobar effusion. Dec. 2, 1948, the sputum became consistently negative, S.R. fell to 8 mm. in 1 hour, the patient gained 18 lb. ght, and radiography showed evidence of resolution on ft side on Feb. 23, 1949. The patient was discharged b. 23. Period of observation 11 months.

e 16 (group VI(1)).—A man, aged 22, was admitted on , 1949, with fifteen days' history of fever and cough. emperature was 102°F, his sputum negative, and his 50 mm. in 1 hour. The radiological findings were in ig with acute miliary tuberculosis.

ptomycin therapy was started on Jan. 9, and continued 10 g. had been given by Feb. 27, after which the patient ut on myocrisin in addition to sanatorium régime. His rature remained normal from Jan. 25; his sputum ued to be negative, his E.S.R. remained at the same level; graphy showed no change, and he felt well and had $13^{1}/_{2}$ lb. in weight. He is still in the sanatorium. Period servation 9 months.*

se 17 (group VI(2)).—A man, aged 21, was admitted on 26, 1948, with two months' history of fever and produc- cough. His temperature was intermittent, with an ng maximum of 101°F, his sputum was positive, his was 30 mm. in 1 hour, and radiological findings were stent with chronic miliary tuberculosis (autogenous minated type).

eptomycin therapy was started on Sept. 21, 1948, and nued until 42 g. had been given by Jan. 5, 1949. The erature fell and remained normal from Sept. 28, 1948; putum became negative from March 20, 1949; the nt gained 36 lb. in weight; and radiography showed eciable reduction in extent as well as the density of the s in both lungs. The patient is still in the sanatorium, taining his improvement. Period of observation 13 hs.

COMMENT

ryngeal Tuberculosis.—In group I there were 3 cases aryngeal tuberculosis in addition to pulmonary rculosis. One of these, already described (case 2), onded well. The other two (IIIC), with more advanced ionary infection, did not respond so well.

osage.—Double doses of streptomycin were given to tients: 1 received 2 g. to start with, and 3 were given a day to start with, and then doubled to 2 g. because response was not encouraging. Since the increase in ge did not show any benefit it was given up. It is that 1 g. a day is the optimum dose in pulmonary rculosis in an average Indian patient. The average y-weight of the patients was $86^{1}/_{2}$ lb.—the maximum g $138^{1}/_{2}$ lb. and minimum 50 lb. I have already ribed 2 of these 4 cases (nos. 8 and 12).

ases of Special Interest.—Case 10 died of cardiac ire. The patient received 45 g. of streptomycin, left sanatorium with incomplete treatment, and was imitted to die within two hours. In contrast case 2 onded favourably after only 20 g., and that too given rruptedly. In this case the streptomycin was given at the critical stages. As soon as the toxæmia was trolled, the streptomycin was stopped. In this nexion it is of interest to review the other patients received more than twice the average quantity of ptomycin: case 6 (108 g.); case 12 (105 g.); and 14 (106 g.). None of them responded favourably. ne other patients, whose cases are not described ve, were also given doses of streptomycin larger than al. It seems that a limited quantity of streptomycin en in optimum dosage at critical times is more bene- al than is protracted treatment in larger dosage, which may not confer greater benefit. Even those patients who ultimately did not respond favourably showed transient improvement in their general condition. It is our clinical impression that the existence of natural strains of tubercle mycobacteria resistant to streptomycin cannot be ruled out. Indeed, in view of the favourable response obtained with very limited quantities of streptomycin in some cases, it seems probable that the natural susceptibility of different strains of Koch's bacilli to streptomycin varies widely.

Radiology.—Except in acute miliary tuberculosis, an X-ray film of the lung in pulmonary tuberculosis will reveal lesions of different types and of various ages. It is generally possible to spot the older lesions which have been responsible for the more recent spread. It is in these recent ones that early favourable response must be looked for. In the older lesions where fibrosis or caseation has taken place no appreciable response need be expected. Case 12 is an example of this. The usual early evidence of improvement is reduction in the extent of lesions only. Since most of our patients were given myocrisin at some stage, it is considered premature to credit streptomycin wholly and solely for salutary results in the favourable cases. The time-lag between cessation of the treatment and appreciable radiological findings is explained by the fact that necessary tissue changes must occur before they show themselves radiologically. When the pleura are involved, both the absorption of the fluid and/or resolution of pleural thickening are apparent only after months. Case 5 is an example of this. For the purpose of prognosis the type of the lesion, rather than its extent as seen on the film, appears to be more important. The more recent the lesion, the greater the chances of an early favourable response.

CONCLUSIONS

The answers to the queries which our investigation was planned to cover are as follows:

(1) Streptomycin does good in all types of cases in which no irreversible changes have taken place. The best results are to be expected in stages earlier than IIIC. Women seemed to respond better than men, and the age-group of 40 years or more was less favourable.

(2) Our experience is in favour of 1 g. a day in doses of 0·5 g. morning and evening.

(3) There has not been enough time to follow up the cases as laid down by the All India Tuberculosis Association, according to which three years after discharge as "arrested" is the criterion before a patient can be declared cured.

(4) No untoward effects requiring special treatment were noted; a few patients complained of giddiness during the earlier stages of treatment. The only measure adopted to combat it was to suspend the treatment for a while and to renew it later.

(5) Administration of other routine treatments during the course of streptomycin is not contra-indicated but does not seem to confer any additional benefit. *para*-Aminosalicylic acid was tried in one case without advantage.

(6) The adoption of other routine treatments after a course of streptomycin, when the patient has turned the corner from a critical stage, is both necessary and beneficial to maintain results already achieved.

(7) In this series 11 g. of streptomycin was the smallest quantity which gave benefit. It is felt that the best method will be to administer streptomycin during the critical stage and, once the toxæmia has been controlled, to revert to A.P. and other methods of treatment. Therefore the smallest dosage of streptomycin required cannot be rigidly laid down. It differs from patient to patient,

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nother case of acute miliary tuberculosis, in a boy aged 10 years, admitted on July 25, 1949, and treated with streptomycin for 18 days, resolved completely—as if a mirror had been wiped clear of dust particles. Period of observation 3 months.

debility. She had a remittent temperature, with an evening maximum of 104°F, her sputum was positive, her E.S.R. was 30 mm. in 1 hour, and radiography showed an extensive lesion of lobar distribution in the right upper zone and recent spread to the left upper and both mid zones. She was considered unsuitable for A.P., did not respond to the usual *sanatorium régime, and was therefore put on streptomycin* on May 20, 1948. By July 9, 1948, she had had 45 g. On and after May 27, 1948, her temperature became intermittent, with an evening maximum of 101°F, but her E.S.R. rose to 95 mm., and radiography on June 24, 1948, showed extensive fresh lesions in both fields, with tissue breakdown in the upper zone. She lost $3^1/_2$ lb. in weight and left the hospital on July 9, 1948, only to be readmitted on Aug. 31, 1948, to die within a few hours.

Case 11 (group II).—A girl, aged 19, was admitted on Sept. 8, 1948, with three months' history of cough, fever, and loss of weight. Her temperature was intermittent, with an evening maximum of 102°F, her sputum was positive, her E.S.R. was 102 mm. in 1 hour, and radiography showed an exudative lesion of lobar distribution in the right upper lobe with evidence of tissue breakdown, and on the left a recent spread of tuberculosis in the mid zone. She was unsuitable for A.P., and routine treatment and myocrisin did her no good.

Streptomycin therapy was therefore begun on Sept. 24, 1948, and continued until 15 g. had been given by Oct. 8, 1948. Another short course, of 5 g., was begun on Nov. 19, 1948. The *patient was discharged on April 18, 1949, and her temperature* had been normal and her sputum negative since November, 1948; her E.S.R. was 83 mm. in 1 hour on March 15, and radiography on March 11 gave appreciable evidence of resolution in either mid zone, with crenation at the right apical zone. She gained $21^1/_2$ lb. in weight. Period of observation 7 months.

Case 12 (group III).—A man, aged 51, was admitted on Aug. 17, 1948, with six months' history of fever and cough. His temperature was intermittent, with an evening maximum of 102°F, his E.S.R. was 104 mm. in 1 hour, his sputum was positive, his urine contained 2% sugar, and radiography showed fibrocaseous involvement of whole of the left field and an early exudative focus in the second anterior intercostal space on the right. The glycosuria was controlled without *any effect on the patient's health.*

TABLE II—RESULTS OF STREPTOMYCIN THERAPY IN GROUPS II-VI

Group	Favourable response			Doubtful response—*i.e.*, stationary condition	*Unfavourable response*		Total
	Arrested	Much improved	Improved		Worse	Died	
II	..	1M	1F	..	1F	1F	4
III	..	..	..	3M	..	..	3
IV	4F	1M	..	..	..	..	5
V	2M	..	1F	..	1F	..	4
VI(1)	..	..	1M	..	..	..	1
VI(2)	..	1M 1F	..	1M	..	..	3

F, female. M, male.

Streptomycin was given in a double dose to start with, 2 g. a day, from Aug. 17, 1948, and continued until 76 g. had been given by Sept. 22, 1948. This made no difference. Since the patient's liver was slightly enlarged and by previous experience we expected some improvement in his temperature, search was made for *Entamœba histolytica* infection, with success. Treatment for amœbiasis lowered the range of the patient's temperature to a maximum height of 100°F. Streptomycin therapy was again started, 1 g. a day being given from Nov. 3, 1948, and continued until Dec. 1, 1948, by which time 105 g. had been given. The patient's temperature became normal from Nov. 8, 1948, and he went away on Dec. 2, 1948, without waiting to be cured. His temperature had remained normal, his E.S.R. was 102 mm. in 1 hour, his sputum was positive, he had gained $9^1/_2$ lb. in weight, and radiography showed resolution with early calcification in the right field but no appreciable change in the left. The patient is alive and not following a restricted mode of life. Period of observation 14 months.

Case 13 (group IV).—A woman, aged 20, was admitted on May 20, 1948, with six months' history of indigestion and umbilical pain worse after defæcation, the stools being and loose but without blood or mucus. Fifteen days admission she had developed fever, with œdema over dorsum of each foot. Her temperature was remittent, evening maximum of 102°F, her sputum was E.S.R. was 102 mm. in 1 hour, and radiography showed productive lesion in the left subclavicular region. tuberculosis was tentatively diagnosed.

TABLE III—RESULTS IN TABLE II SET OUT ACCORDING TO GROUPS

Group	Age-group (years)											
	14–25			26–37			38–49			Over 50		
	Favourable response	Doubtful response	Unfavourable response	Favourable	Doubtful	Unfavourable	Favourable	Doubtful	Unfavourable	Favourable	Doubtful	Unfavourable
II	1F		1F	1M	..	1F		..			..	
III	..		..	..	1M	..		1M			1M	
IV	3F		..	1M 1F	..	..		..			.	
V	..		..	2M 1F	..	1M		..			..	
VI(1)	1M		..	..	..			..			..	
VI(2)	1M 1F		..	..	1M	..		..			..	

F, female. M, male.

Streptomycin therapy was begun on May 26, 1948. A meal examination was done only on July 8, 1948, because general condition had been low. This confirmed the diagnosis, Sterlin's sign being clearly positive. By July 1948, 66 g. of streptomycin had been given. The temperature gradually came down and remained normal July 17, 1948. *Diarrhœa ceased completely* within a starting treatment. The patient sought discharge on Oct. 1948, when the lung lesion showed appreciable radiography, the E.S.R. had fallen to 9 mm. in 1 hour; had gained 28 lb. in weight, and all other signs and had disappeared. Her present condition is reported to be satisfactory. Period of observation 17 months.

Case 14 (group V).—A man, aged 32, was admitted Jan. 8, 1948, with twelve months' history of fever and cou He had had A.P. elsewhere. His temperature was with an evening maximum of 99°F, his sputum was his E.S.R. was 72 mm. in 1 hour, and radiography hydropneumothorax on the left side, with adhesions at apex, and a spread of tuberculosis to the upper right *There were also enlarged cervical* glands. Sanatorium ré did not benefit the patient, and paracentesis for the effusion produced a sinus.

Streptomycin therapy was started on April 8, 1948, in 10 ml. of distilled water being given *in* the removal of an equal quantity of effusion daily. By Ju 1948, 11·2 g. had been given. On May 27, 1948, the pati temperature became normal, the cervical glands resolved, the sinus cleared, but the sputum remained positive. August the patient's evening temperature rose to 100°F his weight decreased by $6^1/_2$ lb. There was no change in e *the sputum* or the E.S.R. Intramuscular streptomycin now given, up to a total of 30 g. by Sept. *1, 1948.* His perature remained normal from Sept. 8 to Sept. 11, 1948, then rose to 102°F, the sinus reopened, and radiogr showed no improvement. Another course of strepton from Oct. 6, 1948, to Jan. 3, 1949 (106 g.) did not benefit patient, and he went home on Jan. 7 with a pulmonary fis opening into the left pleural cavity (seen after the installat of 'Lipiodol') and recent *involvement* of the right lu Period of observation 12 months.

Case 15 (group V).—A police constable, aged 30, admitted on March *26, 1948*, with five months' history fever, cough, and debility. His temperature was intermitt with an evening maximum of 100·4°F, his sputum was p tive, his E.S.R. was 96 mm. in 1 hour, and radiography sho an effusion *in the left pleural cavity* and into the left obl fissure, and early (Assmann's) focus with *central* cavitat in the 2nd right anterior intercostal space. A.P. given the left side failed; so also did an attempt at left ph evulsion. The pyrexia continued *unabated.*

Streptomycin therapy was started on May 14, 194 continued until 48 g. had been given by July 5, 194 istered. In addition to A.C.T.H., the following unds were tested:

nene-(4)-triol-(17α,20β,21)-one-(3)-diacetate
nane-3,12,20-trione
ethylΔ5-androstendiol-3 (β), 17 (α)
hydroxyprogesterone
hydroxy-11-desoxycorticosterone-21-acetate
xycorticosterone acetate
stanyl acetate.

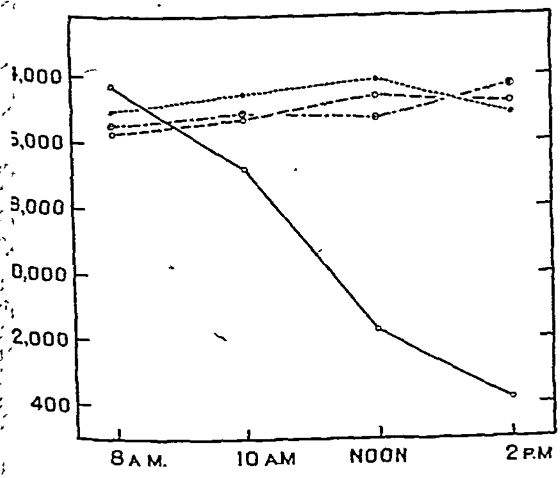
compounds tested were injected in similar amounts t similar intervals, and since the response, or lack ponse, as the case might be, was parallel in each of hree patients, we shall illustrate by a single case ary.

hite woman, aged 64, was treated in the Nutrition in April, 1949, for nutritive failure (Spies 1947). An ntal finding was a consistently elevated eosinophil-. Careful studies show no evidence of allergies or parasitic tions. Frequent blood determinations during the next nonths showed a total white blood-cell count which l from 6250 to 8142 per c.mm., 32–51% of the cells eosinophils.

en we were ready to initiate the test period, the patient nstructed not to eat after her evening meal and to to the Nutrition Clinic at 7 the following morning. sted from 7 to 8 A.M. and (still under fasting conditions) l white blood-cell count and total eosinophil-count were She was then given 25 mg. of A.C.T.H. intramuscularly. r blood determinations were made at 10 A.M., 12 NOON, P.M. The results are shown in fig. 1. As can be seen, was a definite drop in the eosinophils. By the following ng they had returned to the previous high level. She llowed 72 hours "to rest" and was then given an ion of pregnene-(4)-triol-(17α,20β,21)-one-(3)-diacetate.

owing a 72-hour rest period between injections, this nt received an injection of each of the compounds l above, and in that order. Her eosinophil-count injection of the first three compounds is shown in . and after injection of the remaining four is shown . 2. After all compounds had been tested, she was another injection of A.C.T.H., with the sharp drop e number of circulating eosinophils as shown in .

ter making these tests, it seemed desirable to inister each of the materials to selected patients with acute rheumatoid arthritis. All injections were given intramuscularly and some of them were followed by local irritation, swelling, and pain. These studies, along with others, will be reported subsequently, and it suffices to say now that none of the seven steroids reported here had an ameliorating effect in any way comparable to A.C.T.H., as observed by Hench et al. (1949) and ourselves (Spies and Stone 1949). In only a few instances was there any suggestion of a decrease in the severity of the arthritis, and in these it was not measurable by objective indices such as a return of sedimentation-rates to normal. Hence it will require more time, and more of these materials than we had available, to determine whether they have a slight beneficial effect. In contrast, when the patients were later given A.C.T.H. they began to respond within 24 hours. In each case within 72 hours there was a spectacular decrease in swelling and a great increase in mobility of all the affected joints.



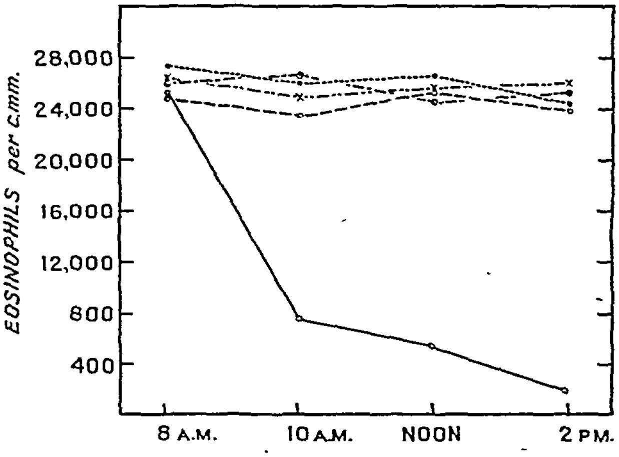
○——○ Absolute eosinophil-count following administration of 25 mg. A.C.T.H. at 8 a.m.

●------● Absolute eosinophil-count following administration of 50 mg. pregnene-(4)-triol-(17α, 20β, 21)-one-(3)-diacetate at 8 a.m.

○——○ Absolute eosinophil-count following administration of 50 mg. pregnane-3, 12, 20-trione at 8 a.m.

○-·-○ Absolute eosinophil-count following administration of 50 mg. 17-methyl Δ 5-androstendiol-3 (β), 17 (α) at 8 a.m.

Fig. 1.



○——○ Absolute eosinophil-count following administration of 25 mg. A.C.T.H. at 8 a.m.

●------● Absolute eosinophil-count following administration of 100 mg. 17 α-hydroxyprogesterone at 8 a.m.

○— —○ Absolute eosinophil-count following administration of 100 mg. 17-α-hydroxy-11-desoxycorticosterone-21-acetate at 8 a.m.

○-—-○ Absolute eosinophil-count following administration of 50 mg. desoxycorticosterone acetate at 8 a.m.

×-·—-·× Absolute eosinophil-count following administration of 50 mg. ergostanyl acetate at 8 a.m.

Fig. 2.

SUMMARY AND CONCLUSIONS

Three persons with chronic eosinophilia of unknown causation were selected for study. Under basal conditions each was injected with purified pituitary adrenocorticotropic hormone (A.C.T.H.), with the result that there was a rapid decrease in the absolute number of circulating eosinophils. Since it is generally thought that the injection of A.C.T.H. results in an increase in cortisone, we injected seven chemical substances somewhat related in structure to cortisone. None of these compounds caused a decrease in the number of circulating eosinophils, which shows that this test has some specificity. We have tested these sterols on persons with rheumatoid arthritis and have not observed improvement which is at all comparable to that following the injection of A.C.T.H.

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depending on various factors, such as age, sex, stage, class, and group of case. *Haphazard administration of streptomycin in private practice, unless backed by institutional or expert advice, should be forbidden in India.* Apart from the fact that streptomycin-resistant strains exist in nature, there is the danger of dollar drain which India cannot afford unless well fortified by successful results. Last year £3,000,000 was spent in India on streptomycin.

SUMMARY

47 cases of tuberculosis treated with streptomycin are analysed. These cases were separated into six groups: group I exudative, group II pneumonic, group III fibrocaseous, group IV intestinal, group V pleural in addition to pulmonary, and group VI miliary—(1) acute, and (2) chronic.

Of 27 cases in group I, 11 gave a favourable response; of 4 in group II, 2; of 3 in group III, none; of 5 in group IV, 5; of 4 in group V, 3; of 1 in group VI(1), 1; and of 3 in group VI(2), 2.

The shortest period of observation was 6 months and the longest 17 months.

Cases less advanced than IIIC responded most favourably, women better than men, and the age-group 14–25 came out best.

Case-records of illustrative cases are given, and a questionary set before the investigation is answered.

Administration of streptomycin other than institutional, or other than by experts, is deprecated.

We thank Colonel S. L. Bhatia, F.R.C.P., Surgeon-General with the Government of Madras, for permission to publish this paper, and the matron, sisters and nurses for their always willing coöperation.

Appendix

The classification of cases of pulmonary tuberculosis as recommended by the All India Tuberculosis Association is as follows:

Stage I.—*A lesion affecting not more than one zone or, if there is a lesion overlapping two zones, the extent of the total lesion should not cover more than one zone.* If there is *bilateral affection, it should be grouped in this stage only if the lesion is not below the clavicle on one of the sides and the total extent of the lesions is less than one zone.* No case with cavities should be grouped in this stage. If there is complete pneumonic consolidation of one zone, even if it is confined to one zone only, it should be grouped in stage II.

Stage II.—*In unilateral disease, the lesion should not extend* to more than two zones. In bilateral disease the lesions should *not extend to more than one zone on each side*, and the total extent should not be more than the equivalent of two zones. If there is cavitation, it must be limited to a single cavity the diameter of which is not more than 2 cm. If there is no X ray all cases with cavitation should be placed in stage III. If two zones are completely consolidated, even without cavitation, the lesion should be grouped in stage III.

Stage III.—All lesions more advanced than those grouped in stage II, and all with *a cavity larger than 2 cm. in diameter*, or with multiple cavities; and all cases with spontaneous pneumothorax associated with an active tuberculous lesion in the lung.

In addition to the above, primary considerations according to the lung lesion, complications both tuberculous and non-tuberculous have to be taken into account.

Such tuberculous complications as laryngeal tuberculosis, tuberculous enteritis, extensive tuberculosis, *osteo-articular* tuberculosis, renal tuberculosis, pleurisy with effusion, polyserositis, and meningeal tuberculosis, *and* such non-tuberculous complications as diabetes, kala-azar, and pregnancy must be taken *into consideration* in classification. Patients with these complications are generally put one stage down—e.g., a patient classified in stage I according to the anatomical extent of the lung disease would be classified in stage II if he has also laryngeal tuberculosis. If the complication is very severe, or if there is more than one complication, the patient is classified in stage III.

The degree of systemic effect should be noted end of a week's observation, after which the stages be subdivided into A, B, and C, as follows:

A.—Constitutional disturbances, absent or slight, judged *mainly* by *temperature*, pulse-rate, influence nutrition and strength, wasting, E.S.R., and blood As regards temperature, the average maximum in the over a week after half an hour's rest in bed should not 99°F oral or 99·8°F rectal; the average pulse-rate week should not ordinarily exceed 90 per min.; the and blood picture should not vary much from the

B.—Constitutional disturbance moderate—i.e., *between A and C. No serious complications affecting* organ or tissue seriously impairing function, local or *tutional.*

C.—Severe constitutional disturbance. The average of maximal temperature over a week with the patient at exceeds 100·4°F oral, 101°F rectal; the average over a week exceeds 96 per min.; the E.S.R. is high and blood picture considerably deviated from normal.

A SCREENING TEST OF CHEMICAL COMPOUNDS FOR PITUITARY ADRENOCORTICOTROPIC HORMONE ACTIVITY *

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Thorn, Forsham, Prunty, and Hills (1948) showed in normal subjects the circulating eosinophils consistently after the injection of purified pitui adrenocorticotropic hormone (A.C.T.H.), and demonstrat the usefulness of this test in diagnosing adre *insufficiency.* Since the A.C.T.H. stimulated the adre cortex and resulted in the increased production of adrenal sterol 'Cortisone' (17-hydroxy-11-dehydr corticosterone) in the normal person but not in the per with adrenal insufficiency, it seemed worth determin the effect on the circulating eosinophils of selected ster injected under the same conditions as A.C.T.H. For study we selected three patients with eosinophilia.

These three patients had all been studied *for at* le six months. During this time the eosinophil-count each case had never been less than 2000 per cubic metre by absolute count or less than 20% of the white blood-cells by differential count using Wrig stain. *The patients ate no food* during the hours preceding the injection. At 8 A.M., under *conditions*, white *blood*-cell counts, differential and absolute eosinophil-counts by the method of Thor *et al. (1948)* were *done.* Immediately after the 8 A count the A.C.T.H. or the test compound (suspende *in saline or in benzyl alcohol)* was injected intra muscularly into the buttocks. The blood-counts wer done again *at* 10 A.M., 12 NOON, *and* 2 P.M. After the injection of A.C.T.H., three days were allowed *to* elap and the test substances were *given* three days apar After all the test substances had been administered, thre days were allowed *to* elapse *and* A.C.T.H. was aga

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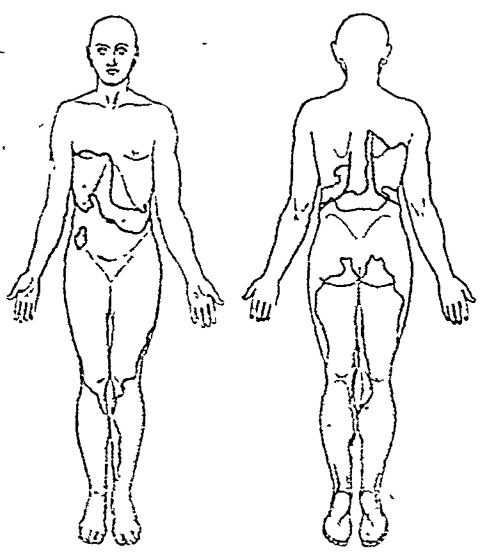
* These studies were aided by a grant from the Martha Le Sherwin Memorial Fund, and were done with *the* techn assistance of Miss Helen Grant, Mrs. Mary Koch, Miss Hel *Lopez, and* Miss Martello Moore. The A.C.T.H. was supp through the courtesy of Dr. Kenneth W. Thompson, Or Inc., Orange, New Jersey.



(a)—Loss of thermoregulatory sweating in patient after thoraco-bar sympathectomy (left, T.10-L.3; right, T.4-L.2), 12 weeks r operation on left side and 3 weeks following that on the right.

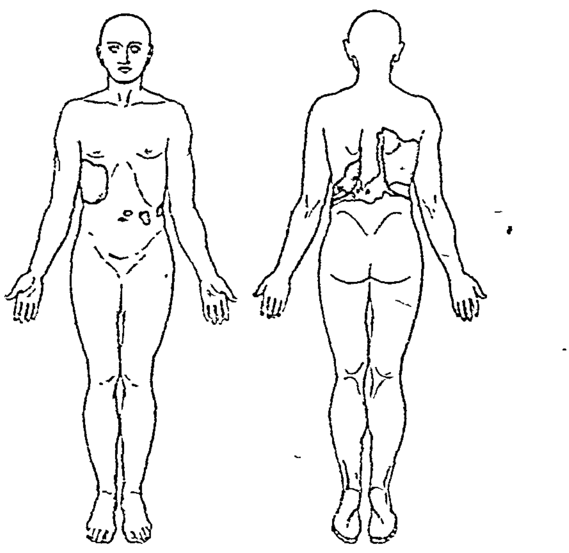


Fig. 2(b)—Absence of sweating in the patient figured in 2(a) following injection of carbachol.

tomy ultimately decreases so that from 2 weeks to nths postoperatively it ceases to occur." This test been applied in one of our cases.

g. 2(a) shows the thermoregulatory sweat pattern patient who had paravertebral sympathectomy L.2 performed on the right side and T.10–L.3 -L.3) on the left. Six days after this test, instead at being applied, this patient was given an injection cholinergic drug (carbachol 0·5 mg. intramuscularly). his occasion—fig. 2(b)—the whole of the lower lumbar sacral regions showed sweating activity but the sweating area on the thorax persisted though it was extensive than in the first test and consisted only chain of islands on the left side. In both these on this patient the observations with the skin-tance meter were confirmed by the quinizarin sweat (Guttman 1947) and have been photographed. As use sweating was not induced, deeply stained patches not produced everywhere, but the pore of each vidual active gland was stained blue. The patterns weating in each instance were similar but that of skin-resistance method showed the presence of slight ating one to two centimetres beyond the margin of quinizarin reacting areas.

AN ALTERNATIVE AUTONOMIC PATH ?

he existence of a sudomotor "escape" area in the 2, and 3 dermatomes after thoracolumbar sympa-ctomy, as described above, has already been recorded chter and Woodruff 1945, Ray and Console 1948, rd 1948). It suggests to us that an alternative omotor pathway persists intact after the operation. y and Console, indeed, have already indicated a ief in the existence of such an alternative pathway. ey did not, however, track it down further than to ite that

> "the residual pathways to the T.12–L.3 area arise from the corresponding anterior spinal roots. The first lumbar roots seem to play the predominant rôle, but as the pathways can be blocked by tetraethylammonium chloride the usual preganglionic and postganglionic fibres must be present. The position of the ganglion cells is uncertain, but may be in the plexus about the aorta, behind the psoas muscle, or in the lumbar nerves themselves. The fibres are not distributed to the T.12–L.3 dermatomes via the periarterial sympathetics, but enter the nerves of the lumbar plexus close to their points of origin and reach their final distribution via these nerves."

Hyndman et al. (1948) subsequently criticised Ray and Console for postulating a system of fibres hitherto unrecognised in the literature. Figs. 2(a) and (b) indicate to us that in this patient there was postganglionic (and preganglionic) denervation of the sweat-glands in the lower thoracic dermatomes but retention of postganglionic function in the lower lumbar and sacral regions. As, however, T.12–L.3 dermatomes showed continued thermoregulatory sweating, these segments must have retained the normal, or at least part of the normal, preganglionic and postganglionic innervation of the sweat-glands.

OBSERVATIONS ON THE FŒTUS

Our clinical observations, and Ray and Console's results, led us to examine a large number of human embryos and fœtuses in an attempt to locate the autonomic cells of the residual pathway. Much of this material is stained with silver impregnation methods in which the sympathetic nervous system is often demonstrated with diagrammatic clearness. Examination of this

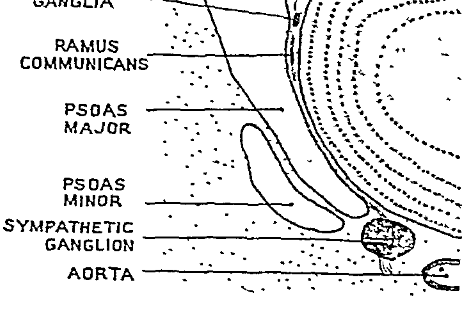


Fig. 3—Camera-lucida drawing of section through the level of the right 2nd lumbar sympathetic ganglion in a 100 mm. C.R. length human fœtus: the section shows five intermediate ganglia in relation to the anterior primary division and a ramus communicans.

PARTIAL RETENTION OF AUTONOMIC FUNCTION AFTER PARAVERTEBRAL SYMPATHECTOMY

(INTERMEDIATE LUMBAR SYMPATHETIC GANGLIA AS THE PROBABLE EXPLANATION)

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DEMONSTRATOR OF ANATOMY

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During an investigation of the effect of thoracolumbar sympathectomy on autonomic function we have observed that an "escape" area of sweating constantly persists in the lower abdomen and front of the thighs, corresponding to the 1st and 2nd lumbar segmental dermatomes and possibly including the 12th thoracic and the 3rd lumbar. The operations were performed in two stages, in the neurosurgical unit of the London Hospital, on patients with severe benign and malignant hypertension. Usually the 8th thoracic to the 3rd lumbar sympathetic ganglia inclusive, together with the splanchnic nerves, were removed by an extrapleural approach, and more recently the resection has extended from the 4th thoracic to the 3rd lumbar ganglia. Clips were placed on the upper and lower ends of the remaining paravertebral chain and the levels checked by radiography. Therefore, according to current opinion, if the lower limit of the thoracolumbar outflow of the sympathetic is taken as the 2nd lumbar nerve (or rarely the 3rd), as confirmed in man by Sheehan (1941) and Pick and Sheehan (1946), such an operation should achieve a complete section of postganglionic fibres (and, indeed, preganglionic fibres) between the levels of T.8 (or T.4) and L.3 inclusive, and section of preganglionic fibres only for L.4 and lower segments.

CLINICAL OBSERVATIONS

Patients were examined, after inducing gentle sweating in a heating cabinet, by the electrical skin-resistance method using a microammeter and 9–18 volts D.C. (Accurate and precise observations will not be obtained unless the patient is sufficiently heated to induce sweating and unless these higher voltages are employed.)

Typical patterns in two patients are shown in figs. 1 and (*b*). They agree fairly closely with the illustrations lished in a well-reasoned paper by Ray and Console (1 though in our cases the borders of the "escape are more variable and asymmetrical, frequently "islands and peninsulas." These patients were examined after each operation but were seldom enough before the twelfth day. A dye sweat test usually performed, for this requires longer heating, is not well tolerated by these patients. Sweat after the first and second operations and at later up to nine months show fairly close agreement variations as occur are probably best explained re-innervation from neighbouring sweating areas, or *later fibrosis at the site of ganglionectomy,* extension of a non-sweating area.

In general we have found that after tho sympathectomy, thermoregulatory sweating is a belt around the lower thorax and upper though occasionally it may persist over the spine is fairly profuse over the lower abdomen, groin, perineum, and upper buttock (lumbar dermatomes) on the front of the thigh and inner side of the calf, it is absent on the leg below this level and on the dermatomes except around the perineum. That is, is segmental autonomic denervation from T.8 (or T caudally but sparing of segments T.12–L.3. These terns show the anatomical limits of sweating; the of sweating on the front of the thigh is less than before operation. This suggests to us probably there is *only* partial denervation of the glands in this area. But it is also possible that are in part supplied by overlap from the seg above.

A pharmacological test was originally suggested *List and Peet (1938)* as a method for disting between preganglionic and postganglionic denervatio sweat-glands. Further studies have been made Hyndman and Wolkin (*1941*) and by these investiga with van Allen (1948) who used pilocarpine and mech on *cases of cervicothoracic sympathectomy.* observed that if the ganglion cells and postgangli fibres are intact (i.e., following preganglionic section o these drugs in small dosage will *continue* to c sweating in areas which no longer show thermoregula sweating and in their opinion, this is due to action the neuroglandular junction (end plate). They state that "drug sweating *after* postganglionic sym

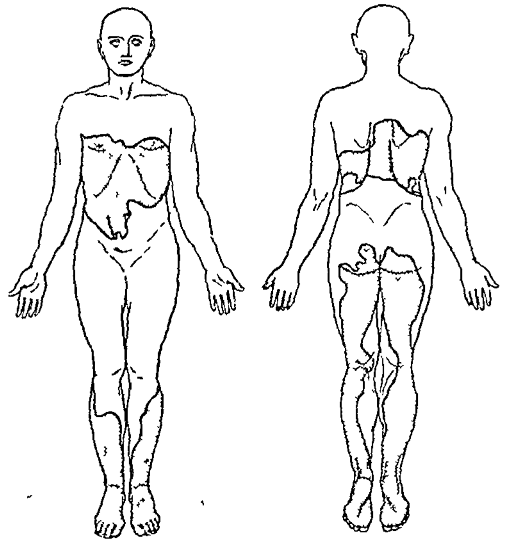

Fig. 1(*a*)—Loss of thermoregulatory sweating in patient after thoracolumbar sympathectomy (T.4-L.3), *13 weeks after operation on the* left side and 20 weeks after that on the right.

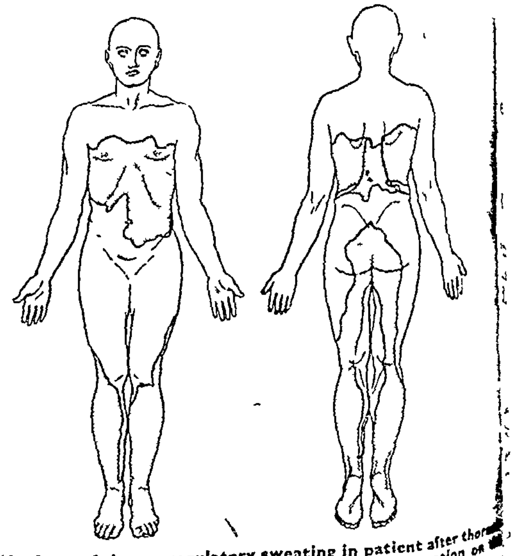

Fig. 1(*b*)—Loss of thermoregulatory sweating in patient after thor lumbar sympathectomy (T.4-L.3), 8 weeks after operation on left side and 4 weeks after that on the right.

In figs. 1 and 2 stippling shows areas of high electrical skin resistance indicating absence of sweating.

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Reviews of Books

thalmic Medicine

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Contribución del Coeficiente Citológico a la Fisiología y Patología de la Correlación Hipofisotiroidea

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Society and its Criminals

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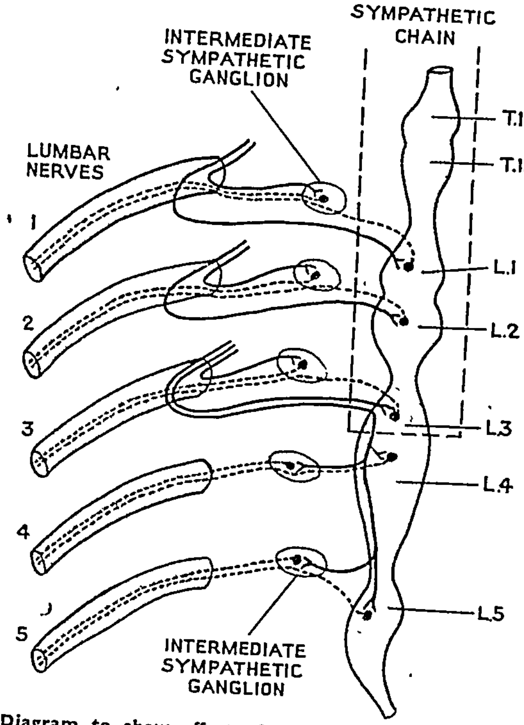
1. H.M. Stationery Office, 1949; se , 1053.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material revealed the presence of numerous "intermediate" sympathetic ganglia, of varying size and distribution, in the course of the rami communicantes passing between the lumbar sympathetic ganglia and the corresponding anterior primary rami of the lumbar nerves.

These intermediate ganglia are situated for the most part dorsal to the psoas muscle or between its posterior fibres of origin (fig. 3). They are on the course of the more dorsal of the rami communicantes of L.1, 2, and 3—i.e., the rami considered to be of the grey variety. The ganglia may be at any point along the rami, either near the sympathetic chain, in an intermediate position, or close to the lumbar nerves; indeed, some of them are on the surface of, or embedded in, the anterior primary rami. Such ganglia can also be found on the rami communicantes of L.4 and 5. The position of many of these intermediate ganglia is such that they would necessarily escape removal in the usual operation of thoracolumbar sympathectomy. It is clear (see fig. 4) that removal of the sympathetic chain isolates the intermediate ganglia associated with L.4 and 5 from preganglionic impulses unless there happen to be connexions outside the sympathetic chain. The intermediate ganglia associated with L.1, 2, and possibly 3 (and equivalent ones on T.12) may, however, be unaffected by such operations if, as we believe, their preganglionic fibres pass to them directly from the corresponding lumbar nerves without first passing in the white rami to the sympathetic chain. It is, of course, these very segments that show the retention of sudomotor activity. On studying the relevant literature we have found that Wrete in several contributions (1935, 1941, 1943a and b), has given a full description of these intermediate ganglia. We have followed him in using the term "intermediate" for them. These ganglia have also been described by Pick and Sheehan (1946), who use the adjective "intermediary" for them. In our opinion the discrepancies in loss of sudomotor activity after sympathectomies of the type described here are completely explained by the arrangement distribution of these intermediate ganglia of Wrete

COMMENT

Our findings agree with Wrete's report that intermediate ganglia are extremely variable and metrical. This variability will readily account for irregular patterns in our observations, and for "islands" and "peninsulas" of sweating or non-sweat As far as we have yet been able to determine from embryological material it does not appear that ganglia have any visceral connexions. We can offer evidence that they are concerned in the nerve-supply the kidney or the splanchnic bed.

We have also verified on our fœtal material anatomical findings of Skoog (1947) on similar in mediate ganglia in the cervical region. Indeed, in opinion, the presence of such cervical interme ganglia is a better explanation of the atypical sudom responses following sympathectomies in the region than that advanced by Hyndman et (1948).

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A more detailed and further study of these and autonomic investigations on these patients, and of intermediate ganglia, will be published in due course.

SUMMARY

1. The existence of a sudomotor "escape" belt paravertebral thoracolumbar sympathectomy has verified in the dermatome segments of T.12–L.3.

2. Attention is drawn to the presence of intermedia sympathetic ganglia at these segmental levels.

3. It is suggested that these intermediate gan together with their associated preganglionic connection and postganglionic fibres afford the anatomical explanation for the retention of sweating in the "escape" belt

4. Intermediate ganglia are also found in the cervical and in the lower lumbar regions. In the neck they may be the explanation of atypical loss of autonomic function after cervicothoracic sympathectomy. Thoracolumb sympathectomy (T.4–L.3) will deprive the intermedia ganglia of the 4th and 5th lumbar segments of the preganglionic connections.

ADDENDUM

Since this paper was written we have had the opportunity of examining post-mortem material from one patient in our series who showed a similar sudomotor escape pattern. The lower level of resection of the paravertebral sympathetic chains included each third lumbar ganglion. Microscopic examination of this material has confirmed the presence of many intermedia ganglia in the rami communicantes and primary divisions of the first and second lumbar nerves. Most of the cells of these ganglia appear normal but some show changes suggestive of degeneration. This degeneration may be grade, due to section of the corresponding post- ionic fibres.

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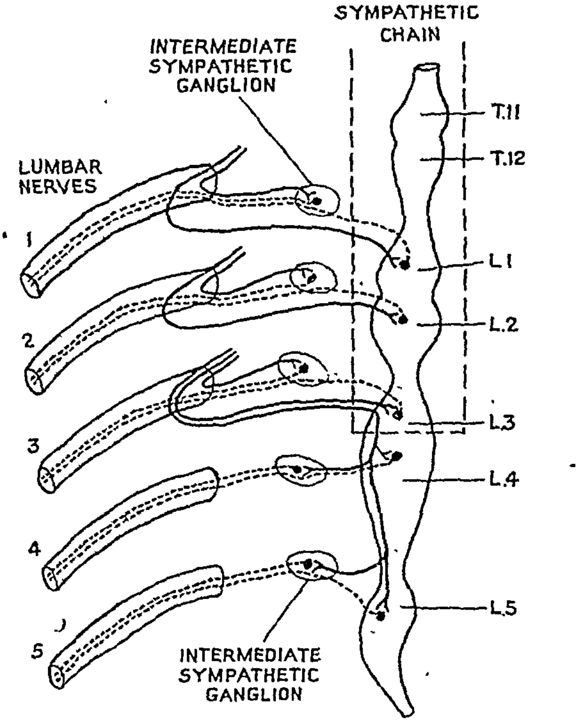
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2. Attention is drawn to the presence of intermedi sympathetic ganglia at these segmental levels.

3. *It is suggested that these intermediate gang* together with their associated preganglionic connectio and postganglionic fibres afford *the anatomical explan* tion for the retention of sweating in the "escape" be

4. Intermediate ganglia are also found in the cervic and in the lower lumbar regions. In the neck they ma be the explanation of atypical loss of autonomic functio after cervicothoracic sympathectomy. *Thoracolumb* sympathectomy (T.4–L.3) will deprive *the intermedia* ganglia of the 4th and 5th lumbar segments of the preganglionic connections.

ADDENDUM

Since this paper was written we have had the opportunity of examining post-mortem material from one patient in our series who showed a similar *sudomotor* escape pattern. The lower level of resection of the paravertebral sympathetic chains included *each* third lumbar ganglion. Microscopic examination of this material has confirmed the presence of many intermediate ganglia in the rami communicantes and primary division of the first and second lumbar nerves. Most of the cell of these ganglia appear normal but some show change suggestive of degeneration. This degeneration may be

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criminal and social psychiatry is precisely that which some modern educationists in this country, especially Herbert Read, have been trying to bridge by means of a sociological anarchism.

This book, which will undoubtedly provoke detailed criticism and study, is particularly interesting to English penologists for its contrast with the more conservative viewpoint, for its interpretation of the recent debates upon the abolition of the death penalty, and for the sharpness with which it reveals the impact of penal psychiatry on political thought. In coming to recognise that the criminal subserves an essential function in the mental dynamics of modern society, we come to accept a revolution which extends far outside the walls of the prison.

English Social Services

Methods and Growth. EMMELINE W. COHEN. London: Allen & Unwin. 1949. Pp. 158. 8*s.* 6*d.*

THIS is a rather fluffy little book, written by American ladies for American ladies. Miss Cohen and her friends, having read portions of English social history during the 19th century, have tried to present them as a scientific account of the evolution of our modern social provision for children and the poor in this country. They tell some moving stories of the sad conditions which prevailed 100 years ago among neglected, handicapped, and slum children, and they describe some of the pioneer movements of voluntary social service. But the book peters out when it comes to present-day schemes, Acts of Parliament, and statutory services that really matter. It touches on the old poor-law system, but does nothing to explain the evolution of that system, thanks to the work of the Webbs, Beveridge, and others, into our modern specialised social services. Even before July 5, 1948, this book would have had no right to its over-grand title.

Der Arzt der Persönlichkeit

Dr. Med. ERNST SPEER, Dozent für Psychiatrie und Neurologie, Lindau, Bodensee. Stuttgart: Thieme. 1949. Pp. 285. D.M. 26.

THIS book with the rather pompous title "Physician Personality" proves to be a readable and lucid position of the methods and tasks of medical psycho- erapy written for the student of psychiatry. The hor thinks the time of rivalry among schools in this d is over, and eclecticism the rule for the modern chotherapist. He has to choose from all available hods the one most suited to the individual patient. d's and Jung's teaching are presented with equal ence, Adler with much criticism; but such methods he therapeutic interview, suggestion, hypnosis, ation techniques, and painting and drawing, with indications and limitations, are fully discussed. has his own method of "contact psychology" for atment of neurotic sex inhibitions. His weakness somewhat vague and diffuse psychopathology ed by Kretschmer and Jung, but also by French try of the last century. Severe neuroses not to psychotherapy indicate "degeneration" and cept is also applied to schizophrenia. One may this as a relic of the Nazi attitude (of which is conspicuously free in all other respects) the psychiatric patient.

A l Survey of the British Pharmacopœia, 1948

n: Pharmaceutical Press. 1949. Pp. 79. 5*s.* 6*d.*

su a series of authoritative monographs on an interest to the student of modern pharmacy trermaceutical chemist. It is significant of the puelopments in this composite science that the sle t and the biochemist may dip into this of ne and find in it an interesting presentation nevects of the pharmaceutical chemistry of cistpreparations. The senior hospital pharma- parciate the practical value of the section on witections and tablets; and the book is not and t even for the entomologist. A thoughtful consive essay on the new pharmacopœia is Brit Dr. C. H. Hampshire, secretary of the copœia Commission.

Understand Your Diabetes (London: Oxford Press. 1949. Pp. 146. 7*s.* 6*d.*) and **A Handbook Diabetes Mellitus and its Modern Treatment** (4th Calcutta: Dhur & Sons. 1949. Pp. 227. Rs. 10/8). specialists are always producing small books for their leagues or patients, and here are two more. From John W. Caldwell gives us the first—a very adequate book, telling what diabetes is, and giving advice on insulin, and so on. Dr. J. P. Bose, of Calcutta, in the edition of a much more comprehensive book, writes for Indian doctors. Unfortunately the doses of insulin given are not discussed, and this whole subject is dismissed in half a page. The food tables, however, the analyses of Indian foods as well as English, are larly interesting. Unfortunately they are arranged in old-fashioned way, giving food values in terms of per oz. which makes their practical use a burden: e.g., beaten rice (chira) = 22·1 g. carbohydrate, 1·9 g. 0·4 g. fat.

Transactions of the Ophthalmological Society of United Kingdom (vol. 67. London: J. & A. 1948. Pp. 530. 40*s.*).—This volume for the year 1947 been delayed owing to difficulties in printing. It the papers read at the annual congress of the society those of the Oxford Ophthalmological Congress, the N England Ophthalmological Society, and the Midland, and Irish Ophthalmological Societies. The papers cover a wide field and there is much useful information contracted sockets, rhinology in relation to or corneal bloodstaining, and experimental tumours of the The outstanding contribution, however, is that on the mental transplantation of eyes. Dr. L. S. Stone, professor anatomy at Yale University, discussed this work in his memorial lecture. For the past twenty years he has engaged on these researches, and he was able to report and show films of, the operation of removing the eye of salamander and transplanting it to another, where it has made to grow and function as a normal eye. This has, in fact, been carried out four times on the same adult the eye remaining normal at the end of the process. So as is known, this is the first time that such an operation been carried out, and it has enabled Dr. Stone to make most accurate observation of the regeneration of the of the optic nerve. The importance of this advance great, and suggests some promise of a time when such operation may be possible in a more highly dev animal.

Anatomy and Ballet (London: A. & C. Black. 194 Pp. 77. 12*s.* 6*d.*).—This unusual little handbook, written teachers of ballet—especially young and inexperienced teachers—is by a fully qualified physiotherapist who has trained in ballet technique. Miss Celia Sparger, who is sulting physiotherapist to the Sadlers Wells School, analysed the muscle and joint movements used by danc and studied the damage that may be done, especially children, by faulty movements. The chapters on th subjects are impressive. She notes the harm the growing fo may suffer through *pointe* work begun too early. The chi who "took the audience of admiring relatives and friends by storm" may, as a young woman, be unable to find shoes fit the enlarged toe joints "which appeared long after she h forgotten all about the clapping." The fact that ma painful disabilities of middle-aged feet begin in childhood only just gaining recognition[1]; and the late results are se not by the child's mother or his dancing teacher but by th doctor and physiotherapist who have to do what they can a permanently disabled foot. The anatomy in Miss Sparger book is sound, but taken at breathless speed; and the spin in particular could have been described and illustrated with more detail. Good photographs and radiograms illustrate the text, supplemented by the clever diagrams of Mr. Eric M Agnew. If Miss Sparger reaches her audience successfully she will prevent some disabilities in a coming generation. The great teachers, as she says in her preface, need no textbook: they have a profound understanding of the movements of the body, sharpened by constant observation. Yet even they may welcome this informative little work on the actual mechanisms of movement; for, as Miss Ninette de Valois says in an introduction, "observation has a habit of sometimes turning into a long-sustained question mark."

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[1] *Lancet*, Sept. 24, p. 585.

THE LANCET

LONDON: SATURDAY, NOV. 12, 1949

The Army's Needs

he four years since the war the Army Medical es have held their own remarkably well: for omplement of Regular officers is almost full. t the end of this year the total strength of al officers is likely to be within 10% of establish- The ratio of Army doctors to population at including soldiers' families, some Colonial troops. d labour forces. and civilians (notably in the ol Commission)—is about 1·50–1·75 to 1000. conscription to end. this ratio would fall sharply,) less than half the doctors now serving have d the Army under the National Service Act. ven with continuing conscription the position is to become slightly less satisfactory. since forward more and more of the men who qualify lready have completed their military service in ray or another. As things stand, however, the hief cause of concern is not numbers but distri- n. The terms of the National Service Act apply octors only up to the age of 30: and those ited in this way are a negligible source of special- ill. For specialists, therefore, the Army looks largely to the holders of short-service commis- : and by the end of this year these are expected no less than 65% below establishment.

rhaps the main task of the Army Medical rtment in peace-time is to build up a body dministrators capable of handling the corps mushroom war-time growth: in the late erstwhile civilian doctors were able to play a and useful part in the Army because they backed by able Service administrators. But the rtment also has to provide efficiently for the care of serving soldiers, and it must therefore means of making good its deficiency of specialists. this end any of three courses may be pursued: ly steps may be taken to enhance the attraction ervice life; secondly. civilians may be invited ork alongside Service doctors for a prescribed od: and thirdly, by liaison with the National lth Service. civilian doctors may be seconded to Army. At present the first two courses are being owed. In trying to increase the appeal of Service the important factors to be weighed are clinical ources, family accommodation, and pay. Clinical ources are certainly improving, thanks to closer er-Service integration; in several large overseas stations shared by the three Services. medical responsibility has been assigned to the largest user, thus making for bigger medical units and greater clinical experience. The matter of accommodation is particularly important because about half the Army is serving overseas and an unusually high proportion of potential medical officers are married; and here the position has deteriorated. for whereas the large pre-war stations in India, Egypt, and elsewhere had adequate married quarters, the post-war dispositions concentrated on Malaya. Hong-Kong, and the Middle East commonly enforce separation of husband from wife and children. Only the third factor—pay—is what may be termed fluid. The medical "wages' policy" instituted under the National Health Service has underlined deficiencies in other fields; and the universities. research organisations, and other bodies have already attempted to adjust their scales accordingly. Will the Army follow suit? The obstacles are formidable. Within the Army the conferment of greatly preferential terms on doctors might cause much dissatisfaction among highly trained men in other arms of the Service, in much the same way as a recent advertisement for civilian surgeons to work with the Army overseas evoked expressions of disgust from Service specialists engaged at a much lower rate of pay.[1] Moreover, the concurrence of the other two Services would have to be secured; and they might take a quite different view. The Minister of Defence in turn would have to review the claim in the light of his commitment to a share in economy cuts; and finally the Cabinet would adjudicate on the claim against the background of the national financial situation. Yet, notwithstanding these impediments. there is some reason to hope that the scal will be improved. Apart from this, two further facto may soon operate in the Service's favour. The fi is that young doctors may within the next year two be more ready to consider a career in the Arn for, judging by experience after the first world the period of revulsion against military service soon be coming to an end. Secondly, when hos establishments have been finally determined and a number of would-be specialists may turn or however sadly, to the Army. The reluctance at to abandon the competition for places in life is reflected in the result of the advert already mentioned. which asked civilian work with the Army overseas for eight at the rate of £1500–1700 a year plus for allowance. Not a single suitable applican

This unresponsiveness prompts the larg whether the whole approach to the dist doctors between the civilian service and is not too narrow. Were it arranged fo seconded to the Forces for a time wit status in the National Health Service. t tion to go overseas would be largely furthermore, the three medical services were united and were associated wit Medical Service, the promise of cli might be so rich that the chance eagerly seized. At the end of the wa hopes of unification[2]; but so far

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[1] *Brit. med J.* suppl. Oct. 22, p. 185, Oct.

[2] *Lancet*, 1946, ii, 421; *Ibid*, 1947, i, 373

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,se—so-called abortive treatment. Such treat-
was likely to be irregular, haphazard, and
icient; there would be no proper follow-up;
he patient would be indifferent and uncoöpera-
or else seriously overanxious because of the
tainty about infection. In a long experience
el HARRISON had yet to see a case in which the
and-see policy had been disastrous. The argu-
that treatment without diagnosis was bēneficial
public health was equally unsound: the under-
d patient was always a danger, for, though
ce lesions might clear or be suppressed, the risk
fection through the seminal fluid, the placenta,
he menstrual fluid remained. Adequate observa-
and tests of cure were essential in all cases,
ver treated, and it was probably a sound rule
penicillin should not be used for the treatment
nereal disease unless a sure diagnosis had first
made.

the discussion which followed most speakers
d with these views, though some adopted the
of "devil's advocate." Dr. ROBERT LEES, the
lent, thought some latitude must be allowed
there are no laboratory facilities—e.g., with
en at sea and in certain undeveloped countries where venereal diseases are very prevalent. Other exceptions to the rule, which seemed to be generally acceptable, were the case in which a pregnant woman has been exposed to syphilitic infection shortly before term, and the one where the appearances are typically those of gonorrhœa but the gonococcus cannot be found. On the subject of oral penicillin for the treatment of venereal diseases, strong views were expressed and it was even suggested that such treatment should be condemned as a public danger. Reference was also made to the medicolegal difficulties which may arise through abortive treatment or treatment of symptoms and signs without proper diagnosis. The venereologist is unhappily often involved in problems which reach the divorce-court, and the question arises whether the claims of justice can be satisfied on the testimony of a doctor who has given treatment after a risk of infection or because symptoms and signs resembled those of venereal disease.

The evidence and the weight of expert opinion is thus on the side of first principles. "Diagnosis before treatment" is not just one of the quaint sayings of the past, and to disregard it is to incur a serious responsibility which should be accepted only in exceptional circumstances.

Annotations

THE QUEEN IN QUEEN ANNE STREET

FENTEEN years ago, when the Royal College of
tricians and Gynæcologists was only three years
ad was struggling for survival, it received encourage-
from the Queen, who, as Duchess of York, became
st patron. Her Majesty's interest has been main-
d, and at a meeting of the college at 58, Queen
Street, on Nov. 3 she was presented for the honorary
ship by Sir William Fletcher Shaw, a past president,
asked her admission "for all she has done for the
it of British womanhood, for the great example
as given us of domestic happiness, and for her con-
support of this college." Prof. R. W. Johnstone,
r fellow in Scotland, joining in the presenta-
as a fellow countryman, referred to the Queen's
peutic powers: when she visited a hospital she
ited every patient in it—"which is more than any
s can do." Sir William Gilliatt, the president,
g admitted Her Majesty, spoke of her direct help
e college and her indirect help to mothers and
ren through her moral influence. In her reply the
n said: "I share with all my heart your belief
it is on the happiness of home and family life that
rue worth *and strength of a nation depend.*"

e graceful ceremonies ended with the installing of
Hilda Lloyd as the first woman president of one
r Royal Colleges, and of Mr. V. B. Green-Armytage
Mr. J. Eric Stacey as vice-presidents. Then the
n, wearing her new gown of black bordered with blue
silver, took tea with some of the members of the
cil, and inspected the charming but diminutive
ises of the college, to whose general fund she
y made a generous gift.

CLOTHING MAPS

NE of the many urgent questions raised by the late
was how to clothe men who were to be transported
their familiar climate to one of which they, and
those responsible for them, had no experience.
as not enough to issue ducks and topees for the
ics and wool and fur for the Arctic, though such
sures may have sufficed in the more leisurely past, when loss of efficiency was accepted with equanimity. Global warfare demanded *Clothing for Global Man*[1]; as Professor Lee of Johns Hopkins and Dr. Lemons of the U.S. Quartermaster-General's Office put it. Empirical and individual information had to be coördinated and some universal scientific law established from which the clothing requirements for a given situation could be predicted provided some critical physical characteristics of the situation were known. To this end were bent the energies of physicists, physiologists, textile technologists, and geographers. The result of their labours was new maps of the continents, based not on changing national boundaries but on variations in the mean temperature, dividing the earth into eight clothing-allowance and climate zones.

In making the maps many factors had to be taken into account, of which temperature and humidity were the most obvious, followed by wind chill, radiant energy, dust, rain, precipitation, altitude, glare, noxious fauna and flora of all kinds, and so on. The men to be clothed would sometimes be at rest, sometimes working to the limit of their capacity. Incompatibles had to be combined somehow, so that in hot climates the men could keep cool and yet be protected from insects and plants, and in cold climates could keep warm and yet be unimpeded in movement. Both textiles and tailoring were carefully studied; materials had to allow evaporation and yet not retain so much moisture that chilling would occur; clothes must fit well enough for physical and mental comfort and yet not be so close that useful insulating air was expelled from between garments. The standard clothing outfit was taken as that which would maintain thermal equilibrium when the man was "standing around or performing very light tasks" (an hourly expenditure of about 75–90 cal./sq.m./hr). For increased activity garments must be removed and for decreased activity added. Garment units or layers were devised, one garment approximating half a layer, and a standard layer being about $^1/_4$ inch thickness of clothing over the entire body and such that it gave adequate environmental protection, under the conditions prescribed, for each range of temperature of 18°F. Finally, clothing almanacs were compiled which showed by the there was much less difference in antibody content between the cells and the plasma. From this they inferred that lymphocytes could readily part with their antibody; on the other hand, further experiments showed that lymphocytes did not take up antibody when incubated in plasma rich in it.

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[1] Lee, D. H. K., Lemons, H. *Geograph. Rev.* 1949, 39, 181.

On general grounds, antibody formation might be regarded as a form of secretion—a process which usually requires a cell with a fair quantity of cytoplasm. But the small lymphocyte possesses very little cytoplasm, and by analogy with other secretory cells would not appear to be structurally suited for antibody formation. It is all the more interesting, then, that the view has been gaining ground that a cell with rather more cytoplasm, the plasma cell, is the chief source of antibody. Last year, FAGRAEUS[17] reported that the administration of antigens was a powerful stimulus to the multiplication of plasma cells, which in turn were derived from reticulum cells. This was particularly noticeable in the splenic pulp, where first of all large numbers of immature plasma cells appeared, and then as the titre curve of antibody levelled off these became transformed into mature plasma cells. In-vitro studies of splenic tissue showed that very much more antibody was present in the red pulp than in the lymphoid follicles, while the capacity of the red pulp to form antibodies seemed to be directly related to its content of immature plasma cells. A correlation was also established between the formation of antibody globulin and histochemichal changes in the plasma cells—namely, cytoplasmic basophilia and increased ribonucleotides. It is worth noting in this connexion that DOUGHERTY and WHITE[8] had reported an increased formation of immature plasma cells in the lymphoid tissue of rabbits within a few hours after the injection of cortical hormones. At the same time they had observed increased basophilia in the cytoplasm of many of the smaller lymphocytes, which on superficial examination apparently resembled plasma cells. Lately, EHRICH and others,[18] studying the cellular changes in the popliteal lymph-gland after injection of typhoid bacilli into the pad of the foot, found that the period of maximal antibody formation at 4–6 days after the injection was associated with an increase in ribonucleic acid in the cells. The cellular reaction at this time was mainly of plasma cells, which they decided were formed from specific plasmoblasts and not from lymphocytes. They finally concluded that it was the plasma cell and not the lymphocyte which was responsible for antibody formation. HARRIS and HARRIS,[19] however, performed similar experiments—again in rabbits, but using different antigens (dysentery bacilli, influenza irus, sheep erythrocytes)—and reported an increase, ot of plasma cells but of lymphocytes rich in riboucleic acid. It is difficult to reconcile their experients with those of EHRICH and his colleagues, unless e assumes a differential response of the lymphocyte different antigens. It seems clear too that the er histochemical methods are reviving the old troversy concerning the origin of plasma cells— they formed from lymphocytes, or from a specific ursor, the plasmoblast?

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graeus, A. *Acta med. scand.* 1948, suppl. 204.

rich, W. E., Drabkin, D. L., Forman, C. *J. exp. med.* 1949, 157.

rris, T. N., Harris, S. *Ibid*, p. 169.

Abortive Treatment of Venereal

THE aphorism "diagnosis before treatment" a fundamental principle of medical practice on all sound teachers have laid stress. Does this ciple admit of exceptions? Are there circumstances, affecting the patient or the health, which justify treatment for disease may not be present? It has been widel with some dissentients, that the venereal exceptions, and that some forms of treatment are desirable where patients have endangered by promiscuous intercourse[1] tration of effective antibiotics is so easy and safe practitioners must be sorely tempted to give patients who are worried and distressed. et al.[2] and PLOTKE et al.[3] have shown incidence of early syphilis among people sexually to infectious early syphilis can be diminished by single injections of 0·6–0·9 of procaine penicillin; and this experimental has so convinced medical opinion in the U that abortive treatment for syphilis is now practice there.

When the pros and cons of abortive treatment discussed by the Medical Society for the Venereal Diseases on Oct. 29, Colonel L. W. spoke of the increase of "sulphonamide gonorrhœa during the war, when sulph became available for self-treatment, through agency of seamen and Allies, and were given in therapeutic doses by many practitioners. The wholesale and haphazard use of penicillin filled him fear for the future, and he thought the use of by mouth for prophylaxis was particularly because of irregular absorption, haphazard dosage half-hearted treatment. The prevailing practice of ing, without proper diagnosis, lesions and which might or might not be due to syp gonorrhœa was to be condemned: after such ment correct diagnosis was either impossible or delayed: and the resulting uncertainty was disastrous to the patient's state of mind, making a candidate for syphilophobia. If the tre appeared to be successful it was likely that patient would never be seen by a specialist and have no proper observation and tests after Colonel HARRISON referred to the obvious masking the effects of early syphilis and the bility that the incidence of late serious manifest affecting the central nervous and vascular systems increase. With older remedies, such as the it had been shown that under-treatment was to increase the risk of neurological mani syphilis; and though many had claimed the forms of relapse which affected the nervo system were rare after treatment with penicillin was still too early to accept this conclusion and end-results remained to be determined. All the arguments against the treatment for symptoms and signs without accurate diagnosis applied equally, Colonel HARRISON's opinion, to treatment of pe who had taken a risk but had no manifestations

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1. Annotation, *Lancet*, 1949, i, 1014.
2. Alexander, L. J., Schoch, A. G., Mantooth, W. B *Am Syph. Gon. ven. Dis.* 1949, 33, 429.
3. See Leading Article, *Lancet*, 1949, i, 1009.

; gave high titres of serum-neutralisation in eggs, and 20 pairs of sera showed a fourfold or greater rise in ıæmagglutination properties to N.D.V. during the se of convalescence. In contrast, only 3 of the control gave high titres of neutralisation to N.D.V. and none 'ed a rise in antihæmagglutinating factors against virus. In the 5 cases of meningo-encephalitis where spinal fluid was examined for N.D.V. the virus could be isolated.

ıese results are against the view that Newcastle ıse virus is widely concerned in human disease. logical results with this virus obviously require ious interpretation, and apparent neutralisation of virus in vitro may be due to some property of the n other than specific antiviral antibody. Another bility is that mumps and N.D.V. share some common gen, and several years ago Burnet and his associates [7] hasised the biological closeness of N.D.V. to mumps the influenza viruses in virtue of the effects of their ral agglutinins on human red cells. It is clear that infections will often be very difficult to differentiate s the actual viruses can be isolated.

STANDARD HOSPITAL COTS

ɪᴇ British Standards Institution have drawn up a dard specification for children's cots in hospitals. differs from what is customary chiefly in that the es between the vertical bars, or "filling tubes," are ced to 3 in. (or 3$^{1}/_{4}$ in. in specially wide cots). Most ıe present cots have a spacing of 4 in., which until has seemed reasonably safe; but many have a wider of 4$^{1}/_{2}$–5 in. at each corner, where one of the bars ent at a right-angle to form a stop that limits the award movement of the dropside. It was in such a hat a baby fatally dislocated his neck by squeezing etween the bars some months ago.[8] When the new are in use, the elimination of the potentially dan- us gap and the closer spacing should make this icular accident impossible, and in the meantime ital management committees will no doubt act the Minister's request to reconstruct any of the style cots they have in their wards.

vo years ago Napier [9] pointed out that the dropside often unnecessary, and he contended that its removal e for safety, reduction of noise, and the conservation urses' time and energy. He favoured a fixed side e 6 in. high for babies who are beginning to sit up would therefore be unsafe in an open cot. In line this argument, the B.S.I. proposes that, where an rmediate position for the dropsides is required, extra ets to support them shall be fitted 10 in. above the l of the wire mattress. This halfway position is to commended, for in suitable cases it will allow most sing procedures to be done without moving the side. But often it will still be necessary to raise lower the sides of cots to their full extent, and ier showed that in this way the nurses in a single d may have to lift nearly a ton of metal in 24 hours. seems to be a good reason for making dropsides of e light alloy instead of steel; and it would make for ce and quiet in hospital wards if rubber facings e attached wherever metal comes against metal. ses will rejoice that in the new cots the dropside go right down and swing inwards when lowered. things are it often does neither, and gets in the way he nurse's feet as well as her hands during bedmaking. type of safety-catch to be fitted is not specified. ingenuity of manufacturers will be taxed in devising atch easily and quickly released by the nurse and proof against the young patient's urge to undo it.

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urnet, F. M., McCrea, J. F., Stone, J. D. *Brit. J. exp. Path.* 1946, 27, 228.

ancet, 1949, i, 1029.

apier, W. *Ibid*, 1947, ii, 578.

THE CHARGE FOR PRESCRIPTIONS

DESPITE growing opposition the Government have apparently decided to proceed with their plan for charging up to a shilling for National Health Service prescriptions. The question is whether this charge will really achieve any material saving of money or of professional time. Some hold that the time it does save will be won at the cost of discouraging early resort to medical advice. Thus the council of the Pharmaceutical Society have told the Prime Minister that—on the basis of pharmacists' experience in dispensing National Health Service prescriptions—they are satisfied that the charge will not deter those who are misusing the service to a serious extent. They think that "the charge will be prejudicial to the use of the service by persons who need medical attention but will not reduce excessive and unnecessary resort to doctors and chemists by those who are least deserving of the benefits they are receiving." On the other hand, this may well be an unduly pessimistic view; and the Government, accused of timidity in their economy measures, will naturally be unwilling to drop one which in principle enjoys a good deal of support.

The only group for whom the Prime Minister suggested a special exception were the old-age pensioners. Since his statement similar special consideration has been claimed for many other groups, including children, students, widows, and those who are ill for a long time. The exemption of these groups would not be impossible, though it would present varying degrees of administrative difficulty. Actually it is the difficulty of collecting the tax that is now so widely pleaded as a reason for its abandonment. No more can usefully be said until we hear the Government's proposals in detail.

EDUCATION FOR HEALTH

Lord Woolton welcomed representatives from many countries and professions to the two-day conference which the Central Council for Health Education held in London this week. He gave "a public buzz to a bee that is constantly in my bonnet" in an adroit and convincing plea for instruction of the ordinary man in what he should eat to keep healthy. Prof. W. O. Lester Smith asked for closer liaison between education and health services. Prof. Andrew Topping, F.R.C.P., declared that we must debunk the idea, for which doctors bear a share of the blame, that the less the layman knows about the causes of disease the better for his peace of mind. Frank discussion with inquiring patients was more time-consuming than an arbitrary diagnosis and a scribbled prescription, but the latter did nothing to help the patient to avoid sinning against the rules of health. Dr. Topping deplored the prudery which hindered effective publicity on the mode of spread of food-poisoning; even if in her day Queen Anne was not admitted to have legs, surely it was now realised that everyone had a large bowel. Dr. Melville Mackenzie said that we had much to give and also much to receive in matters of health education; he emphasised the value of international organisations, and especially W.H.O. Prof. R. H. Parry held that the ordinary man, who wanted to know how to look after "his only real estate—his own body and mind," needed a sound knowledge of elementary biology, the capabilities of his own body, and how to use his own reason, with an occasional word of advice on personal problems. An exhibition of films, filmstrips, and models was held in connexion with the meeting.

Sir HORACE EVANS, K.C.V.O., F.R.C.P., and Dr. DANIEL T. DAVIES, C.V.O., F.R.C.P., have been appointed physicians to the King.

Dr. O. C. CARTER has been elected to the General Medical Council as a direct representative for England.

use of double-entry tables, item by item and month by month, the clothing requirements of a specific "clothing almanac region." Psychology was not forgotten and social customs and fashions were taken into account.

Many difficulties faced the investigators, from the entire absence of scientific data for some parts of the world, and inadequate data for others, to the problem of reducing to mathematical terms the effect of clothing on heat-loss from a body as awkwardly shaped as man. They seem to have achieved a great deal in a new field, though much remains to be done. We have come a long way from the belief that only a woollen cummerbund can stave off death in the tropics.

"CONVERGING PROGRESS" IN WESTERN UNION

ON Oct. 29 we described the efforts now being made to bring the social services of the Western Union countries into closer relation with one another. The five Powers of the Brussels Treaty (France, Belgium, Luxembourg, the Netherlands, and the United Kingdom) are negotiating bilateral agreements which will link their social-security schemes into a network covering such benefits as those provided for sickness, invalidity, old age, death, maternity, industrial injuries, and prescribed occupational diseases, for their nationals, no matter in which of the countries they may be living, or have lived. The five Powers have now signed a multilateral convention, which will enable a national of any of the five countries to benefit from any of these bilateral agreements. A second convention, also signed, is based on the principle that if a national of any of the five countries, when resident in the territory of any of the other four, needs social or medical assistance, but is without sufficient resources, he shall receive such assistance from the latter country on the same basis as its own nationals. For example, an Englishman living in Holland, who is without sufficient resources, will receive the same free hospital treatment as a Dutchman in similar circumstances; or a Frenchman, living in Belgium, who is too old to earn his keep, will receive the same assistance as a Belgian in the same situation. The five countries will not reimburse each other for the cost of such assistance.

Repatriation solely on the ground that assistance is likely to be long-continued or costly is not to be resorted to if the person concerned has, for instance, close family ties in the foreign country in which he is living or has resided there for more than five years (ten years if he entered that country after the age of 55) or is not in a fit state to be transported.

THE SMALLER HOSPITAL

REORGANISATION is a thankless task for the reorganisers; while to the reorganised it is generally anathema. It would be irresponsible, in those who have no first-hand experience of the difficulties, to protest at every step the regional hospital boards take in their efforts to rationalise the hospital services; but it would be equally wrong to withhold criticism when some important principle seems to be set aside. This week two of our correspondents put the arguments for maintaining the identity of the smaller hospitals: Mr. Michael Harmer for a particular case, Dr. Annis Gillie for such hospitals in general.

When a service is adequately covered by the large hospitals of an area, it must be exceedingly tempting to revise the purpose of smaller hospitals which duplicate it. But, quite apart from possible destruction of valuable traditions, can we be sure that action of this kind is on the right line of evolution? There are several authorities on hospital development, who believe that in course of time we shall see a return to small hospitals, for the very reason which Dr. Gillie outlines. It matters to the patient, if to nobody else, that should be seen by the same doctor each time he Dr. J. M. Lipscomb[1] has well described the fate of patient bandied between consultants, first assi a dissolving panorama of house-physicians, until began as an innocent and easily removable becomes a malignant neurosis with secondaries where. In the small hospital continuous care by doctor, or a small group of doctors, is the rule the exception; whereas in the large general hospital is the exception rather than the rule. It is also to the patient to meet the same outpatient sister same small band of fellow patients; it is even to become known to the same hospital porter. T things make for the security on which recovery health so often depend. Moreover there are questi time and distance: the small hospital round the is used more willingly than the large one a bus away.

Is it too late for hospital boards to reconsider policy? Is it not possible that they are moving in wrong direction? It may well be wise to equipment in large centres; but does this oblige us concentrate people too?

NEWCASTLE VIRUS DISEASE IN MAN

THE virus of a common disease of domestic first isolated in 1927 by Doyle in Newcastle and known as Newcastle disease, has until lately regarded as an uncommon human pathogen. before 1948 the only known examples of human infe were sporadic cases of conjunctivitis either in labo workers or in people handling poultry; in further of this kind reported in the U.S.A. this year,[2,3] virus has been recovered from washings or from the conjunctiva. But in 1948 Howitt and investigating a febrile disorder accompanied by encephalitis, occurring in epidemic fashion in Te and Alabama, found that the convalescent sera from patients neutralised Newcastle disease virus (N.D.V.) a high titre when mixtures of virus and serum inoculated into fertile hens' eggs. They concluded widespread infection by the fowl virus did occur at in man, though they did not prove their point by rec ing virus from human specimens, nor did the picture of their cases resemble that previously recorded in laboratory infections of the eye by the virus. by this report, Jungherr and others[5] have investi similar cases of a mild meningo-encephalitis, and have also studied serum samples from mumps pa Unexpectedly, the convalescent mumps sera were ones which neutralised N.D.V. strongly, whereas the from the meningo-encephalitis cases had either a or no neutralising capacity for this virus. In a report[6] these workers give more detail of this inv tion. Sera from 22 cases of clinically typical yielding mumps virus in 11 instances by direct test, examined with both mumps and N.D.V. anti Complement-fixation and agglutination-inhibition showed the expected rises in antibody to mumps during convalescence. Sera from 14 control cases meningo-encephalitis and from 7 cases of nonparalyti poliomyelitis did not show evidence of mumps infectio by the agglutination-inhibition or complement-fixatio tests. When examined against N.D.V., 13 of the 22 mump

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1. *Lancet*, Sept. 17, p. 495.
2. Freymann, M. W., Bang, F. B. *Bull. Johns Hopk. Hosp.* 194 84, 409.
3. Ingalls, W. L., Mahoney, A. *Amer. J. publ. Hlth*, 1949, 39, 7
4. Howitt, B. F., Bishop, L. K., Kissling, R. E. *Ibid*, 1948, 38, 1
5. Jungherr, E., Luginbuhl, R. E., Kilham, L. *Science*, 1949, 11 333.
6. Kilham, L., Jungherr, E., Luginbuhl, R. E. *J. Immunol.* 194 63, 37.

absent from school on May 25, 27, and 28 with a ned ankle.

ough the relations between the R. and N. families again described by both parties as unfriendly, fresh ry revealed that the school-girl E.N. often acted "baby-sitter" while Mr. and Mrs. R. went to the na, and that she was accustomed on such occasions ed the baby (B.R.)—without, however, changing apkins. Her parents were uncoöperative during the quent investigations, which revealed that the er (Mrs. N.) and another child (M.N.) were infected S. *paratyphi B*. Both had been quite symptomless remained so after their admission to hospital on 5 and 7. Mrs. N. was breast-feeding an eight-h-old baby, who was permitted to accompany o hospital and remained uninfected throughout its there.

further cases of paratyphoid infection were vered after these.

CLINICAL COURSE

the 13 persons involved, 3 adults (Mrs. R., Mrs. S., Y.) had severe attacks of paratyphoid, with fever g 23, 24, and 19 days from the onset. One of these R.) said she had been inoculated with T.A.B. ally from 1941 to 1944 during service in the A.T.S. reference to her Army pay-book confirmed this. was three months pregnant and during her illness spontaneous and complete abortion. None of the s had ever had T.A.B., except possibly Mr. M. during ce in France in 1914–18. One adult had a mild attack very little toxæmia, and 2 children had short sharp ks of diarrhœa, lasting for two and seven days.

e remaining 7 persons (3 adults, 4 children) did not t sick at any time. One of these (E.N.) was the only in the series from whom the organism was not ted. Her serum agglutinated paratyphoid B(H) en only and to the following titres: 1/320 on 3; 1/50 on June 17; and 1/125 on June 21. These ngs support the view that she had been recently ted. She had never had T.A.B. inoculations. A later her stools and urine are still repeatedly tive, but her Widal for paratyphoid B(H) is positive).

ere were no deaths. Of the 3 patients who were ely ill 2 had signs of myocardial weakness but made d recovery, and all were quite well a year later.

CLEARANCE OF INFECTION

e standard adopted for release from isolation was gative result from six consecutive specimens of and urine taken half-weekly. As already stated, *ratyphi B* was never recovered from 1 of the hospital nts. Of the other 9, 8 ceased to excrete the aisms after periods varying from six to forty days, so did the 2 children who were isolated at home.

e man who was not admitted to hospital (Mr. R.) in another town, and after the initial positive urine t on April 23, only one further report was available—s and urine both negative on May 21. His blood ed the same agglutination findings on May 12 and 26—namely, paratyphoid B(H) positive 1/50. We anxious about him because it was difficult to imagine taking appropriate care to prevent spread; but no her cases have been attributed to him.

PERSISTENT CARRIER STATE

he remaining case (Mrs. N.), who had no symptoms, inued to excrete *S. paratyphi B* in both fæces and e during the sixteen weeks she spent in hospital. was breast-feeding a healthy infant throughout and child did not become infected nor has it done so since. ear later, Mrs. N. is still a persistent fæcal and urinary carrier. Another one of her children has recently (September, 1949) been found to be infected (fæces positive for phage-type IIIA and Widal paratyphoid B(H) 1/450) without having had any sign of illness. Incidentally in June, 1949, this child's fæces contained *S. typhi-murium*.

EPIDEMIOLOGY

We thought at first that the 5 earliest cases discovered had their origin in Mr. R. (senior), who had apparently been quite well but was excreting *S. paratyphi B* in his urine. He had lived alone in the district for many years, but his son had only recently set up house with his wife and child near his father. For the first time in recent years the grandfather had the opportunity of visiting them *frequently*, bringing various delicacies for the baby. The old man may have been the starting-point of the series, but we have no evidence to show whether he remained a carrier subsequently.

The middle-aged man (Mr. M.) rapidly became a non-excreter of the organism and it is improbable that he was a carrier. He was almost certainly infected by one of the R. family.

When the school cook was found to be infected we could not, by any analysis of evidence—contact, food, food-suppliers—link her with the R. family. We thought it most unlikely that two independent foci of infection (by organisms of the same phage type) should appear almost simultaneously, but we could not trace the connexion between them.

Notification of the schoolgirl E.Y. was regarded at the time as the prelude to a major outbreak. We thought she would prove to be one of many infected by the cook. However, time passed without bringing any further cases. It was the repeated questioning of E.Y. that eventually revealed a connexion with the original house through her classmate E.N. We realised that we had been deceived in regard to the relation between the two families there, and had not been sufficiently alive to the need for bacteriological and serological testing of the family in the upper flat. We now believe the mother of this family (Mrs. N.) to have been the origin of the series. She is the only proved "carrier" in the series. She is a chronic carrier now and probably was then. (It is true that she had worked in canteens off and on until rather more than a year previously without any cases of paratyphoid having been attributed to her.) We suppose her daughter (E.N.) to have been infected by her and to have passed the infection to the first case in family R., to the first case in family Y., and possibly even to the cook.

It is most improbable that the cook, if she infected anyone through the school meals, would have infected only 2 out of 260 pupils. At this school, girls in the senior forms were permitted to visit the kitchen on various errands, but junior girls (such as E.Y. and E.N.) had very little opportunity for doing so. In spite of this it is suggested that somehow the infection reached the cook from E.N. This theory is the one that most nearly fits the facts, even if it does postulate, for the spread of infection between diner and cook, a reversal of the more usual direction.

We have not discussed the various administrative measures involved, such as correspondence with doctors and action under the Public Health (Infectious Diseases) Regulations, 1927, because it is the chain of infection we regard as chiefly interesting, and also the absence of symptoms in 7 out of 13 persons involved. We think that, besides bacteriological investigation, repeated Widal examinations would have been useful for distinguishing the chronic carriers from recent symptomless infection. We recognise that, had we perhaps been a little more prescient, case E.N. might never have caused infection in the later cases as we believe she did.

Public Health

A SMALL OUTBREAK OF PARATYPHOID FEVER

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DEWSBURY

After several years' freedom from paratyphoid, Dewsbury, a town of some 52,000 inhabitants and the centre of the heavy woollen district, experienced a small outbreak in the second quarter of 1948. Of the 13 persons known to be affected, 12 resided in the town and 1 in an adjoining borough. In 12 cases *Salmonella paratyphi B* was isolated from one or more of three sources—blood, fæces, or urine. In the 13th case the diagnosis was based on positive Widal reactions. The organism was proved in 11 cases to belong to phage-type IIIA, but in the other case was unfortunately not typed.

SEQUENCE OF EVENTS

The first 3 cases, notified on April 16, were those of a boy aged sixteen months and his parents in their middle twenties. The child (B.R.) had had diarrhœa for a week from March 30 but had recovered. The father (Mr. R. junior) had had symptoms beginning a week after those of the baby; and four days later the mother (Mrs. R.) had sickened with diarrhœa and headache, a severe classical attack of paratyphoid ensuing. The 3 cases were notified when the family doctor learned that *S. paratyphi B* had been isolated from fæces taken from the mother on April 12.

On visiting the family's basement flat it was found to be empty. The mother, who was really ill, had been removed by taxi two days previously to her father's house ten miles away, where another doctor had been consulted and had sent her into a general hospital, as a suspect enteric case, on April 16, the very day on which she was notified in Dewsbury. She was transferred to Dewsbury Isolation Hospital that evening. The father (Mr. R. junior) and baby (B.R.) were traced to another part of Dewsbury, where they were staying with some friends, a middle-aged childless couple, and were forthwith removed to hospital. Their hosts, Mr. and Mrs. M., were both well, but Mr. M. was found to be infected (fæces positive) and he was admitted to hospital on April 21.

The baby's paternal grandfather (Mr. R. senior), who lived in an adjoining borough, was also found to be infected. He appeared to be quite well, but *S. paratyphi B* was isolated from his urine taken on April 23, the fæces being negative. Unfortunately this (his only positive) sample was not phage-typed. He had no symptoms and was not admitted to hospital. He was not helpful, and it proved impossible to get a connected story from him.

Routine inquiries showed that in the same house as the original cases there was another family (N.), all of whom were well, living in the ground-floor flat with a separate water-closet. There was a communicating door between the two parts of the house, but the two families were said to be unfriendly and not on visiting terms.

So far, all 5 persons known to be infected were close contacts of one another. Mrs. R. left her child to be minded, during working hours, by Mrs. M., who provided them both with a midday meal, and quite regularly had Mr. R. junior as a visitor. Mr. R. senior frequently visited his son's home, bringing sweets and cakes for his grandchild, and was in turn visited by them. A careful investigation was made of food eaten and of food-suppliers concerned; but the only interesting finding was of *S. anatum* in dried egg consumed by family.

EXTENSION OF OUTBREAK

At this stage it was hoped that the outbreak remain confined to the family circle of these 5 but on May 1 a fresh case was notified. The (Mrs. S.) who lived in an entirely different part of bury, had been admitted to a local general hospital days before and was now transferred to the isolation pital on a clinical diagnosis of paratyphoid, confirmed. She had not appeared well since and had complained of headache on the 21st; had continued to work until the afternoon of the Some anxiety was felt when her occupation was closed, for she was the cook at a day school for attended by some 320 pupils, of whom 80% took at school. Fortunately she had a high standard of hygiene, and also did not suffer from diarrhœa two days after she stopped working.

SCHOOL CONTACTS

For the next few weeks everybody attending was supervised by the staff of the health department. absentees and those complaining of any form of during the period beginning on April 12 were up—at first daily, and later at short intervals—and was continued until July 14. Bacteriological tions were made in all cases of illness which were remotely suggestive of enteric. We decided offer mass T.A.B. inoculation to the school-children staff, because in theory the first crop of secondary was already imminent. Some children, however, inoculated by their own doctors, who had been informed of the course of events.

A surprisingly large number of the children transient headache and diarrhœa, and 35 children 5 staff were investigated bacteriologically. these, 3 cases of salmonella infection were dis (1 of *S. enteritidis*, 1 of *S. typhi-murium*, and *S. paratyphi B*).

About this time cases of paratyphoid were reported Horbury, a neighbouring sanitary district. As one cases had associations with that town we were end to trace any connexion, when Dr. W. G. Evans informed us that his cases belonged to phage-type I, proved that the two series were unconnected.

FURTHER CASES

The child at the school who was found to harbouring *S. paratyphi B* was a girl of 13 (E.Y.). W admitted to hospital on a bacteriological finding (fæ positive) on May 12 she was quite well, but had been under her own doctor's care for a attack of diarrhœa which started on May 1 cleared up in two days. When her home was visi arrange for her admission to hospital, her father (was found to be in bed suffering from "lumba He was admitted to hospital at once with a c diagnosis of paratyphoid, later confirmed.

Further investigation of this family revealed 2 other children, M.Y. aged five and A.Y. aged were infected (fæces positive); but they had had symptoms, and they did not become ill. They isolated at home under strict supervision.

At this stage T.A.B. inoculation was offered to one in the school, and 77 persons were inoculated

Almost casually, after E.Y. had been in hospital weeks, she revealed that she had been given "sh powder by a classmate (E.N.), who was one of family of 6 living in flat above the original Accordingly the N. family was at once reconsi The child (E.N.) was found to have a positive Widal was admitted to hospital on June 4. She was and denied having had any symptoms, though she kerby. As was to be expected from so eminent oup, the questions to the speakers were very much ie point. There seems to be general agreement that meeting has done much to dispel some of the ls of misunderstanding circulating around the onal Health Service. Even the disagreements between British speakers were valuable to the huge and deeply ested American audience.

ie wide interests of the American Public Health ciation are well shown by the distribution of the ter awards for 1949. They include a special award r. Haven Emerson "for developing a programme for plete local health service in every area of the United es" (this award was received with prolonged imation); to Dr. Andre Cournand, of Columbia ersity, for his contribution to the physiology of the dation in man and the diagnosis and treatment of t-disease; to Miss Marian Sheahan for distinguished ership in the field of nursing and public health: r. Max Theiler, of the Rockefeller Foundation, for xperimental work leading directly to the production wo effective vaccines against yellow fever; to Dr. iam S. Tillett and Dr. L. R. Christensen, of New University, jointly, for their discovery and purifica- of streptokinase and streptodornase: and finally, r. Edward C. Kendall and Dr. Philip S. Hench, of Mayo Clinic, for their studies on 'Cortisone.' Group rds were given to the American Academy of Pedia- in recognition of the public-health significance of its on-wide study on child-health services and pædiatric ation and to the Life Insurance Medical Research d for "initiative and support of programmes of research the main cause of death, cardiovascular disease."

he exhibits, both technical and scientific, were of standard. The latter included exhibits by Federal State health and welfare departments. The Canadian ernment exhibit featured, inter alia, the first year of a year government health programme "illustrating foundation now laid for adequate and strategic pital facilities and the nation-wide advances in lic health and professional training promoted by ernment grants." (It seems a pity that Great tain, with such constructive efforts to demonstrate, no exhibit.) Among the technical exhibits were al aids to posture known as "Posture Pete" and impy Lou"—characters not unknown in central and l government offices in Great Britain.

nce acclimatised to the magnitude of this annual eting, the observer was increasingly impressed by smoothness with which it was conducted. This largely due to the genial enthusiasm of the president, Charles F. Wilinsky, and to the competence of the cutive secretary, Dr. Reginald Atwater.

TUBERCULOSIS IN NORTHERN IRELAND

ame Dehra Parker, minister of health and local govern- nt, has lately announced in the Northern Ireland Parlia- nt that within six or eight months the Tuberculosis hority hopes to have an additional 200 beds for patients h tuberculosis, including 116 for children. The minister ed that 1381 patients with tuberculosis were undergoing pital treatment, and that the number awaiting admission 625. In suitable cases the use of sleeping shelters in the nes of patients was being encouraged.

n the annual report of the Tuberculosis Authority, the ector of tuberculosis services emphasises the importance ealth visiting:

> "The solution to the tuberculosis problem is not revealed y the stethoscope nor by shadows on an X-ray film. It lies in he homes of the people. Whatever curative drug may be dis- overed, the ultimate eradication of the disease will depend pon our ability to obtain the coöperation of the people. . . . he reception which a patient receives when first visiting a uberculosis clinic may make all the difference to that patient's uture coöperation and peace of mind. It is no light matter to ttend at the clinic for the first time and await a verdict which ay jeopardize one's whole future, not only as regards employ- ent, but as regards home life as well. From the lips of many atients one learns how much their reception by a kind and actful health visitor has helped in the struggle ahead."

Disabilities

42. POSTGASTRECTOMY (DUMPING) SYNDROME

The expression "dumping syndrome" is neither elegant nor descriptive, but I cannot think of any really appropriate name for the symptoms that a considerable proportion of people get after a partial gastrectomy.

I had my partial gastrectomy a little more than three years ago, at the age of 59. I had had a chronic gastric ulcer for three years, and, owing to pressure of work during the war years, it had been very perfunctorily treated. Finally, owing to persistent evening vomiting from a delayed gastric emptying time operation was advised and willingly accepted. About two-thirds of my stomach was removed, and a Hofmeister-Polya-Lake anastomosis was done. My convalescence was not altogether uneventful. I had collapse of both lung bases, the wound went septic, a duodenal fistula developed, and I had a thrombosis in the right calf. The abdominal incision did not finally heal until four months after the operation. However, once the coughing due to the lung condition was over and the wound was no longer acutely inflamed, convalescence was almost a pleasant rest. The only odd thing was that about three weeks after the operation, in the middle of the morning, just after taking a glass of milk, I had quite suddenly an extraordinary feeling of extreme exhaustion. This recurred three times in all while I was in hospital, always in the mid-morning after taking a glass of milk. Between sister and myself the attacks were called "flops," for want of anything more descriptive. Only much later, after many such attacks, is it possible to give a really detailed account of the rather complex sequence of sensations.[1]

The symptoms are always the same. The first thing one notices is a consciousness of the action of the heart: it isn't exactly palpitation but is a most peculiar and unpleasant sensation. In really bad attacks it feels as if the heart occupied the whole of the thorax, yet there is no throbbing in the neck vessels, and the cardiac impulse cannot be felt. The rate is only slightly increased to about 90 per minute, my average pulse-rate being about 70, and there is no irregularity. Blood-pressure remains unaltered. There is no flushing or sweating and no change in colour. Simultaneous with this symptom there is a curious sinking feeling in the abdomen, perhaps rather similar to that induced by fear, &c. Lastly, there is a feeling of extreme exhaustion, so that one is compelled to lie back and shut one's eyes, not because one wants to sleep but because it seems impossible to be actively interested in anything or to move. After a time the unpleasant cardiac sensation slowly disappears and then I feel perfectly normal, though perhaps still a little tired. The attacks may be mild and just a slight nuisance, intermediate, or severe, and in a severe one I don't think I could make myself do anything. Perhaps the whole attack, whatever its severity, lasts about half an hour from start to finish.

I had no more attacks until I was fully recovered and up and about all day, when they started again. At this time they always started after breakfast. Exercise immediately after a meal, or even just standing still, seemed to bring on an attack, and I found a short period of complete rest after every meal advisable. After a few months the attacks ceased after breakfast and would come on after some other meal. The odd thing is that, having changed their timing, the attacks tend to come on only after one meal of the day for a period, and then *quite suddenly* switch to another meal. At the moment it is the evening meal. How much or what I eat seems to make no difference to their incidence, and so far I have been unable to find any régime that will influence

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[1] A preliminary account of my symptoms was published two years ago in a letter signed "M.D." (*Lancet*, 1947, ii, 596.)

Consideration of the Public Health (Infectious Diseases) Regulations 1927 leads us to suggest that they should be amended in at least two ways :

(1) The medical officer of health should have immediate suspensory powers in respect of *cases* and *carriers* of dysentery, typhoid, paratyphoid, and food-poisoning occupied in a trade or business concerned with the preparation or handling of food.

(2) The authority should have powers to require, until revocation of the notice, known carriers of these diseases to abstain from any occupation concerned with the preparation or handling of food or drink intended for sale for human consumption whether then engaged in such an occupation or not.

It would be interesting to know how often *known* carriers are responsible for the spread of these diseases, either explosively or insidiously.

Our thanks are due to Dr. J. C. Colbeck, late director of the Public Health Laboratory, Wakefield, and Dr. W. F. Lane, the present director, who did the bacteriological work ; to Dr. A. Felix, F.R.S., of the Central Enteric Reference Laboratory, London, who was responsible for the phage-typing of the organisms ; and to the sanitary inspectors, school nurses, health visitors, teachers, and others who took part in the investigation.

Smallpox Vaccination in Argentina

At the beginning of September, some forty cases of smallpox were reported in Argentina, mostly among immigrants. Since then, according to B.U.P., the whole population of 16 million has been vaccinated. The government ruled that vaccination certificates dated not earlier than Sept. 1 must be presented at theatre and cinema box-offices before tickets could be sold : and a similar condition was applied to the sale of railway, air, and shipping tickets.

Poliomyelitis

In the week ended Oct. 29 notifications were : poliomyelitis 347 (385), polioencephalitis 20 (29). Figures for the previous week are shown in parentheses. This is the second week in which notifications have fallen, and it is hoped that the usual seasonal decline has now definitely begun. The distribution of the disease is widespread as is shown by the following list of counties in which multiple cases were reported :

London 55 (66), Bedford 2 (3), Berkshire 3 (6), Buckingham 4 (1), Chester 10 (8), Cumberland 2 (2), Derby 2 (5), Devon 3 (0), Dorset 3 (3), Durham 2 (3), Essex 26 (32), Gloucester 9 (12), Hereford 2 (0), Hertford 9 (6), Kent 16 (26), Lancaster 32 (25), Leicester 3 (13), Lincs, Lindsey 13 (7), Middlesex 17 (19), Norfolk 5 (8), Northumberland 2 (9), Nottingham 8 (9), Oxford 2 (1), Rutland 2 (1), Somerset 11 (10), Southampton 13 (13), Stafford 3 (12), Suffolk, East 2 (1), Surrey 14 (16), Sussex, East 9 (2), Sussex, West 3 (2), Warwick 8 (9), Yorks, East Riding 2 (3), Yorks, North Riding 2 (3), Yorks, West Riding 50 (47), Glamorgan 7 (6).

Infectious Diseases in England and Wales

Disease	Week ended Oct.				
	1	8	15	22	29*
Cerebrospinal fever	25	37	29	24	26
Diphtheria	76	84	85	92	101
Dysentery	163	290	179	154	139
Encephalitis lethargica	1	1	..	2	1
Food-poisoning	553	121	96	88	130
Measles, excluding rubella	780	926	997	1052	995
Ophthalmia neonatorum	39	31	43	68	39
Paratyphoid fever	24	18	13	18	14
Pneumonia, primary or influenzal	313	312	354	317	303
Polioencephalitis	26	34	45	29	20
Poliomyelitis	332	341	418	385	347
Puerperal pyrexia	104	114	108	81	72
Relapsing fever	..	..	1	..	..
Scarlet fever	1305	1624	1844	1909	1972
Smallpox	..	..	..	..	..
Typhoid fever	12	18	14	6	7
Whooping-cough	956	908	875	831	749

* Unrevised figures.

Special Articles

AMERICAN PUBLIC HEALTH ASSOCIA

FROM A CORRESPONDENT

THE first impression of the annual meeting of American Public Health Association in New York one of unwieldiness. The programme showed principal speakers spread over 108 sessions in five day a meal too large for even the most enthusiasti and it was not until the meeting was well under way the careful organisation of the thirteen sections bec clear.

Seventy-seven years ago 10 men met for the annual meeting. When this one opened on Oct. 4500 people had registered, and a total of well 5000 have been present.

At the first general session, addresses of welcome given by the Mayor of New York City (the Hon. Will O'Dwyer), and the Commissioners of the New City and State departments of health. The Hon. Martin, minister of public health and welfare for Dominion of Canada, gave an address which mad clear that the Canadians are pressing on with s services and that plans for these are well advan Indeed, the rapid development of health-insur schemes has been one of the major topics of this meet Discussion of ways and means has almost succee consideration of the general principles and, in partic the type of administrative machine required and training of administrators loom prominently. In connexion it is interesting to note the general bewil ment of the Americans at the relegation of the Br medical officers of health to a relatively minor rôle in National Health Service. Americans find it hard to un stand that the special training in administration rece by the M.O.H. has not been found of major value, and question whether lay control may not spread thr the N.H.S. and dominate it. This is no academic prol for them, because in the rapid expansion of hospitals social services of the next few years they face adm trative problems beside which our own will ap relatively simple. Federal grants under Public 725 (the Hill Burton Act) are going to speed up hos and medical-care projects and also research in fields. The training of administrators of the right cal to deal with these new developments is there fundamental, and it is in reaching common gro on matters such as these that this annual meeting excelled.

The British representatives were few in number were given important places in the programme. Percy Stocks startled his audience with the ques "Morbidity Statistics—Do We Want Them?" National Health Service figured largely in info discussion and in two formal sessions. In a joint mee of three sections, all four principal speakers were with expert knowledge of one or more parts of the ser and the interest aroused was shown by the fact that auditorium in the Penn Top at the Hotel Statler filled and overflowing. Prof. A. L. Banks, lately of Ministry of Health, described the framework of scheme, and was followed by Dr. J. S. Collings, Australia, who has been studying general-practitic services in Great Britain and elsewhere. Dr. J. T. R Edwards, representing the British Medical Associat spoke on the medical profession and the service, Dr. J. A. Scott, deputy M.O.H. for the County of Lond concluded the main papers with one on the rôle of health officer. The discussants included Dr. Ba of the American Medical Association ; Mr. Bugl of the American Hospital Association ; Prof. H Leavell, of Harvard ; Miss Alma Haupt ; and Mr. Ph second place. Despite the indignities of being hed with nauseous drugs and the discomforts ated with the administration of subcutaneous saline Thomas has not complained. Even the cinder-tray een accepted as the inevitable alternative to a o liberty through a window no longer open. With and a certain fastidious condescension he will now with the milk, the egg-white, the fish, and the y cooked liver provided. All think the corner has turned and that it will now be only a few days he is restored to full feline vigour. There should re such patients ; perhaps in the veterinary world are.

* * *

en I first published an article the part I most ed was ordering reprints and proudly posting them my friends to show them I really had got something *Lancet*. That was early in the war, when I was paid a fifth of my present salary and was at least five richer. Now I have published a few more articles getting less enthusiastic about the reprint business. ever the article one gets quite a lot of requests prints, and when they cost as much as two shillings it is no joke giving them free to large numbers of ge doctors (mostly in America) who have dispatched d cards asking for them, or to secretaries of ican libraries who have done the same.

reduce excessive traffic in reprints, any doctor is sufficiently interested in a medical paper aut one ought to make the effort to write a nal note—it's better manners, it's more amusing he author, and it allows of a word or two mment or criticism which may be instructive rican papers please copy). Admittedly some of rinted forms are models of politeness and praise :

> would be greatly appreciative of receiving two copies ur most interesting article entitled *Struve's Terrible teral Anœmia* published in *The Lancet*, Vol. *i*, No. *6234*. *Feb. 20*. Year *1943*. Page *249* and any other reprints of lar nature.

t of what value is the sterile flattery of the printed ? I am sure that if the habit spreads (and it is common in England) we shall soon find little cards le at bookstalls thus :

Parent
ar Sibling. Thank you so much for the delightful *bedsocks*
Friend
Christmas
you gave me for my birthday. They are most *comforting*.
my wedding present
k you again. I should greatly appreciate any other gifts imilar nature.

Affectionately,
Yours Sincerely, *Arthur*.
Ever,

am not going to sign this communication because ou might think I was showing off that I had had al articles printed ; (*b*) you might think I was trying t a refund of two shillings a copy from America ;) you might write and ask me for a reprint.

* * *

less he has a sleeper, nobody, I imagine, would e to make a night journey by train ; but needs when the practice drives.

e carriage was old, which I did not mind ; it was cold and dirty, which I did. Having it to myself he first half of the journey I alternately shivered or rmed a series of ungainly pas-seuls to restore lation. At the half-way stop the carriage was ded by four young sailors whose conversation, nguished merely for its crude and repetitive obscenity, eved an all-time low. They grew tired at last, and, ng my permission for granted, put out the light. so many vast puppies they curled up to sleep. pite their discourse, their snores and grunts, and their lency to encroach on my scrap of territory with ooted feet, I did not resent them ; they warmed the e up appreciably. But, on reflection, I wonder for t particular amenities I paid a first-class fare ?

* * *

"The patient had an operation for intestimonial truction . . ."

Letters to the Editor

THE SMALLER HOSPITAL

SIR,—As a general practitioner with a practice largely made up of families, I wish to record my great distress at the closing or transformation of some smaller hospitals in and around this part of London.

In sending a patient to an outpatient department one is concerned first with the quality of the opinion and treatment to be secured, and next with obtaining this at the minimum expense to the patient in terms of fear, time, and general sense of being adrift in a big organisation. This matters most, perhaps, when dealing with children and with those whose complaint is linked with shame or agitation. In the smaller hospital there is less change of personnel as a general rule ; even the porter at the door is more likely to become a friendly acquaintance, and there is a reduced chance of trying to explain things all over again to yet another doctor. Waiting time is nearly always shorter, the waiting-hall smaller and less crowded. A sense of continuity in a long case is usually greater both for patient and practitioner. When making arrangements for children and their tired mothers, or for patients with venereal disease, I almost always choose the small individual hospital in preference to the special department of the larger one. The gratitude of the patients is very great. Now we are faced with the loss of Paddington Green, the Lock, the Royal Waterloo, and the Samaritan, and are offered in each case the already overcrowded departments in the large and almost inevitably more impersonal neighbouring hospitals.

It seems indeed that these smaller hospitals, with their excellent tradition, medical and human, are being sacrificed to some plan. The basic idea that a plan exists only to be of use to the human beings it serves is indeed obscured. The argument for these " reforms " is as always the Greatest Good of the Greatest Number ; but that number is made up of human units, whose loss is usually great in proportion to their massing.

London, W.2. ANNIS GILLIE.

SIR,—Your readers are probably familiar with the decision of the board of governors of St. Mary's Hospital to convert Paddington Green Children's Hospital to adult use and for the reason which has been given for this action—namely, the excess of children's beds in the St. Mary's group over the number recommended in the Goodenough report. They may also have read the Ministry of Health circular R.H.B. (49) 132 which, together with your leading article, (Oct. 15) encouraged many to believe that the board might reverse their decision. Unhappily, there is no sign of any change of heart.

I am therefore writing, as chairman of a committee which is composed mainly of members of the local public and which is non-political, to give publicity to this fact. It seems right that the profession should know exactly what is happening because this is certainly no academic medical dispute. In Paddington and neighbouring boroughs a great wave of spontaneous public indigation has occurred and now finds expression through the Save the Children's Hospital Committee. Twenty thousand people, mostly local, have already signed a petition, and further evidence is found in the resolution passed by the Paddington Borough Council on Nov. 1, after a special committee appointed by them had investigated the matter, deploring the decision of the St. Mary's board. It is apparent that the board of St. Mary's Hospital have failed completely to understand the depth of feeling which their action has aroused. Their explanation, that students must be properly them. There are only two things I am pretty certain about—that exertion during or immediately after a meal brings on an attack; and that eating a sweet or two or a piece of chocolate soon after a meal does the same.

Two years ago there was a sudden interest in this dumping syndrome, and it was suggested that many of the attacks were due to hypoglycæmia. The delayed ones probably are, and most gastrectomy cases have an abnormal sugar curve, as I have (see table). But this does not seem to explain symptoms immediately after a meal, nor do to my mind any of the other suggestions offered, except perhaps distension of the jejunum.[2] I do tend to bring up wind just before an attack. X-ray examination shows no delay in emptying now.

Time	Blood-sugar (mg. per 100 ml.)	Blood-pressure (mm. Hg)	Urine
Before glucose	66	..	No sugar
Min. after glucose:			
10	181*	119/62	..
20	206	..	..
30	200	..	No sugar
40	200	..	..
50	112†	118/64	..
60	106	..	No sugar
70	100	..	..
80	93	..	..
90	93	..	No sugar
100	93	..	..
110	86	118/64	..
120	86	..	..
130	67	..	..

* Onset of slight attack. † Attack over.

This then is the situation $3^1/_4$ years after operation. If anything the attacks get more frequent and more severe as time passes. The really curious feature is their extraordinary variability. I had an attack, mostly rather severe, every evening last week. Yet I may go a week or even a fortnight without one; I can't even suggest any explanation for this.

There seems to be nothing I can do to diminish the frequency of these attacks and so far no treatment has been of any value, though I fancy gr. $^1/_2$ of ephedrine shortens them somewhat. I cannot say they seriously affect my enjoyment of life, though when I have a series of severe attacks I do get a bit gloomy, but they are very irksome and they definitely restrict one's activities. The main trouble is the unpredictability of the attacks, and the consequent uncertainty as to what one can and cannot undertake. One can never tackle anything involving exertion after a meal, and I hardly dare accept any social engagements or attend any professional meetings in the evening, which often mean a hurried dinner, because I do not know whether I can cope.

Two comments are perhaps worth making. The first is that I don't think the layman would for a moment connect minor attacks with his previous operation; he might well fear that they indicated some heart-disease. My second point is that gastrectomy is at times performed on cases which, judged from the pathologist's point of view, would almost certainly have recovered with adequate medical treatment. I have seen quite a number of stomachs removed in which the ulcer was obviously recent, quite small, and looked as if it ought to heal given the chance. I dare say many patients will not or cannot afford the time for really thorough medical treatment; this applied in my own case. But how much weight should the surgeon give to this syndrome when he is considering doing a gastrectomy for ulcer? No doubt, what with the continual vomiting and my age, I was bound to have a gastrectomy; and the attacks, with all their unpleasantness, are I think, preferable to vomiting every night. But if I had known that I was going to be in for these attacks and had had just a gastric ulcer with its accompanying pain I would rather have put up with that.

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[2] Leading article. *Ibid*, Oct. 1, p. 613.

In England Now

A Running Commentary by Peripatetic Co

RANCID cod-liver oil. Sounds bad and smells How well I recall the intolerable stench of Dr. compound fracture ward in the Magdeburg city one summer evening in 1934. I am sure of the because in the afternoon I had listened to the raucous voice explaining why he had slain his Roehm. The fractured limb was wrapped in saturated with the oil and then immobilised in a splint. Oily pus oozed from the case, a piquant contr to the carbolised asepsis of the other surgical war for Dr. Löhr was one of the first disciples in Germany Joseph Lister. Did the fractures heal in their unbo bath? Yes, without exception, without pain, witho fever. I brought the news home with me and heard similar success in other hands; one of them put t treatment on a scientific basis by inquiring into t vitamin content of the oil. Then came the sulphonami epoch and the oil was outdated and forgotten. I too h forgotten until last week when Timothy, my white to returned from the vet where he had gone for a septic b (my sister also has a tom). "Dress the wound freely on a day with this lotion," said the vet. "I'm afraid doesn't smell very nice. We emulsify the sulphonami with cod-liver oil. We find it works better." Thus d my accursed smell come home to roost.

* * *

I understand that, when an ancient monument h to be dismantled, a true and faithful record is made all that it contains. As an obituarist of long—if not hi —standing, I feel sure that there is an example to followed here, and, thinking as usual of our old frie posterity, I should like to plead for more bilaterali in obituary writing. The present tendency in obituari graphy is to dwell at tedious length on the thumpi virtues of the lamented. One or two of his more endeari foibles may receive passing reference, but little or no spa is devoted to his vices, follies, flaws, or weaknesses character. Reading the obituaries written now th historian of the future must assume either that we we all plaster saints or else that our obituaries have n historical value. This, I think, is a pity. One realise of course, that such bald statements as "except for monotonous habit of beating his wife every Saturday night, X was a monument of civic virtue" may come an unpleasant reminder to his widow; on the othe hand, to feel that she will no longer have to endure tho all too frequent castigations has its cheering side.

One further point. Obituaries ought to be writte ante-mortem and we should all be given the opportunit of reading, but not altering, our own. This might stimu late us to strive for good ones and result in a remarkab moral improvement all round. What could be pleasante than to receive one morning a revised and more laudator draft?

* * *

At this morning's surgery a lady mentioned that on of my colleagues had given her husband penicilli lozenges for tonsillitis. My suppositories had not cur her bleeding piles, she continued, and so she had used couple of the penicillin tablets with immediate a lasting relief. Her elation at this therapeutic triump filled me with a wild surmise concerning the stypti and healing properties of local penicillin. I racked my brains in vain for details of its rectal use, marvelling a this gap in the vast literature on the antibiotic. Proceed- ing cautiously I first inquired if she had actually inserted the tablets per anum, but unfortunately for my projected paper it turned out that she had swallowed them.

* * *

When we first had him as a very small kitten we weren't sure of his sex so called him Doubtful Thom When, in the light of his subsequent behaviour, Since doubt was removed he became True Thomas. His recent operation he has lived up to that name. attack of what the vet calls "cat flu" has been a matter of the gravest concern. The drawing-room has been turned into a private ward and other work has had to receive that continuity of management which is essential to the successful outcome of ent.

ria Hospital, Blackpool. **DAVID L. CALDWELL**
Assistant Chest Physician.

—The correspondence evoked by Mr. Francis's of Sept. 24 indicates the concern felt regarding the t position in the "control" of tuberculosis. Yet are those who are conscious of the advances that een made and who believe that tuberculosis may trolled by "combined operations."

close coöperation between an alert general-practi- service, an efficient hospital service, and the health ment of the local authority, it should be possible t the condition effectively. The so-called division inistrative control does not, I submit, present the les that some see in it. The transfer of the facilities agnosis and treatment to the regional hospital establishes a closer link with the hospital, and es greater freedom of action for the chest physician, no longer bound by considerations of local and mental finance. The retention of the preventive vironmental services by the local health authority s on that authority the responsibility for social ine. Thus the two sides of the disease—individual ocial—are linked through the physician to the clinic, whose function is to view each patient as cal point for the "combined operation" of domi- and hospital treatment, and thus to marshal not the hospital services for the treatment of the dual, but also the several departments, both l and voluntary, that alleviate the economic n of the household and prevent the spread of ion.

he sphere of treatment there still exists the antag- between the devotee of conservative methods and eliever in a more active approach. While bed rest ays the foundation of treatment, it often does not by itself, and it is wise to use a combination of arious methods, both in the home and in the al, being ready to change the combination as the t's condition fluctuates. The ideal place for such a en is the hospital or sanatorium, but unfortunately t-term" admission to hospital for the induction lapse commonly results in prolonged hospitalisation o complications; and the "quick turnover in the orium"—to quote Dr. Hoffstaedt (Oct. 8)—just not exist. Domiciliary induction is fraught with too dangers to be undertaken lightly, though it may value in carefully selected cases. The complications llapse therapy are so common and of such sudden ften inexplicable onset that a casual approach is to voided. The patient should not be encouraged to on collapse therapy or any other *single* method of ment as a sheet-anchor, but should be trained to the position steadily and to see it whole.

the other hand, administration of chemothera- c agents in the home, if governed by regular patho- l assessment, may prepare a patient, without risk, urther and more active treatment on admission to ital; or conversely it may arrest decline in a condition is not responding to collapse therapy induced at an er stage. I sympathise with Dr. Temple Clive in desire to "receive patients 'pre-conditioned' by rest only," but I believe this ideal cannot be attained e the shortage of institutional beds continues. It nperative that some form of treatment should be d to bed rest and ancillary nourishment in order bviate the decline that often takes place under ciliary treatment. At the time when the patient is itted to a sanatorium, a detailed report of all findings, skiagrams, should be supplied by the chest physician ct to the sanatorium physician.

For the control of tuberculosis we require:

(1) Early reference of suspected cases to the chest clinic by the general practitioner.

(2) Efficient means of diagnosis at the chest clinic.

(3) "Pre-hospital conditioning" by a planned combination of selected methods of treatment.

(4) Prevention of the spread of the disease by public health measures, by regular examination of "contacts," and by regular mass-radiographic surveys of selected groups of the population.

(5) Hospital inpatient treatment of the patient.

(6) Subsequent vaccination of tuberculin-negative contacts with B.C.G.

(7) A gradual and graded return to work in the more successful cases, with regular inspection of patient and "contacts" at frequent intervals.

(8) Adequate housing of the population.

Until these can be attained those working for the alleviation of tuberculosis must coöperate in a systematic combined operation.

D. L. PUGH
Chest Physician, Mid-Kent Area,
South-East Metropolitan Regional Hospital Board.
Maidstone.

CATALOGUE OF MEDICAL FILMS

SIR,—Two years ago, with the aid of a generous grant from the Royal Society of Medicine, the medical committee of the Scientific Film Association set up a master file of data on medical films. This includes details of production, distribution, and content, and a provisional grading of each film. It covers all the films in existence in this country up to 1946, and is being added to constantly. With details of over 800 films, it provides the most comprehensive collection of data about its medical films that any country in the world (with the possible exception of Canada) can show. From this master file was prepared the R.S.M.–S.F.A. catalogue of medical films. The first edition of 1000 copies was exhausted in twelve months—a remarkable index of the widespread interest in medical films.

We were faced with the problem of deciding whether to reprint or to prepare a new edition. As the lay-out of the first edition was cramped by paper shortage, and as there are many new films to be included, we have decided in favour of a new edition. We are constantly getting requests from abroad as well as from this country, and we ask the hospitality of your columns for this explanation of why the catalogue will not be available for some months yet.

Scientific Film Association,
4, Great Russell Street,
London, W.C.1.

KENNETH GOADBY
Chairman, Medical Committee.

URÆMIC ŒDEMA OF THE LUNGS

SIR,—Since the publication in 1947 of an article on "uræmic" œdema of the lungs,[1] I have had a number of inquiries concerning radiographs showing typical shadows in the lungs of patients who were not uræmic. The following note is an attempt to clarify the position.

During the past fifteen years there have been occasional descriptions of radiological changes in the lungs of patients with hypertension and renal failure variously designated as "uræmic" or "azotæmic" œdema or pneumonia. The pathological findings in 4 such patients who died formed the basis of my own investigations: in these the lesion causing the shadows proved to be a non-infective albuminous and fibrinous pulmonary œdema in varying stages of organisation. In a further, non-fatal, case the shadows rapidly resolved with rest in bed, and it was postulated that their basis had been a purely albuminous œdema. The pathological changes are identical with those in so-called rheumatic pneumonia: indeed fibrinous œdema from any cause may give rise to the same microscopic picture. I believe that,

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1. Doniach, I. *Amer. J. Roentgenol*, 1947, 58, 620.

taught, does not carry conviction. Hitherto there has been no suggestion that the doctors produced by St. Mary's are less capable than their colleagues.

My committee feels a need to work hard to bring about the final decision in the near future, since a hospital which is under threat of annihilation works under strain and it is only a matter of time before signs of deterioration must appear through the unwillingness of serious workers, whether doctors, nurses, or others, to spend their energy on tasks which have no relation to a future.

Surely the proper course is to allow the Children's Hospital to continue the work which it has carried on with acknowledged success for sixty-six years, and to allow its teaching facilities to be transferred to another teaching-hospital group less fortunately situated than St. Mary's.

MICHAEL HARMER
Chairman, Save the Children's Hospital Committee.

15, Berkeley Court, Baker Street,
London, N.W.1.

ACUTE LARYNGOTRACHEOBRONCHITIS TREATED WITH CHLOROMYCETIN

SIR,—In their preliminary communication of Oct. 22,[1] Professor Moncrieff and Dr. Weller imply that hitherto acute laryngo-tracheo-bronchitis has been uninfluenced by chemotherapy. In my own experience chemotherapy and treatment by antibiotic have reduced the mortality. I am allowing for the wide variations in the severity of acute laryngo-tracheo-bronchitis—it is not uniformly an "alarming emergency"—and also for the present enfeebled virulence of streptococci and staphylococci.

On the subject of ætiology the writers state: "There is some evidence that it is caused by a virus." A few lines further on they refer to it as "the infection" but do not refer to an invasion of the tracheobronchial tree by pyogenic micro-organisms—the final cause of acute laryngo-tracheo-bronchitis. There is a good deal of evidence that the process ending in acute laryngo-tracheo-bronchitis is initiated by a virus such as that of influenza or measles or variola or the "common cold"; the "softened" mucous membrane is then secondarily invaded by the hæmolytic streptococcus, *Staphylococcus aureus*, the *Hæmophilus influenzæ* type B, or the pneumococcus. There is some evidence also that the complete symptom-complex can be caused by the pneumococcus or *Hæmophilus influenzæ* acting singly.

These micro-organisms have been recovered in acute laryngo-tracheo-bronchitis from the oronasopharynx, the larynx, the trachea, and occasionally the blood-stream. The picture post mortem is typical of an overwhelming infection by pyogenic micro-organisms. The symptom-complex is also of course seen in adults. It is not unreasonable to suspect in the case of Professor Moncrieff's patient, who showed dramatic improvement, that 'Chloromycetin' may have directly affected the pyogenic micro-organisms. The scope of action of chloromycetin is wide.

As an adjuvant measure bronchoscopy is usually harmless; but when the child becomes "dry," when there is a gummy, crusting exudate in the tracheobronchial tree and necrosis of the mucous membrane, bronchoscopy is harmful and distressing. At this stage, too, oxygen just adds to the dryness. Indeed when the child becomes "dry," steam from a kettle or other humidifier is the only treatment of value, though at the moment it appears to be out of fashion.

In the penultimate paragraph of the article the writers say: "It will be noted that the children who survived were those in whom tracheotomy was performed early." If tracheotomy is done early it will in many cases be done unnecessarily; the child must be given a sporting chance to get through on his own—delay will
tracheotomies and avoid some deaths.

It is only too true that in the acute case all
may be useless, and it is difficult to see what tr
can prevent the acute myocardial failure or supra
œdema which may be precipitated in a few hour
fact death appears to be inevitable if the inf
really acute. In the less acute case recovery s
takes place unexpectedly. Such an unexpected re
occurred in Professor Moncrieff's case, and we
hope that it was due to chloromycetin—for we
need an effective remedy for acute laryngo
bronchitis.

Grove Hospital, London, S.W.17. J. C. McE

CHARGES FOR PRESCRIPTIONS

SIR,—The announcement has been made quite
that it is the intention of the Government to
a charge upon all prescriptions. There is general
ment that in the case of a great many prescription
is very desirable indeed and will have the eff
reducing irresponsible demands for placebos and
domestic remedies. It is, however, needless to
out that there is a large class of patients who are
the periodical necessity of filling in prescriptions.
applies particularly to diabetics requiring insulin a
sufferers from pernicious anæmia requiring one for
another of liver or stomach extract; it further a
to those with many other deficiency conditions, of
myxœdema and diabetes insipidus are obvious exam
It would be a great hardship upon these patien
they were called upon to pay a charge every time
required the filling in of a new prescription.

It is to be hoped that in drafting the new regul
due attention will be paid to the requirements of
patients.

The Royal Hospital,
Wolverhampton.

S. C. DYKE
Director of the Diabetic Cli

CONTROL OF TUBERCULOSIS

SIR,—I have read with interest the letters of
Temple Clive (Oct. 22) and Dr. Jeanes (Oct. 29).
seems to me that they bring out the necessity for
chest physician to have complete control of the pat
from diagnosis, through the period of institutional tr
ment, and back to general management and follow
in the chest clinic. I realise that the organisation
such that in many areas this is not possible, but I th
that it is an ideal which should be kept in mind du
this period when so much reorganisation is going
Also where major surgery is required some breaks in
continuity are sometimes necessary.

Tuberculous patients are notorious for their att
ment to one physician, and I believe that their mana
ment is made much easier if the one physician and
immediate local colleagues, with whom he is in c
contact, are responsible for the complete management
the case.

If such a procedure as I have suggested is adopt
then the chest physician himself will have to deal wi
any complications that he has produced by his domicilia
treatment before admission, and will not be able to p
on the clinical problems that he has created to a d
colleague. This will make him more careful in
selection of cases for collapse therapy and will teach h
by experience—bitter, if necessary—the right type
case in which to try active domiciliary treatment, a
the effects of para-aminosalicylic acid on the cour
the disease.

Close liaison between the chest physician respon-
for domiciliary management and the sanatorium phy
cian responsible for institutional treatment is essent
as Dr. Jeanes points out; but if the two responsibilit
could be amalgamated in one person, then the pati

fever may temporarily lower the level of serum osphatase where this has been high.

ins and Hodges [5] have shown that injections of rone propionate cause a rise in the level of acid atase in cases with bone metastases from carci- of the prostate. This "testosterone-stimulation , they say, most helpful in the differentiation tatic carcinoma with secondary growths from hyperplasia. They suggest that 25 mg. of testos- propionate should be injected intramuscularly r 15 days, and they recommend that the serum osphatase be estimated at least every other day.

J. G. ALEXANDER
ool Royal Infirmary. Registrar in Clinical Pathology.

n the article by Mr. Burgess and Dr. Winston the heading of table II (p. 791) should read: -acid-phosphatase levels in prostatic hyperplasia ned histologically."—ED. L.

PERATIONS FOR MITRAL STENOSIS

–Not everybody will agree with the surprise ed in your leading article of Oct. 29 that no t has been made to relieve the pulmonary nsion of mitral stenosis by creating artificial etence of the pulmonary valve.

ring possible active venomotor mechanisms (which, tive, would provide additional factors in support arguments set out below), the high pulmonary pressure and left auricular pressure can be due to all of three factors: the resistance of the mitral o the flow of blood through it; increased output right ventricle (this can only be a temporary ; or the regurgitation of blood from the left le. If, as Harken and his team are quoted as ; an operation should only be performed when s and regurgitation coexist, the last of these must important factor, and the high left auricular e therefore also represents a potential if not direction of flow "working back" through the nary circulation.

rtunately, Bland and Sweet [6] do not give details fluctuation- in left auricular pressure in their ts, but if the figures of 400–500 mm. (not ml!) er at all approximate to a mean pressure, creating ificial pulmonary incompetence might have unfor- consequences. Bland and Sweet's operation dis- of at least some of any regurgitated blood by ping" it in the systemic veins, which apparently modate it without any significant rise in pressure. he volume of blood, and consequently the pressure, (smaller) pulmonary venous system is decreased.

ne high pulmonary arterial pressure is necessary to ain the flow of blood through the pulmonary tion against the increased "peripheral resistance" ced by conditions in the left auricle (whether ely or actively), it is surely more rational to se this peripheral resistance (as is achieved by and Sweet's operation) than to decrease the of the right ventricle to maintain such a pressure.

possibilities can also be examined in a different It appears from Bland and Sweet's results that the volume of blood which "rushed with great force" gh the channel from the pulmonary into the azygos is insufficient to produce right ventricular failure h-output "self induced" failure. It would therefore re an extremely nice judgment in making the cial incompetence so that a chamber with such nctional reserve as the right ventricle would be nted from "flooding" the lung, without also ng right-sided congestive failure—a result which Bland and Sweet's operation (with the possible exception of case 5) appears to have the merit of avoiding. It seems reasonable to regard the operation as a semi-permanent, self-regulating pulmonary venesection—a form of safety-valve protecting the pulmonary venous system (and therefore the lungs) from excessive rises of pressure due to temporary imbalance between right and left heart-output or from the pressure of mitral regurgitation.

In the preceding reasoning there has been strict avoidance of the use of some more recent concepts of cardiac failure; but one cannot forbear from suggesting that the whole situation is more readily comprehensible in the light of McMichael's views.[7] Whether or not this is so, we have here an example of conditions in which conceptual reasonings involving injudicious interchange of "pressures" and "volumes," when pursuing a problem in hæmodynamics, is potentially dangerous.

All this is, of course, so much "arm-chair stuff," and the problems must be worked out on data gained in practice. This involves accurate pressure and flow measurements at all points in the circulation, especially in the neighbourhood of the left auricle—technically very difficult in any circumstances, let alone, I imagine, those obtaining at operation on these patients. In the meantime, Bland and Sweet's operation seems to have considerable empirical justification, and, to me, a fairly rational basis.

Middlesex Hospital, London, W.1. MORAN CAMPBELL.

HOSPITAL COSTS

SIR,—The estimates for the year 1950–51 are now being prepared for submission to the Minister by regional boards and boards of governors of teaching hospitals. Last week's leading article is therefore timely. I feel, however, that the placing of the main responsibility for the increased hospital cost on medical staffs is rather unfair and that the answer to this problem is not quite as simple as you suggest.

It has always been a well-established principle in the past that the person with the privilege of spending money should also have the responsibility of finding it. This is the prerogative of every family unit. Before the appointed day this worked out reasonably well in the case of both the voluntary and local-authority hospitals. An eye had to be kept on subscriptions or on the rates to be levied on the community. Owing to the sudden release from the "beggar state" of the old voluntary system and from the parsimonious atmosphere of some local authorities, the medical men working in hospitals may be asking for more and more elaborate equipment and costly facilities. The lay board to whom they report, having likewise no responsibility of finding the money, very naturally tend to leave the pruning of expenditure to the Minister. The Minister, with his lack of local knowledge, is in the worst possible position to do this effectively, and, as you say, is liable to "cut away the fruit buds with the useless wood."

It was a fundamental psychological error on the Minister's part to assume, when he framed the Act, that his local agents, being human beings, could be expected to act with the maximum sense of responsibility in the expenditure of funds coming from a "remote" source.

A method will have to be devised to implement more effectively the old adage about "cutting the coat according to the cloth." There have been various methods suggested. Boards, like universities, might be given a grant to cover five years and their expenditure would be limited to this amount. Under this system, however, the Minister would cease to have responsibility for the day-to-day running of the hospitals—a constitutional point regarded as necessary. It has also been suggested that new boards, democratically elected,

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iggins, C., Hodges, C. V. *Cancer Res.* 1941, 1, 293.
and, E. F., Sweet, R. H. *J. Amer. med. Ass.* 1949, 140, 1259.
7. McMichael, J. *Amer. J. Med.* 1949, 6, 651.

as suggested by Rendich et al.,[2] heart-failure, not uræmia, is the basic lesion. The distribution of the shadows is in fact identical with that seen in the rarely obtained radiographs of acute fulminating pulmonary œdema due to left-sided heart-failure.

The interest of these "uræmic" œdemas which occur occasionally in hypertensive renal failure lies in (1) the paucity of clinical symptoms and signs, and (2) the fibrinous nature of the œdema in fatal cases. I have suggested that the uræmia so modified the permeability of the lung capillaries that they allowed the passage of a protein-rich transudate into the alveoli in patients suffering from heart-failure of only moderate severity.

The non-uræmic cases brought to my notice during the past two years were suffering from either myocardial infarction or mitral stenosis, with or without aortic valvular disease; and all had fairly severe acute heart-failure without clinical signs of fulminating pulmonary œdema. The lung shadows were not always bilateral; they showed a typical hilar distribution flaring out butterfly-fashion towards the periphery. Further similar radiographs have also been seen in hypertensive renal disease and in non-uræmic cases of fulminating pulmonary œdema, some of which resolved in a few days.

It would appear that in the spectrum of pulmonary changes in acute heart-failure, varying from congestion to fulminating œdema, factors other than the intensity of the heart-failure may modify the pulmonary picture. Uræmia is one of these factors. Another possible one, noted recently in post-mortem material, is severe anæmia. An obvious third factor is superadded respiratory-tract infection. The peculiar butterfly-shaped distribution of the transudate in the lungs remains an enigma.

Pathology Department, Postgraduate Medical School of London. I. DONIACH.

A PSYCHIATRIST LOOKS AT TUBERCULOSIS

SIR,—In your annotation of Oct. 29, you say that "the statement that the prevalent mood among the tuberculous is that of anxiety and depression will come as a shock to many." Later you add that "much the same situation confronted troops going into battle." These are formidable misconceptions.

The conclusion that people become depressed when stricken with tuberculosis is scarcely profound. In fact such is the only normal reaction. Nor is it easy to see why it should cause a shock to anyone. Certainly it is well known to every doctor who has worked among such patients—unless he has lost all insight into what constitutes true cheerfulness as against its studiously and intermittently contrived counterfeit. To give the impression that he accepts at their face value all the appearances of cheerfulness assumed by his patients may be an important part of his medical care; but to be himself deceived by what is often no more than a gallant attempt to put up a brave front upon an abominable affliction would be so ingenuous and complacent as largely to vitiate his worth as a physician.

How different is the strain imposed upon troops going into battle. Experience promises them swift exchanges of fear and exhilaration followed by hunger, exhaustion, and sleep. Death or wounds, if they should come, must come swiftly. The contrast could scarcely be more complete.

From this same analogy of war there could, however, be drawn an authentic parallel with the plight of the tuberculous. The prisoners did indeed find their malady to be one of "unknown and uncertain prognosis." Moreover it produced a like effect. During many months and years of hopes deferred their bizarre fluctuations of mood, inconsequential fits of gaiety and quick-changing hates and attachments, bitter of the privileges of the free, and dragging sense of diminishing contact with home, developed in attitude and a behaviour which mirrored with a exactitude that to be found in a sanatorium ward

Bristol. IAN MCD. G. STEWA

SERUM ACID PHOSPHATASE IN PROSTA CARCINOMA

SIR,—In your issue of Oct. 29 Mr. Burgess and Winston Evans come to the conclusion that the mination of serum acid phosphatase is of little val most cases of prostatic carcinoma. However, Her found that the serum acid phosphatase was increas 29 out of 35 cases of prostatic carcinoma with metastases, and in 12 out of 47 where there w radiological evidence of metastases. Sullivan e recorded an increased serum acid phosphatase in 11 of 130 cases of metastatic prostatic carcinoma, a 11 out of 70 where there was no positive eviden metastases.

The level of the serum acid phosphatase depend only on the character of the tumour producing pro phosphatase but also on the extent of invasion of and lymph channels and probably also on endog androgen production. It has been shown that a natural pH of serum, and at body temperature prostatic phosphatase is rapidly destroyed. The thus a balance of continuous inflow and destructi prostatic phosphatase when the prostate unde malignant change and invades the capsule.

A notable advance was made by Herbert[3] whe demonstrated that prostatic acid phosphatase in s is destroyed by alcohol; but acid phosphatase in no serum (produced by extraprostatic tissues such as spleen, bone, and kidney) is alcohol-stable. The mod increase in serum acid phosphatase sometimes fou bone and liver conditions (e.g., Paget's disease hepatitis) is all alcohol-stable, whereas in metasta prostatic carcinoma with elevated serum acid phatase, treatment of the serum with alcohol lowe titre usually to normal. Occasionally even when the serum acid phosphatase is not elevated a signi amount of prostatic phosphatase in the serum may e a diagnosis of prostatic carcinoma to be made. A con fall of more than 1 unit after treatment of the seru alcohol is almost diagnostic.

In 6 cases of prostatic carcinoma with bone meta I have found the initial serum acid phosphatase t markedly elevated and diagnostic in 3. In the oth patients the initial serum acid phosphatase was 5·5, 7·0, and 4·5 units per 100 ml. However, alc inactivation in these cases showed the presence of 3·0, and 1·3 units per 100 ml., respectively, of pros phosphatase in the serum.

It seems, therefore, that in all suspected cas prostatic carcinoma in which the level of serum phosphatase is normal or slightly elevated, it is esse to proceed further and carry out alcohol inactivatio the serum.

Manchester Royal Infirmary. M. H. OELBAU

SIR,—I am most interested in the informative paper Mr. Burgess and Dr. Winston Evans in your issue Oct. 29. They have, however, omitted two impor references.

Huggins et al.[4] point out that the patient's bo temperature at the time of taking the blood is import ιic one, but one of ethical and intellectual values, so to be judged by us. I hold with profound tion that a humane and learned profession must sole guardian and judge of its values, and cannot trade these away because times will be hard, or em in commission for monetary reward.

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[2] Rendich, R. A., Levy, A. H., Cove, A. M. *Ibid*, 1941, 46, 802.

[1] Herbert, F. K. *Quart. J. Med.* 1946, 15, 221.
[2] Sullivan, T. J., Gutman, E. B., Gutman, A. B. *J. Urol.* 1 48, 426.
[3] Herbert, F. K. *Biochem. J.* 1944, 38, 23; *Ibid*, 1945, 39,
[4] Huggins, C., Scott, W. W., Hodges, C. V. *J. Urol.* 1941, 46,

ugh I find some of my colleagues moved to an easy ynthetic scorn when they are reminded of the t remains true that we are the inheritors of the ratic tradition with all that this imposes upon l we may not hand over our values for grading by ern government, knowing as we do what are the erations that must move the modern politician: l-to-mouth expediency, a lust for power over the f their fellow-men, and half-baked ideologies that ıo roots in culture, no love of learning, and no of historical sense.

llow government to be our principal paymaster is ing, but it is quite another to permit it to impose us a crude, arithmetical classification of all those derables that make up true distinction in our sion. To do this is to abandon our responsibilities, me arrant materialists, and to condone the setting a false set of values that no-one can hold in t.

threatened evil is not less because learned bodies ıominated the members of the Awards Committee, so doing have given away what it is their prime o preserve. If they really understood what they loing, we should be forced to look upon their action regard as but another example of that "trahison ercs" that is at once a factor in, and a grim sign of, eneral lapsing of all standards that characterises me.

lon, W.1. F. M. R. WALSHE.

—Regarding this very great experiment controlled man nature, permit me to put forward the suggeshat all persons enjoying consultant rank be asked rticipate, in order that a true assessment may be ed. This could be done by private ballot, each ltant giving his opinion of colleagues of equal rank hospital and area and of his specialty in the ı.

Department of Pathology,
eral Hospital, Northampton. R. M. HEGGIE.

AMINO-ACIDURIA

—Your review of Professor Snapper's *Medical s on Bone Diseases* (Oct. 29, p. 798), referring to ni's syndrome, states that "There is no other n condition in which persistent amino-aciduria s." This is not true. Uzman and Denny-Brown[1] shown that in hepatolenticular degeneration on's disease) there is severe and persistent aminoria.

ave at present under my care a patient suffering this peculiar disease who excretes in his urine in 24 hours more than 1000 mg. of amino-nitrogen on rmal ward diet (normal excretion 100–200 mg.). In the case described by Uzman and Dennyn the total daily urinary excretion of aminogen varied between 800 mg. and 1500 mg. In neither ese two cases is there any clinical or laboratory ence of renal disease or hepatic cirrhosis.

e question that naturally arises is whether Wilson's se is the result of a fundamental defect in the bolism of amino-acids. The disclosure of the same abolic disturbance in unaffected members of the ent's family certainly suggests such an explanation.

rdıff. JOHN D. SPILLANE.

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[1] zman, L., Denny-Brown, D. *Amer. J. med. Sci.* 1948, 215, 599.

VASCULAR STASIS

SIR,—I think that Dr. Sevitt has Dupuytren wrong in his letter last week. If the following translation[1] is correct, then the burns in which I have observed benefit from exhibiting anti-histamine drugs include Dupuytren's 3rd-degree burns:

> "(3) The cuticle is destroyed and also the superficial part of the true skin, but the interpapillary processes with their sensitive nerve endings are thus left exposed; hence burns of this degree are very painful and accompanied by great collapse. They are indeed the most fatal variety from this cause, and a very grave prognosis should be given if they are extensive, burns involving the neck, trunk or both limbs being usually fatal, more especially if occurring in young children. The sweat and sebaceous glands are not destroyed and healing will thus be rapid, epithelialisation occurring from all over the burnt area and normal skin being quickly reformed, no contractures or deformity resulting."

The last is an ideal often not reached in the past, partly because burnt tissue continues to liberate toxic substances for days which causes the death of structures which would otherwise have survived. This phenomenon has even been demonstrated in the partly burnt stems of woody plants (Strasburger's Textbook of Botany).

Manchester. S. SHUBSACHS.

THE DOCTOR'S CREED

SIR,—Professor Platt (Nov. 5) asserts that we must either believe that God "is powerless to intervene against the evils of Satan and of man or that they are of His own creation." Is there not at least a third possibility, that God, having given man free will, for the time being deliberately refrains from forcing His will upon mankind? If man were a robot he would have to do the will of his maker without question; but there could be no development of character, no choice between good and evil. Neither is there any reason to assume that an omnipotent and omniscient God would necessarily be good.

There were doctors at Buchenwald and Auschwitz. How could Professor Platt prove that the behaviour of such men was criminal or that their implicit obedience to Hitler, Himmler, and other demigods was wrong? If it is denied that each man has an immortal soul, how is it possible to argue that all men are entitled to equal rights? A strong case could surely be made for concentration camps and the totalitarian régime.

Professor Platt talks about conscience, but this word connotes a conception of right and wrong. What is right and what is wrong, and what is truth? Were the doctors at Buchenwald camp justified in doing what they did if they thought they were right in obeying Hitler? Is private judgment the criterion; or are there eternal verities, and if so how are they to be discovered?

The evolutionary theory is concerned with the development and survival of the species and offers no evidence to show that truth, goodness, and beauty have operated any more than ugliness, bestiality, and vice in the survival of man. Indeed, it may seem that bad faith, bestiality, and cruelty may in the near future prove more potent and successful than goodness.

There are, it is true, many earnest doctors and beloved physicians who do not subscribe to any orthodox religious belief; but I venture to submit that they are all living on borrowed spiritual capital and are heirs of a Christian environment. There is no evidence to suggest that Christian ethics could survive for long apart from the witness and influence of men and women who truly accept and practise the Christian faith.

It is because every member of the medical profession holds Professor Platt in such high esteem that I venture should be set up with the power and responsibility of finding at least a proportion of the expenditure by levying rates. Doctors, however, have always been opposed to any kind of local authority administering professional services.

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[1] Romanis, W. H. C., Mitchiner, P. H. The Science and Practice of Surgery, London, 1937; vol. I, p. 58.

Even an item of expenditure which is necessary for the best welfare of the patient cannot always be justified if money is limited and when there are perhaps stronger claims on limited resources. Someone said recently: "In a planned economy medicine may have to be rationed like any other commodity."

Cardiff. DAVID G. MORGAN.

BEDSIDE LOCKERS

SIR,—In your leading article of Oct. 22 you note the difficulty of finding a place for the urine bottle, and the undesirability of using the recesses of the locker for this purpose. A simple way of overcoming this difficulty is to provide a strong wire basket of the appropriate shape which hooks on to the underside of the bed. Two hooks go over the long bar of the bed frame and a small hook fastens the bottom or inner end of the basket to the underside of the wire mattress. This device enables the patient to reach for the bottle with the minimum of movement. It is cheap and easily made, and if the æsthetic aspect is important it can easily be covered with a washable jacket. This arrangement will be found much more convenient than using the lower compartment of a locker, or, as I have found in one London hospital, a waste-paper basket under the bed.

London. W. P. KENNEDY.

CASUALTY WAITING TIMES

SIR,—I have been reading your interesting annotation of Sept. 3 on the valuable inquiry made by Mr. Patrick Clarkson[1] into the time spent by patients in the "front surgery" at Guy's Hospital. There are two points on which I would like to comment briefly.

One is that the distinction which has been drawn between time spent and time spent *waiting* in a casualty or outpatient department is an important one. It is the long waits with nothing happening that are so tedious and irksome to the patient; time employed in procedures in which he is a participant may not always be pleasant, but it is less wearisome and is likely to be recognised to be necessary and unlikely to give rise to complaint.

The other matter on which I desire to comment is the welcome reference, at the end of your annotation, to the patients' comfort. It is not so rare as it ought to be to find patients waiting (e.g., for an X-ray examination) under conditions which would be trying to a vigorous healthy person and which are much more trying, and may even be injurious, to a sick person; this applies to inpatients who are taken from their wards for investigation and treatment in other departments, as well as to outpatients. Usually in such cases there is some fault in the premises, but matters could often be improved if more thought were given to each patient's comfort. All the members of the staff are busy with their duties and they may forget how hard a bench becomes after a time, or how irksome it may be to continue long in one position (e.g., lying on one's back on a patient-trolley), or how much a sick person may be suffering from a draught which they, actively engaged, do not notice. Draughts are probably the source of the most acute discomfort, and unfortunately they are very common. The possibility of giving some protection by screens should not be overlooked. Sometimes one even encounters failure to take such an obvious precaution as seeing that a patient sent from the ward is sufficiently and suitably wrapped and (if necessary) a hot-water bottle. It might help matters if were definitely charged with the duty of arrangements for the comfort of waiting patients.

As a rule, however, the root cause of the in the premises; and this, again, is often many of the faults of our hospitals today—to the that most of the hospitals were designed for a different set of conditions from those prevailing Thus, patients may have to wait in a corridor be the need for special provision for them had not when the hospital was designed. The tremen growth in the volume of work imposed on co departments of hospitals (notably X-ray departm within the last 20–30 years, has given rise to m difficulties, because expansion of departments has been able to keep pace with the calls upon them. In ciency and unsuitability of waiting places are among many defects now crying out for remedy and aw the day when the only satisfactory remedy, involves new building, can be applied.

Ministry of Health, London. T. S. McInto

THE DISTINCTION AWARDS

SIR,—The importance of the issue must be my e for craving the further hospitality of your columns the question of "distinction" awards.

We must agree with Dr. Russell Brain (Nov. 5) the consultant body bears the major responsibility the situation in which it now finds itself. Ever since nationalisation of medicine became a live issue, it retreated step by step before the growing menace of central control of medicine, until at last it has bee possible for the registrar of the Royal College of Ph cians[1] to boast that the college is "unanimously" favour of coöperation with the Awards Committee.

Bowing to the so-called inevitable has become addiction with us, but we can scarcely plead in def that all this has happened simply because "we neg to inform ourselves" of what was in process. On complete political naïvety could have blinded us to destination of the path upon which we have chos enter—namely, the path of least resistance. The hop confusion of thought that characterises us is seen those who continue to drift along this path can be c "constructive" by Dr. Boldero in the letter I h referred to, and those who will not condone this are called "supine" by Dr. Russell Brain. Have w ceased to have their proper meanings for us?

If what is at stake were purely an economic issue, t would be some force in Dr. Russell Brain's defence distinction awards. Yet, even so, I find it hard to un stand upon what grounds of equity or logic he can s the egalitarian down-levelling of the N.H.S. as f the general practitioner is concerned, and yet fi objectionable for the consultant.

Are we not all members of the same profession, are not gifts of character, intellect, and profes ability as freely—if as unequally—distributed amo those in general practice as amongst consultants? I assumed that the consultant is a select and supe person for whom preferential terms may be asked? surely, upon any true assessment, the select man is he who asks more *for* himself, but he who asks more himself. And is this rare virtue a prerogative of consultant?

Little as, I am sure, Dr. Russell Brain would w so, he is in effect bidding us, with Omar Khayy "take the Cash, and let the Credit go, Nor hee rumble of a distant Drum!" For the truth is—and tainly my thesis is—that the issue is not primari mire so much its sincerity that I want to show he contradiction between the omnipotence and lence of God may be more apparent than real.

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[1] *Guy's Hosp. Gaz.* July 16, 1949, p. 218.

[1] Boldero, H. E. A. *Brit. med. J.* Sept. 10, p. 591.

od's existence is accepted, and with it His omnipo- nd benevolence, there can be no *real* contradiction attributes, for the following reason. If He is not lent He lacks something. If He lacks something nnot be all-powerful in the strictly metaphysical

ever, there is an obvious need for reconciliation n a God who is accepted as benevolent and a twisted in agony. Dr. Platt's particular example rve us well. On the one hand is a God, good and ; on the other is Buchenwald, a pit of insensate . The churchman, he predicts, will use the following ents to cope with the difficulty: (1) that these atters of Faith which we do not understand: t Buchenwald had some divine purpose incompre- le to man. They both resolve to much the same and I believe no intelligent Christian would use argument and feel he had solved the problem to isfaction. Incomprehensibility can solve absolutely g.

t there is a great difficulty and a heart-aching m here is as freely admitted by the theist as the . Nor has the theist the monopoly of things hard lerstand.

I suggest two or three arguments in connexion this problem which may serve to express the ian view. Firstly, what does benevolence mean? ans "wishing well." What good thing does God us? The theist replies, Himself. That is our sole se . . . not good health or prosperity or comfort. od. I believe that suffering does not interfere with urpose. I believe, from personal experience, that npossible to reach maturity without it. Secondly, theist suffering has a meaning . . . and a meaning nvolves our good. Thirdly, that meaning was made clear to us many years ago when God was mauled roken and died in blood and violence. He knew ng . . . and He knew His purpose . . . and the id not contradict the other.

aster. FRANK S. RICKARDS.

—It is most curious to an observer trying to be tial that Professor Platt should find in the existence rces of evil (typified, if he will, by Buchenwald Auschwitz) the chief objection to the creed of ianity. It is the existence of these forces of evil, urse, which Christianity claims as its only raison and they alone can make the enlightened nism, which Professor Platt advocates, a broken

there were no evil, Christianity would be totally essary and humanism enough to enable man to his destiny.

versity College,
ndon, W.C.1. R. H. HARDY.

—The reasons given by Professor Platt for his lief in God and Divine purpose in the affairs of this l have often been advanced. Man was originally ived in God's image, but the Fall of man changed is and in consequence the character of the world. ng as this situation lasts, so long will man be the m of the abnormalities and diseases which cause all distress.

take the argument a stage farther. Why does behave so badly that wars recur with sickening ency? Is not this because man has on the whole, for so long, renounced Divine direction and tried to age things on his own, exercising that free will h distinguishes him from the animal world?

ndon, W.1. W. R. THROWER.

SIR,—Professor Platt has done us all a service by pinning down his objections to a concrete instance (i.e., the child dying of leukæmia), but perhaps he has forgotten that Christianity cannot be explained without Christ. The anomaly whereby a God of love should allow a child to die of leukæmia is explained for the Christian by the equally astounding anomaly that He should allow Himself to suffer murderous death by crucifixion. The Christian postulates that the divine resolution of the anomaly of the child dying of leukæmia was achieved only after the divine identification with suffering man at the crucifixion, and goes on to say that human salvation is only possible by appropriation of the divine solution—in other words, by an emotional and intellectual adjustment to the death and resurrection of Christ as being the clue to all moral, theological, and ethical problems.

Liverpool. S. L. HENDERSON SMITH.

SIR,—Everyone will appreciate the sincerity of Professor Platt's letter and welcome the reason he gives for raising the problem of relating "the evils of Satan and of man" with an omniscient, omnipotent, and benevolent God. He feels that this difficult question should be answered "because it must be the stumbling-block of many thinking persons on the threshold of religion." He will not accept the answer that "these are matters . . . which we do not understand" (I have omitted two words—"of Faith"—which he has inserted I know not why). Surely there can be no other answer: for the problem of evil, carrying with it cruelty, neglect, and disease, seems beyond the range of human understanding, and so long as that is so we should openly admit it.

It can be argued that some suffering is helpful, and William Temple has written "A world in which both suffering and sympathy exist is preferable to one with neither"; but much of it is sheer waste and tragedy, evil and cruelty, serving, so far as we can see, no possible purpose. When we are asked the question "What is the origin and meaning of evil?" Christians and agnostics are equally unable to answer. Christians believe that God, the origin of good, has revealed himself to man by Christ, and we all know that the origin of evil has not been revealed. Without such revelations these origins, outside space and time, are probably beyond the reach of human discovery. A link is missing. Many able men have, like Professor Platt, regarded this as a bar to the acceptance of Christ as the revelation of a wholly loving God: others, equally appalled by evil and equally incapable of finding an answer, have yet accepted the revelation and learnt to love and follow Christ.

Many wise men believe that Christianity is the only remedy for this very sick world. Should the great remedy of Christian love and fellowship be disregarded because evil, the very thing it eradicates from the life of men, is unexplained?

All of us, Christians and agnostics alike, hate evil and cruelty. We Christians believe that we can ally ourselves with God in the fight between good and evil, God and Devil, a very real and critical fight here and now; and we hope to fit ourselves, by God's Grace, to continue that fight in the next world to the end. Without doubt, Professor Platt and his like are on the same side; it is sad that he should find himself unable to share with the Christian the joy of membership of God's family, and fellowship, come what may, with our Lord Jesus Christ. Yet it is likely that one day a great many agnostics will be found among the sheep on His right hand and Christians among the goats on His left.

Oxford. G. R. GIRDLESTONE.

to suggest that the observations in his letter should not be invested with the authority of his medical status.

Bradford. G. W. THEOBALD.

SIR,—The Christian doctrine states that God made man, *the highest of all living creatures*, in His image; and because of this He gave man some of His attributes, one of which is freedom of will. Man may practise virtue or vice as he chooses. He may select deliberately (not by instinct) and follow any line of action from among many. If man chooses to make a Buchenwald or an Auschwitz, God will not interfere. To do so would be to destroy free will, and man would no longer be the image of God.

However, God earnestly desires man to do only right and good. It is untrue to say that "because I have within me an instinctive knowledge of right and wrong, it must have been given me by God." There is no such instinctive knowledge. We must deliberately separate right from wrong from the moment we leave the womb until our last breath expires. To guide us, we have the Christian doctrine and ethic, the Testaments, and the Gospels. We have an example in the life of Jesus Christ, whom we believe to be God come to this earth. God desires that we shall follow this rule and example, and recognise the gifts He has given us in private prayer and public worship, and He will strengthen our resolve with the Sacraments. We may choose, however, as we wish and follow whatever path we desire whether good or evil. It is a decision we must constantly make and remake all the days of our life.

"The inner satisfaction of doing right" can only come to those who know what right is. The only yardstick we have is the Christian code. To follow the Christian code is to follow Christ. "Ye that are not with me are against me." There can be no halfway house and no standing aside. It is as simple and as difficult as that.

I do not know whether leukæmia and nephritis are examples of evil. No doubt there are some who would say that they are. It would be valuable to have enlightenment on this point.

Richmond, Surrey. J. C. HARLAND.

SIR,—The tone of Professor Platt's letter, breathing a great love for his fellow-men and a desire not to hurt the religious susceptibilities of others, suggests that he is far from being an atheist. None the less, by finding it impossible to believe that God is omniscient, omnipotent, and wholly benevolent, he is by this limitation of His perfections, denying His existence.

There is no point in the comparison he makes of students questioning his decisions and his own criticism of the Almighty. He and his students are finite beings, while between himself and his Creator there is the gap of infinity. A better example of the same order is provided by Lambert.

> "A boy stood near the railway gazing philosophically at a passing train. A burning cinder from the smoke-stack struck him in the eye. He mused on the incident in this way. 'For me it is hard to see what design or plan this great Corporation could have had in spending vast sums of money to throw that cinder in my eye. *It is somewhat difficult to discern design or benevolence in it.*'"

A doctor at his best can give little assistance to his patients if he only knows what they are made of. To help them fully—that is to enable them to achieve their destiny—he must know what they are made for.

A reasonable conclusion to arrive at is as follows. God *is* a fact. Suffering is a fact. We do not fully comprehend why God should have permitted suffering nor how He adjusts *compensations* which seem to be required if justice is to prevail. But that we do not fully comprehend these things does not surprise us there are thousands of lesser problems than this we have failed to solve. We are not going to what is certain and maintain that our finite intellig ought to be able to comprehend everytning—a com hension the possibility of which experience absol denies.

It would be well to remember that the symbol *Christianity is a cross!*

Wolverhampton. PATRICK E. CARROLL.

SIR,—I believe that we, as a profession, are at ris *that* our life-long scientific training may *fail* to fit us weighing evidence of a different sort—the historical are apt to regard it as less factual than the findings of own researches. It will be noted that Professor P not once in his letter refers to the personal figure Jesus Christ: most Christians would agree that "Ch tianity without Christ" can make no sense at all to impartial inquirer. But if the historical evidence weighed, and the New Testament be evaluated in *light, men of science may find it more* than "unsa *table* hypothesis." Instead of straining "to believe to us is incredible" they may find their reason accep the catastrophic historic event of Christianity, with follows from it. To us as a profession it may be of inte that Luke, a man of our own discipline, became intimate historian of the origins of Christianity. Mod historians have borne tribute to the precision of his w It was given to a doctor to trace the records of the sup natural in history, which Christians take as authe cating the supernatural in doctrine and belief.

Professor Platt finds an insuperable obstacle to Ch tian belief in the facts of our daily clinical experience children dying of leukæmia or nephritis. *This* obs might well balk us if physical death were the end of But the Christian expectation is far otherwise. objection stands or falls with the materialist philoso which underlies it, yet without yielding an alterna solution for the *problem of pain*. Christians respect ev the tragedy of life, giving thanks that "all our joy touched with pain . . . so that earth's bliss may be guide, and not our chain."

Then *Professor Platt* sees *no* alternative betw agnosticism and a preposterous belief in Divine co vance at the evil of Buchenwald and Auschwitz. this oversimplification ignores human responsibility the right use of free will. concerning *which* Christia makes positive affirmations. If, in face of the ph sophical problems involved, free will be *abandoned* fo stark determinism, then whence shall the agnostic doc derive his ethical foundations? What would be meaning of "a sense of personal responsibility," "rig "truth"? Despite the stoic dignity of the agno stand, his security in assuming it may be questio "We have probably almost exhausted the moral ca we have inherited from Christian ancestors wh theological beliefs we now feel free to *reject*."[1] *concept* of a man's conscience, unilluminated by a hig authority, may be challenged as too subjective for creed of a *doctor*.

A suggestion in Professor Platt's closing paragra would have been vigorously *repudiated* by St. Paul namely, that religious faith may be allowable for its val to those who seek comfort. "*If* in this life only we ha hope in Christ, we are of all men most miserable."

Doncaster. CEDRIC C. HARVEY.

SIR,—Dr. Platt's consistent and *clear-hearted* let stimulated by the Archbishop's essay, was a joy to m It is because I do not subscribe to Dr. Platt's philoso ed under a national service. This amounted to considerable sum.

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[1] *Citizens Growing Up.* Ministry of Education pamphlet, 19 no. 16; p. 10.

subsidies were a delicate and difficult subject. ennell suggested that certain essential foodstuffs, , say, wheat, meat, and certain fats might continue subsidy at approximately the present rate; but e subsidy could be diminished for other foodstuffs. ould lead to a rise in prices and a reduction in ges.

ying to the debate for the Government, Lord HAM, Minister of Civil Aviation, said the Labour and other Parties had not devised and operated eat social services merely because they wanted r to win a reputation as Santa Claus. A tremendous idealism and hard work had gone to the creation e services.

Opposition amendment was carried by 116 votes

Nurses Bill

he House of Commons on Nov. 4 this Bill was ered on report. A new clause moved by Mr. nsop, parliamentary secretary to the Ministry of , to impose penalties on persons who falsely nted themselves as being included in the list of kept under section 18 of the 1943 Act, was read nd time and added to the Bill. The report stage ncluded and the Bill was read the third time.

QUESTION TIME

Morphine for Climbing Accidents

dron-Leader E. L. **Fleming** asked the Home Secretary s department refused the request of Mr. Wilson H. Hey, hester surgeon, that mountain rescue squads be allowed y ampoules of morphia for the speedy treatment of l climbers.—Mr. **Chuter Ede** replied: In consultation e Minister of Health I am considering whether it would sible to make arrangements, subject to suitable safe-s, for the administration of morphine to injured climbers. d not approve the arrangements which Mr. Hey has ed illegally since 1934 because they do not in my view e for adequate safeguards. Squadron-Leader **Fleming**: Wilson Hey submits to the Home Secretary another or carrying this drug would he consider it?—Mr. **Ede**: nly I will. I am anxious to meet the practical situation, annot wink at absolute defiance of the law for 15 years.

Doctors' Lists

J. F. F. **Platts-Mills** asked the Minister of Health if uld furnish a list showing the number of general practi-s with 2500, 3000, 3500, 4000, and over 4000 patients ered with them under the National Health scheme; and steps were being taken to reduce those cases where the limit of 4000 patients had been exceeded.—Mr. A. **Bevan** d: General statistics on this matter are not readily ble, but inquiries have been made of a number of An analysis of the information supplied by six different (not necessarily typical of the whole country) shows that ollowing numbers and percentages of doctors on the al lists of these areas fall into the different categories ed to by the hon. member. In compiling the statistics s engaged in partnership have been assumed each to sponsible for the average of the number of persons on partner's list, and doctors employing assistants have had lists notionally reduced by 2400 for each assistant.

e total number of doctors practising under the National th Service in the six areas concerned was 2429.

ize of list	*Number of doctors*	*Percentage of total number of doctors*
01 to 3000	323	13·3
01 to 3500	277	11·4
01 to 4000	234	9·6
er 4000	160	6·6

s there is some element of inflation in executive councils' ters, the figures in columns 2 and 3 may be higher than is ally the case. Executive councils were asked in November, , to request doctors with lists in excess of 4000 not to pt additional persons for inclusion in their lists (except tives of persons already on their lists living in the same se) until their lists had been brought within the permitted t. Executive councils generally acted on this request and e have gone further and used their discretion to require doctors to take further steps to see that their lists are brought within the limit.

Copies of Prescriptions

Mr. **William Wells** asked the Minister whether his regulations allowed British subjects who were temporarily leaving the United Kingdom to have copies of National Health Service prescriptions that they needed while overseas.—Mr. **Bevan** replied: There is nothing to prevent such persons from arranging with their doctors for copies of any prescriptions, but there is no obligation on the doctor.

Infant Mortality

Mr. **Thomas Reid** asked the Minister what was the rate of infant mortality for the latest available period and for a similar period before the war.—Mr. **Bevan** replied: The provisional figure for infant mortality in England and Wales for the third quarter of 1949 is 26 per 1000 related live births; the corresponding figure for 1938 was 42 per 1000 related live births.

Incidence of Homosexuality

Mr. J. C. **Maude** asked the Home Secretary how many male persons were prosecuted and how many convicted in the Metropolitan police area in the years 1938, 1948, and during the first nine months of 1949, of persistently importuning male persons for immoral purposes and for offences involving gross indecency; and how many of such persons received sentences of imprisonment or were fined.—Mr. **Ede** replied: In 1948, 476 persons were charged in the Metropolitan police district with importuning male persons for immoral purposes and 444 were found guilty. In the first nine months of 1949, 415 persons were charged and 392 were found guilty. In 1948, 486 persons were arrested for gross indecency between males and 211 were arrested in the first nine months of 1949. Of the 89 committed for trial in 1948, 82 were convicted, and of the 94 committed for trial in the first nine months of 1949, 77 were convicted. I regret that the other information asked for is not available.

Brigadier **Frank Medlicott**: Is the Home Secretary aware that there is a feeling that the amount of homosexuality in this country is on the increase, and that the state of the law needs to be looked into; but, more important still, is the Home Secretary considering the setting up of a committee to examine the social, medical, and moral aspects of this very grave problem?—Mr. **Ede**: It is a problem which has been present in my mind for some time, and I am considering whether it is necessary to make any formal inquiries into the possible growth of these practices.

Mr. **Maude**: Will the Minister tell me how it comes about that there are no figures available as to whether these persons were imprisoned or fined?—Mr. **Ede**: I will try to ascertain that information for the hon. and learned gentleman.

Supply of Artificial Limbs

Lord **Willoughby de Eresby** asked the Minister of Pensions what was the time now taken to supply artificial legs and artificial arms from the date of measurement and order: and the average time now taken for repairs to artificial limbs sent to the main repair centres of his department.—Mr. C. J. **Simmons** replied: The time now taken to supply limbs to patients requiring artificial legs for the first time is normally 13 weeks. The average time over all classes of patients including those requiring spare limbs is 36 weeks for legs and 30 weeks for arms. The average time taken to repair artificial limbs at the main repair centres is 8 weeks.

Replying to further questions Mr. **Simmons** said that the Ministry had given those who needed a limb to maintain their employment priority over other classes. But the making of an artificial limb was not a matter of mass production. The work was done by individual craftsmen and a number of fittings were involved so that the owner of the limb could walk without discomfort. A new factory had already started to produce artificial limbs. The demand was now declining and he thought that they had reached the peak.

As to the suction-socket limb, the Ministry wished to issue it generally only when they were satisfied that every possible improvement had been made. They had now 150 patients wearing the suction-socket limb on trial. Production of this type was much slower than of the ordinary limb, and the Ministry hesitated to impede the production of ordinary limbs too much until they were satisfied that the suction-socket limb would prove really satisfactory.

Parliament

Amending Bill in the Lords

IN the House of Lords on Nov. 1 Lord SHEPHERD moved the second reading of the National Health Service (Amendment) Bill, which has already passed through the House of Commons. After giving a survey of the provisions of the measure, he confessed that it was a somewhat disjointed Bill and not one which canvassed any wide principle or proposed any startling change. It was a minor Bill—a list of small things promised, of little difficulties to be remedied, and of frictions to be eased. It was the first of the National Health Service (Amendment) Bills, but it would not be the last. So far from apologising for introducing it so early Lord Shepherd thought it was a matter for congratulation that the Government, having found that some adjustment was required, had taken early steps to put it into effect. In the course of time as the service grew and became bedded down, the Government might have to call upon Parliament to make adjustments. In doing so, however, he believed that no attempt would be made to undermine the main principles on which the Acts were based.

Lord LLEWELLYN held that although the Bill was a minor one it did a major piece of work. He recalled that when three years ago the National Health Service Bill was discussed by their Lordships it was suggested that the partnership clauses would not work. "The difference between the House today and the last time," he continued, "is rather remarkable, in that last time the noble Lords, Lord Horder, Lord Moran, and Lord Webb-Johnson, were all here in full cry, if I may refer to those very eminent medical gentlemen in that way. Today, showing what a far better Bill this is, all three noble Lords are conspicuous by their absence." Therefore it was clear that the medical profession fully agreed with the measure. He would like the Government to inform the House whether the proposal to charge on prescriptions would be carried into effect in this Bill or in some other measure. He would also ask if the Government would extend the exemption which was to be accorded to old-age pensioners to the disabled ex-Serviceman who needed medical supplies for his actual disablement.

Lord CLYDESMUIR had heard that there was some anxiety among specialists in Scotland as to whether clause 12, which provided that regulations should not require specialists to be employed full time, was watertight. A case had been instanced to him of a Scottish hospital in which as a result of administrative action, by advertisement, the door was closed to anything but full-time employment of specialists. Lord SALTOUN asked whether clause 24 (enabling children under 16 in Scotland to be treated, on the initiative of parents or guardians, as voluntary patients in mental hospitals) would not interfere with a boy's rights according to the common law of Scotland. In Scotland, he pointed out, a boy of 14 is considered capable of carrying on his affairs.

The Earl of CORK AND ORRERY suggested it should be arranged for the patient to pay the proposed new tax on his first visit to the doctor. That would limit the number of people going to see the doctor in the first place and thereby cut down the mob in the waiting-rooms. It would also obviate the need for the doctor to go on prescribing coloured water and reduce the number of old women sitting talking and making a great noise when probably all they needed was a Beecham's pill.

Lord KERSHAW, replying to the debate, was unable to say whether the one-shilling charge would be brought into this Bill, but the matter was under consideration. The Government agreed that it should be dealt with promptly. The exemption of disabled ex-Servicemen would be considered sympathetically.

Food Hygiene

In the House of Commons on Oct. 31, on the motion for the adjournment, Mr. T. C. SKEFFINGTON-LODGE pointed out that 3270 outbreaks of food-poisoning were reported between 1938 and 1947. In 1938 there were 156; last year 904. Between 1937 and 1918 no than 246 deaths were recorded. Since the war had been a phenomenal growth in community and two hot summers had exposed many wea the food front. Was the Minister satisfied that, the housewife is not yet free to pick and choose, powers of inspection available under the Food Drugs Act were being applied rigorously enough himself believed that the law was adequate but enforcement often was not. The cause of "po was still a mystery—it might well turn out to be borne—all the more reason to look at the subj flies surrounding our food. The range of places in slovenly habits created danger extended from homes to luxury hotels. British standards of were bad and the model by-laws recently issued Ministry, although containing excellent tions, made no reference to smoking and the be safeguards fell short of what was really required

Dr. EDITH SUMMERSKILL, parliamentary secreta the Ministry of Food, said that the people of the cou did not seem to realise that it was for them to de new standards of hygiene and that the cure lay in own hands. She reminded the House, however, until 1938 food-poisoning had not been a noti disease; and only since then had the public-h laboratories supplying data on this subject incre from 12 to 50. Thus the country was today m conscious of food-poisoning. Finally, she urged ho wives not to tolerate standards of cleanliness in a cater establishment that they would not tolerate in th own households. They must have the moral courag make a protest and not go to the place again.

Social Services and Economic Policy

In the House of Lords on Nov. 2 and 3 a de took place on the Government's proposals to deal the economic situation. Viscount ADDISON, Lord P Seal, moved a resolution approving the lines of described in the Prime Minister's statement on Oct and Viscount SWINTON, for the Opposition peers, mo an amendment criticising the Government's plan inadequate.

Lord RENNELL said it was obvious that if there to be a substantial all-round economy on the th we were our own masters to economise in it, must c from social services and food subsidies. The recogn that some of these services had to contribute somet to our economies was shown by the imposition of a amount on prescriptions under the National H Service Acts. From the report on the operation of National Health Services which was made on Oc it appeared to Lord Rennell that there were a nu of other economies which could be made there, which would be both profitable and perhaps not burdensome. Last year 187 million prescriptions been dispensed which at a shilling each was approxima the £10 million referred to as an economy. Of co the economy might turn out to be greater because new charge might lead to fewer prescriptions issued. The number of spectacles supplied and pai last year was 5¼ million, and spectacles on numbered 3 million. It had been stated recently reply to a parliamentary question that the estim number of spectacles to be supplied in the coming was 9 million. Lord Rennell suggested that a contr tion of 10s. per pair of spectacles would not be out place. The same sort of contribution might be den from other sources. One figure contained in the rep was of great importance. Hospital-bed accommodati was given as 450,000 beds net. Assuming a 60% be occupation, 1s. a day for the occupation of a bed wo produce something of the order of £5 million, and would produce the best part of £10 million. It see to Lord Rennell that under the National Health sche savings or contributions of the order of £25 million wo not be impossible or burdensome, more especially if t reduced the admittedly unnecessary demands which being made in a great many cases. No reference was m to the number of outpatients' visits to hospitals, which the bad old days of voluntary hospitals provided a so of revenue which might have been slightly be

bert Bolam. who had been chairman of business
.932. But Bolam died early in the year and
was elected in November. He proved himself
ellent choice—partly perhaps because he enjoyed
h of the work. He regarded his office as the most
sible to which any medical practitioner can aspire.
quite the most pleasurable."

e presides over a body of men who are quite dis-
ed in their collective capacity. and whose sole aim is
tection of the public and the standard of the medical
on both in education and conduct. Towards their
nt they are indulgent and loyal. and he on his part
wise should realise that he is only *primus inter pares*
no means a dictator."

he hearing of disciplinary cases his manner may
een forbidding. but when decisions were being
l he was lenient. and very conscious of what a
owes to the Grace of God. With that thought
d he avoided as far as possible any high moral
to practitioners summoned before the council.
period of office. now unhappily cut short. was
problems. including alterations in the medical
lum (on which a report was issued in 1947). the
ation of foreign doctors. and the proposed reforms
are embodied in a draft Medical Bill. In all this
ie won the admiration of his associates: and it
president of the General Medical Council that he
d his full stature.

* * *

bert Lightfoot Eason was born in 1874. the third
E. H. P. Eason. During a serious childhood illness
mes Goodhart despaired of his recovery. but later
house-physician Eason was able to demonstrate
danger of dogmatic prophecy in medicine." In
he entered University College and in 1898 he
ed from Guy's. Here as a house-officer he came in
ontact with Sir Cooper Perry and it was on Perry's
that he chose ophthalmology as his specialty so
e might have time to devote to his other interest
inistration. He took his M.D. in 1901 and his M.S.
2. In the following years he was appointed warden
residential college and dean of the medical school
y's, and in 1905 he joined the staff as assistant
almic surgeon. During the 1914–18 war. at the
tion of the War Office, he went to the Middle East
sulting ophthalmic surgeon. and here he had the
tunity of forming a friendship with Allenby. whom
er described as "one of the few really great men
have met in my life." In 1917 he was appointed
and in 1919 C.B. In 1936 the Royal College of Sur-
elected him to their fellowship and in 1938 he was
d an honorary master of the bench of the Inner
le. He was knighted in 1943.

wide knowledge and experience of the problems
ministration and of education gained in the con-
s of the University of London and of the General
al Council were recognised by his appointment to
epartmental committee of the Ministry of Health
stgraduate medical education. and later he became
mber of the governing body of the Postgraduate
al School of London, of the hospitals. and medical
es committee of the London County Council. of
ieneral Nursing Council. and of the general council
ng Edward's Hospital Fund.

Herbert Eason died in Guy's Hospital on Nov. 2.
is first wife. who died in 1917. he leaves a daughter.
econd wife. formerly Miss Margaret Wallace, survives
with two daughters.

JOSEPH CORBETT MUIR

M.D. Camb.

E death took place on Oct. 29 of Dr. J. C. Muir.
for almost a quarter of a century was medical
intendent of Whipps Cross Hosptial.

seph Corbett Muir was born in 1872 and was
ated at the Leys School. Cambridge, and the
ersities of Cambridge and Manchester. He graduated
ambridge in 1897 and proceeded to the M.D. in 1901.
r holding various hospital appointments in
chester, he joined the staff of Plaistow Fever
pital. where he worked under Biernacki.

In 1908 he was appointed medical superintendent of Whipps Cross Hospital. where he remained until August. 1932. except for the years between 1915 and 1919. when he served with the R.A.M.C., and was for some time a prisoner-of-war in Germany.

Whipps Cross Hospital had only been open for some five years when Muir joined the staff, and its development into a busy. modern. and well-equipped general hospital is largely due to the advice which he tendered to the former West Ham board of guardians.

Muir was a man of strong personality. whose work was devoted to improving the conditions of the patients under his care. He was known as a strict disciplinarian. but nevertheless was very attentive in dealing with any problems concerning members of the hospital staff. many of whom appreciate the help that he gave them in difficulty. He was regarded by his colleagues as a practitioner of outstanding merit. and members of the consulting staff always paid considerable attention to his opinion on a difficult case. As a hospital administrator he was widely known throughout the country. and for a time he was president of the Medical Superintendents' Society. A keen sportsman, he played tennis for both Essex and Gloucestershire. and he had a very low golf handicap.

Ill health caused Dr. Muir to retire in 1932. and he had been living at Box. in Gloucestershire. He closely identified himself with the life of the district and was a member of the Stroud rural district council. His wife survives him.

RICHARD LAKE

F.R.C.S.

Mr. Richard Lake. consulting surgeon for diseases of the ear. nose, and throat to University College Hospital. died in Bristol on Nov. 3 at the age of 87.

The son of Thomas Lake. of Cheeke Court. Sittingbourne, Kent. he received his medical training at St. Thomas's Hospital. London. where he took the Conjoint qualification in 1885. The same year he took part in the Sudan campaign as a surgeon with the National Aid Society (the forerunner of the British Red Cross). For his services in the Serbo-Bulgarian war he was decorated by both sides, receiving the order of the Red Cross of Bulgaria and the fourth class of the Order of St. Sava of Serbia. After postgraduate study in Vienna he returned to England to specialise in otolaryngology and in 1887 he was appointed laryngologist to the Mount Vernon Hospital for Consumption. and soon afterwards to the staff of the Royal Ear Hospital, which later was associated with University College Hospital. He also joined the staff of the Seamen's Hospital, Greenwich. In 1890 he took his F.R.C.S.

From 1924 to 1928 he held the Geoffrey E. Duveen lectureship in otology in the University of London. and he also lectured at the Medical Graduates College and at the London School of Clinical Medicine. In 1907 he presided over the West London Medical Chirurgical Society. and in 1913 he was president of the otological section of the Royal Society of Medicine. For some years he was a coeditor of the *Journal of Laryngology* and his own writings included *Laryngeal Phthisis, Contributions to the Art and Science of Otology.* and (with E. A. Peters) a *Handbook of Diseases of the Ear* which reached five editions. He retired from University College Hospital in 1926.

Mr. Lake was especially interested in the re-education of the deaf. He considered that instrumental re-education is almost useless in acquired deafness of adults but most useful in congenital deafness and also of value in some cases of acquired deafness in children, to whom he gave devotion and skill. One of these congenitally deaf people "who showed signs of hearing after six months of untiring patience on his part" writes: "I see him clearly in his consulting-room in Harley Street, full of fun. generosity. and with an amazing fount of sympathy for those suffering from the handicap of deafness. He was full of inspiration and encouragement for he believed always that most deaf-born children had some residual hearing. All deaf-born and hard-of-hearing children are in Mr. Lake's debt for his pioneer work

Obituary

HERBERT LIGHTFOOT EASON

KT., C.B., C.M.G., M.D., M.S. LOND., F.R.C.S.

Sir Herbert Eason held office as medical superintendent of Guy's Hospital, as principal of the University of London, and as president of the General Medical Council. He filled each of these honourable positions after many years of devoted and loyal work for the institutions over which he was called to preside, and the following notes describe these three channels of service through which so much of his ability and energy were directed.

* * *

In 1920 Herbert Eason succeeded as superintendent of Guy's Hospital the late Sir Cooper Perry, who in 28 years of office had justly earned for himself an enviable reputation as a wise and able administrator. It was no easy task to follow such an one, but Eason had always had a tremendous admiration for the older man, both as an administrator and as a scholar, and he had taken advantage of every opportunity to study his methods. As the chief administrative officer of the hospital, the superintendent had nominal charge of all the individual departments, and Eason made it a point of honour to become thoroughly familiar with the routine and the personnel of every one of them. Throughout his period in office he paid a weekly visit to each ward and to each department, and there was no hospital activity, regular or irregular, of which his knowledge was not first-hand. It was said of him, with truth, that no-one could be more scathing in condemnation of careless or ill-done work and no one more generous in praise of work well done. During his tenure of office every official ceremony went off smoothly and without hitch, for he had always taken infinite pains to ensure the inevitable success and he had a real flair for this form of organisation.

[Walter Stoneman

He was a regular attender at the monthly meeting of the medical committee, and when, as sometimes happened, a discussion became discursive and threatened to become interminable, he would draft a resolution that covered the whole matter and satisfied everyone. A very clear thinker, he possessed such a quick brain that he was a great asset on any committee. As superintendent, he was accepted by both parties as the normal channel of communication between the court of governors and the visiting staff of the hospital, and he always regarded it as his most important duty to familiarise himself with the point of view of his medical colleagues and to represent it clearly and cogently to the court. His memoranda were models of their kind, lucidly expressed in perfect English, and it is not surprising if he was intolerant of badly worded and obscure compositions.

In his workaday office he was always readily accessible, alike to his colleagues on the staff and to subordinate officers of the hospital, and, even though he might not always be sympathetic to their case, everyone who approached him felt that he had had a fair hearing.

Eason was an accepted authority on the history of Guy's and he had an intimate knowledge of the place, its records, its traditions, and its atmosphere. To dine with him and his wife in the beautiful Georgian treasurers' house—destroyed in 1941—and to hear him expatiate on the portraits and pictures that adorned the walls of the governors' dining-room and the antique furniture which graced it created a lasting impression on the mind of many a young man in his house-officer days.

No man ever served a hospital more ably or more loyally, or loved it more. At the time of his retirement from office he himself said that he "valued " much as the goodwill of his fellow officers and and that he had enjoyed in abundance.

T.

I first entered the service of the University of in 1924. Eason was well established in the top of the hierarchy charged with the direction of university's affairs. He had already been chairman the academic council, but at the time of my had switched over to the chairmanship of the fi committee of the senate. Among my new masters, was the first of many to show me real friendliness— that friendliness developed into warm friendship. F the outset, he placed freely, but unobtrusively, at disposal of the raw novice the wisdom derived f experience and from an unusually alert intelligence. work together was interrupted he was invited to serve on departmental committee from recommendations the present stitution of the University of Lo derives. During this interim p he remained on the senate but on none of its committees senate membership lasted, in for 30 years.

Eason was a true Londoner his devotion to the university of his youth and his maturity probably one of the deepest loyal with which he was inspired. would be interesting to k whether he experienced gre satisfaction when, emerging f the tutelage of Cooper Perry, became superintendent of Guy's when, after a not too easy pa he became vice-chancellor of university. As vice-chancellor was at his best—and that best first-rate. Academically he was unduly adventurous, but he receptive of sound advice. public occasions he spoke well to the point. He never bored audience. Generally when he finished they would have liked more. No-one could quicker than he in solving practical problems—as example the planning and execution of the full we centenary festivities, attended by representatives universities and learned societies from all quarters the globe.

The last stage of his university career came at end of his term of office as vice-chancellor when in he was appointed principal in succession to Edwin De This change from the highest post, except for that chancellor, which the university has to offer, to that chief administrative officer was not an easy transiti But Eason, whose critical faculties were never allowed decay from disuse, and whose faults were rather f right than tortuous, effected it with success. And be principal of the University of London when evacu threatened disintegration of the whole machinery administration was no enviable task.

H. C

In 1925 Eason was elected the representative of University of London on the General Medical Cou over which Sir Donald MacAlister then presided. entered it, he relates, with considerable trepidati but it was not long before he found himself at home.

"There is in medicine," he wrote, "no society compar with an Inn, except the General Medical Council. The coun of the Royal Colleges of [illegible] are attra societies, but their const[illegible] re limited their particular branch of the profession. The General Medi Council, on the other hand, consists of the picked bra every branch of medicine, collected from every part of United Kingdom and Eire. They sit together all day du the session, lunch together, deliberate, and argue to in an atmosphere of cameraderie and good fellowship."

It was expected that when Sir Norman Walker reti from the presidency in 1939, he would be succeeded by oyal College of Physicians or the Glasgow Hunterian 1. Mr. Keynes notes that "all the portraits of are those of an old man, and there cannot be much e in the ages at which they were done." But after vey was 79 when he died; the two portraits Mr. accepts might well be of a man in his sixties, but f one getting on for eighty. There was time, after e painted, for him to be done again.

inating companion study would be the pursuit of s hands. Leaving aside the delicate ringed hand of ge of Physicians portrait—probably idealised or even gly invented by the painter—his hands are shown in gow portrait as strong, grooved, elderly (but not hands. How do these compare for age with the hands Ditchingham picture? Mr. Keynes, who has seen th, could tell us.

OST OF HOSPITAL ADMINISTRATION

tempting to ascribe any fresh increase in hospital the expense of a more lavish administrative machinery he N.H.S.; but the Minister of Health [1] has lately that the cost of administration accounts for only of total expenses; and he has declared that adminis- is "streamlined." In a report on the Bromley group, Mr. R. C. Millward, secretary of the manage- ommittee, gives the following figures for staff on l this year:

Department	*Total*		*% of total*	
ative ..		23		1·27
al	53		2 95	
ıg	654		36·23	
atory	24		1·34	
	13		0·72	
otherapy	38		2·11	
acy	9		0·49	
service	15		0·84	
		806		44·68
c	745		41·34	
	84		4·66	
		829		46·00
ance and transport		39		2·22
(serving all departments)		105		5·83
		1802		100·00

figures are exclusive of specialist medical staff. The figures estic workers include a number engaged part-time, while for nurses falls short by about 30 of the number desired for s at present open.

aff in other areas is in about the same proportions, it saving in the cost of administration can be expected nanagement-committee level: there may still be some nous administrators in our hospitals; but it seems e emergence into the management-committee's offices s and others who formerly worked unseen in the local ity's medical division gives a faulty impression of xuberance of numbers.

ESTIMATES OF FUTURE BIRTHS

he return of births and deaths for the week ended 9, the Registrar-General estimates that in England ales live births will number 171,000 in the quarter Dec. 31, 1949, and 186,000 in the quarter ending 31, 1950, making a total of 357,000 for the six months. six months ended March 31 this year live births totalled 4.

A MEETING ON MEDICAL LIBRARIES

of the results of the National Health Service Act has a great expansion in the provision of library services pitals. In this connexion hospital authorities are faced many problems and there is urgent need for help and nce, especially in the selection of medical books and licals. A memorandum by a special committee of edical section of the Library Association appeared in our ns on Sept. 3, and has now been published by the iation as a pamphlet, "Medical Libraries in Hospitals"; k-list has also been compiled. Requests for these have received from hospital authorities in Great Britain, a, Australia, Canada, Germany, Malaya, and the United s of America. Many correspondents have asked for er advice and for book-lists on specific subjects.

view of this demand and of the widespread interest which w being taken in hospital libraries, a special meeting he medical section of the association will be held at cer House, Malet Place, Bloomsbury, London, W.C.1, on Friday, Dec. 16, at 7 P.M., at which medical libraries in hospitals will be discussed. Members of the committee responsible for compiling pamphlet and book-list will endeavour to answer questions. Hospital authorities, doctors, and members of the Library Association are invited to attend.

A POET OF MENTAL ILLNESS

CLINICAL pictures are hard to paint in words, harder still in verse; yet Gustavo Augusto de Rezende, in a work [1] which has only lately reached us, has made the attempt, choosing the insanities as his theme. It is difficult to call the following English words poetry:

> "The arteries in sinuous curves
> Are hard and tense and of strong amplitude."

But almost the same words in Portuguese, and in almost the same order, fall rhythmically into lines which are both sonorous and metrical and achieve a sense of poetry without the embellishment of romantic metaphors and similes. The reason perhaps is that Portuguese verse is vastly different from English. Of these forty short poems, none of which exceeds fourteen lines, about thirty are clinical pictures of different forms of mental affliction, including schizophrenia, paraphrenia, erotomania, melancholia, mania, senile dementia, presenile dementia, general paralysis, heredosyphilis, cerebral syphilis, epilepsy, hysteria, neurasthenia, psychasthenia, chorea, epidemic encephalitis, constitutional psychopathy, idiocy, &c. One poem is called "Collective Psychosis (War)." The last poem in the book tells the reader (still in fourteen lines) how to avoid insanity. But it would take a Horace to turn out gems of poetry on these themes.

MEETING OF JOINT NUTRITION COMMITTEE

AN expert committee on nutrition, set up jointly by the Food and Agriculture Organisation and the World Health Organisation, held its first session in Geneva between Oct. 24 and 28, under the chairmanship of Lord Horder, adviser to the Ministry of Food. In some goitrous areas locally produced salt is not easily iodised; and the committee recommended that other methods of supplying prophylactic doses of iodine should be devised. Among the committee's further recommendations was one concerning the establishment of an international code of analytical methods for the determination of vitamins in foodstuffs.

BRITISH AND NEW ZEALAND MORTALITY

A RECENT study [2] shows that the expectation of life in New Zealand is considerably higher than in England and Wales. New Zealand mortality-rates are much more favourable than those for England and Wales in respect of most age-specific causes of death, with the greatest differences in the younger age-groups; "and from the figures . . . for infant mortality by social class it is clear that lower mortality rates can be achieved in England and Wales with better nursing, feeding, and infant care."

SCOTTISH DEFENCE UNION

THE annual report of the Medical and Dental Defence Union of Scotland shows that in the year ended Aug. 8, the membership increased by 204 to a total of 6300. The union's financial position is strong, with a reserve of £6 6s. 8d. per member. The past year, says the report, has brought no signs of any decrease in the number of claims made by patients alleging negligence in diagnosis or treatment; and the number of such claims against dental members has increased substantially.

The report offers advice to doctors who are asked by solicitors and others acting for third parties to give information and reports on their patients. No information or report should be given without the written consent of the patient, or, if the patient is dead, of the nearest relative or the legal representative. If called as a witness in a criminal case, a practitioner must obey the summons. In a civil case, if served with a summons or subpœna accompanied by conduct money, he must also attend court. If, before attending court, he has not obtained the written consent of his patient or representative to give evidence, he should appeal to the judge, who will direct him to answer questions only if he considers this necessary in the interests of justice.

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[1] See *Lancet*, Oct. 15, p. 710.

[1] Tristezas do Manicomio. Rio de Janeiro. 1941. Pp. 94.

[2] Lessof, E. *Population Studies*, 1949, 3, 76.

and many will join their thoughts with mine in this tribute."

"Apart from his professional career," writes G. E. D., "Lake was a man of many parts. It was most interesting to hear of his adventures in the Sudan Campaign at the front and at the base in Suakin, where the medical equipment and service was so primitive when compared with modern times. As a fisherman he was supreme—a real master of the gentle art. His knowledge of salmon and trout fishing was profound and his studies on the grayling bore fruit in a most interesting book. He was in every sense a gourmet and an epicure in his knowledge of good food and wines. A brilliant conversationalist, he possessed a keen sense of humour—though he was frank and outspoken to all with whom he came in contact, he was never influenced by any motive except that of doing his duty in giving his counsel and advice. He had no use for 'isms' and State control. He deplored class hatred which he both disliked and feared. All who had his friendship will miss him greatly."

By his marriage to Miss Mildred Pelly he had a daughter. In 1918 he married, as his second wife, Ellen, daughter of Mr. George Sapsworth.

Appointments

ASHBY, M. G. C., M.A., B.M. Oxfd, M.R.C.P.: physician, Archway group of hospitals.
BELAM, O. H., M.R.C.S., D.A.: anæsthetist, Archway group of hospitals.
BRENTNALL, G. C., M.D. Lond., M.R.C.O.G.: gynæcologist, Luton hospitals.
CLARKE, S. H. C., F.R.C.S.: surgeon, Luton hospitals.
ERSKINE, J. P., M.B., B.SC. Glasg., M.R.C.O.G.: obstetrician and gynæcologist, Paddington Hospital.
FAGG, C. G., M.D. Lond., M.R.C.P., D.C.H.: pædiatrician, Luton and Hitchin group of hospitals.
HINDS HOWELL, C. A., M.A., D.M. Oxfd, M.R.C.P.: physician, St. Charles' Hospital.
IVES, L. A., M.B. Lond., F.R.C.S.: surgeon, St. Charles' Hospital.
KELSALL, A. R., M.A., M.D. Camb., M.R.C.P.: physician, West Herts group of hospitals.
KORKIS, F. B., M.B. N.Z., F.R.C.S., D.L.O.: part-time ear, nose, and throat surgeon, Hillingdon Hospital.
PERRY, H. C., B.SC. Wales, M.R.C.S., M.R.C.O.G.: gynæcologist, Hillingdon Hospital.
PICTON, W. H. A., M.A., B.M. Oxfd: pathologist, Hillingdon Hospital.
RENDELL, CHRISTINE, M.B. Brist., D.A.: anæsthetist, St. Charles' Hospital.
ROBERTSON, A. I. G., M.B. Edin., D.A.: anæsthetist, Paddington Hospital.
SCOTT, J. M., O.B.E., M.B. Lond., M.R.C.O.G.: gynæcologist, Archway group of hospitals.
WYLLIE, W. G., M.D. Edin., F.R.C.P.: part-time pædiatrician, St. Charles' Hospital.
YUDKIN, SIMON, PH.D., M.B. Lond., M.R.C.P., D.C.H.: pædiatrician, Archway group of hospitals.

Births, Marriages, and Deaths

BIRTHS

BROOKS.—On Oct. 30, at Oxford, the wife of Mr. Donal Brooks, F.R.C.S.I.—a daughter.
DENT.—On Oct. 22, the wife of Dr. C. E. Dent—a daughter.
FORRESTER.—On Nov. 2, at Llanelly, Carmarthenshire, the wife of Dr. G. S. Forrester—a son.
GRYLLS.—On Nov. 2, in London, the wife of Dr. Henry Grylls—a son.
MARSH.—On Nov. 1, in Philadelphia, the wife of Dr. Kenneth Marsh—a daughter.
SCOTT.—On Oct. 31, in London, the wife of Dr. Leslie Scott—a son.
STOKER.—On Oct. 24, at Cambridge, the wife of Dr. M. G. P. Stoker—a son.

MARRIAGES

ATTWOOD—BROWN.—On Oct. 29, in Manchester, Roy Wilton Attwood, M.R.C.S., to Margaret Kathleen Brown.
UNWIN—SLACK.—On Oct. 31, at Bishopsteignton, Peter Unwin, M.C., M.B., to Marjorie Hume Slack.
WATSON—LOWIS.—On Oct. 10, at Dunleer, co. Louth, Eire, John Ernest Watson, M.B., to Margaret Sarah Lowis.

DEATHS

DAVIS.—On Nov. 5, the Rev. George Brocklesby Davis, M.A., M.D. Camb., aged 76.
EASON.—On Nov. 2, in London, Herbert Lightfoot Eason, KT., C.B., C.M.G., M.D., M.S. Lond., F.R.C.S., aged 75.
FAIRBAIRN.—On Oct. 31, in London, Donald Charles Fairbairn, M.C., M.B. Lond.
LAKE.—On Nov. 1, at Bristol, Richard Lake, F.R.C.S., aged 87.
MUIR.—On Oct. 29, at Box, Glos, Joseph Corbett Muir, M.D. Camb.
NIXON.—On Nov. 4, at Bath, John Hobart Nixon, M.D. Lond.
PRIDMORE.—On Nov. 3, at Chale, Isle of Wight, John Walter Pridmore, M.R.C.S., aged 79.
SHIPTON.—On Oct. 31, at Milford-on-Sea, Hants, William Shipton, B.A., M.D. Camb.

Notes and News

VACANCIES ON MANAGEMENT CO

AT the end of next March the term of office of third of the members of all hospital management c will expire; and these members will be eligible ment for a further term of three years. In a cir regional boards, the Ministry of Health urges that, as the committees were constituted, full consultation precede the filling of the vacancies, with a view to "a balanced membership including the appropriate typ experience and reflecting the interests of the be served"; and among the bodies to be consulted committee itself, every local health authority and exec council served by the committee, and the senior med and dental staff of each of the hospitals concerned Minister, while he sees no objection, especially on this occasion when the term of office has been short, to reappointment of a reasonable proportion of the members, considers "that Boards should not lose the advantage, on each occasion, of introducing at some new element into the membership, e.g. from Committees or from the local community. The annual rence of vacancies also offers an opportunity for rev the present composition of Committees in the light of e ence and adjusting it where desirable." In this conn the circular draws attention to the following points:

1. The proportion of professional members should not be "The Committee must essentially be and remain a group of the local community . . . and any impl is a body more likely to be concerned ff than those of the community woul

l members should normally be derive om names proposed by the hospital and not from other sources.

3. In general, officers of committees should not be appoint members of them.

4. While it may be convenient to boards to have a few of very exceptionally memb

ly iden

5. In order that the local comm it controls, regional b with the committee and the hospitals it controls, regional b should consider whether any additional organisations repr the consumer interest could usefully be consulted. It is o boards to appoint members whose names have not been put them through the machinery of consultation, but who are individually to be capable of contributing valuably to the serv

As regards casual vacancies, boards should use discretion on the question of consultation; the Act req them only to consult the committee itself.

HARVEY'S PORTRAITS

GREAT men of our day can never become as legenda their forerunners. Posterity will see for themselves cigar of a Churchill, the beard of a Shaw; and will these significant figures in action on the screen, and their voices on well-preserved sound-tracks. They will lose forever the sort of pleasure Mr. Geoffrey Keynes enj in his pursuit of William Harvey's dead face. He told story in the Thomas Vicary lecture, 1948, and it has been published, with beautifully reproduced pictures, by Royal College of Surgeons.[1] Harvey, with his cold eye, his broad high forehead, and his complexion colour of wainscot," has been much painted, but not it seems, from the life. A good market for his pictures am doctors has ensured that the pictures should always forthcoming. Mr. Keynes is severe about their origins will allow only two portraits and one bust to be genu lifelike. These are *the state* portrait in the Royal Co of Physicians, the portrait in the Hunterian *collection* of University of Glasgow, and the bust in Hemel Hemps church. He argues that the Ditchingham Hall port which shows Harvey in three-quarter length with a fringed handkerchief in his hand, may be a posthumo production, because it has lost that lift of the eyebrow wh gives a characteristic tartness and decision to the face the two authentic portraits. The average, less inform clinician, however, would be inclined to say the arre had mellowed with age; for the Harvey of the Ditching portrait—and also of the portrait in Kent and Canter Hospital, and of an etching attributed to Richard Gay —looks older (and iller) by a good ten years than the Hu

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[1] The Portraiture of William Harvey. 1949. Pp. 32 Obtainable from the college, Lincoln's Inn Fields, London, W.C

HOGENESIS OF ATHEROSCLEROSIS

J. B. DUGUID
M.D. Aberd.
ESSOR OF PATHOLOGY IN THE UNIVERSITY OF DURHAM

; long-accepted interpretation of atherosclerosis,
eroma as it used to be called, may seem satisfactory
he histological point of view, but it is not altogether
ordance with the principles of vascular physiology.
sease which so commonly affects the aorta, coronary,
al, and other medium-sized arteries, and which
pathologist constitutes one of the most familiar
nan lesions, consists, according to modern teaching,
fatty degeneration with a fibrous overgrowth of
tima. Histologically there is undoubtedly a fibrous
ning of that coat, but there is something about the
ning which makes the overgrowth interpretation
lt to accept. It is the narrowing which is so
only produced in medium-sized vessels such as the
ry arteries. When the functional activity of the
il system is taken into account it would appear
a fibrous overgrowth of the intima must cause
ing of an artery rather than narrowing.

get a true conception of the nature of arterial
e one must take functional activity into account
onsider what effects the various lesions will have
ie pulse movements of expansion and recoil.
ally, when the internal pressure in an artery
n systole its walls yield and expand, but by virtue
eir elastic recoil they are able to return to their
al dimensions when the pulse wave passes. It
us their elasticity which allows them to be
tedly expanded without becoming permanently
ded. In reference to these activities it is important
te that while the expansion is a movement imposed
e arteries by the blood-pressure, the recoil is a
on of their own elasticity; and therefore anything
reduces this property will diminish their powers of
, or, in other words, cause them to remain more
s dilated. Fibrous overgrowths, it will be agreed,
reduce their elasticity; and so, if atherosclerosis
of such a nature, it should cause the arteries to be
d rather than narrowed.

e problem is usually viewed in a somewhat different
m, it being suggested that a fibrous overgrowth by
ing an artery will help it to resist expansion. This,
ver, ignores the fact that the arteries during life
onstantly under the influence of the blood-pressure,
at any tissue growing in their walls must as it
accommodate itself to the movements imposed
at force. A fibrous overgrowth would from its
tion have to conform to the normal expansion of
essel at each systole or be torn asunder as it formed,
it therefore would not be likely to offer much
ance to that movement. It would, on the other
, by reducing the elasticity of the vessel, be likely
terfere with the recoil, and, were it to increase
initely, it would ultimately tend to fix the vessel
y in the expanded position.

om another point of view it has been contended that
rous growth may constrict an artery by a kind of
ricial contraction; but this again is contrary to
iological principles. In constricting an artery in
way the fibrous tissue would be taking the whole
ht of the pulsating blood-pressure on itself, and,
we believe that it is only by virtue of their elasticity
the arteries are able to do this without becoming
anently distended, we must assume that the
ively inelastic fibrous tissue would gradually give
r the strain. Moreover, we have the example of
rysms to show that this is a justifiable assumption.
n theoretical grounds, therefore, it is hard to see
a fibrous overgrowth could have any other effect than to widen the arteries; yet we find that the fibrous thickenings in atherosclerosis commonly narrow them almost to the point of occlusion. This apparently conflicting observation has led to the suspicion that something must be wrong with the orthodox interpretation of atherosclerosis, and that some other explanation more in accord with physiological principles is to be sought. From the study of aortic and coronary disease I am led to believe that it is the overgrowth conception which is wrong, and that the true explanation of intimal thickening is to be found in the pathology of arterial thrombosis.

THE THROMBOSIS HYPOTHESIS

In two recent publications (1946, 1948) I have shown that lesions morphologically identical with atherosclerosis can be produced by the organisation of arterial thrombi. In these publications the process was illustrated by photomicrographs, but for the present purpose it can perhaps be more simply explained by diagrams. When a thrombus forms in a coronary artery for example, it may first occlude the lumen (fig. 1), but if the individual survives it will tend to retract so that a channel is formed through which the circulation is partly restored (fig. 2). Soon the channel becomes lined with endothelium and a new lumen is thus formed, with the thrombus now lying external to it and forming as it were a part of the vessel wall (fig. 3). Organisation then follows, the subendothelial layer of fibrin on the free surface of the thrombus (fig. 3a) being transformed into fibrous tissue by what appears to be a direct metamorphosis, while around the attached surface of the thrombus (fig. 3b) a vascular zone of organisation is formed which advances into the mass, converting it into fibrous tissue. Since this new tissue is similar to, and continuous with, that of the original intima, it has the appearance of an intimal overgrowth.

In some instances a complete organisation of the mass is brought about in this way; but more often, before the process has reached the centre, fatty degeneration and sometimes softening take place, and thus the picture of atherosclerosis is produced. While these changes are in progress the new lumen under the influence of the blood-pressure gradually widens, while the thrombus shrinks and becomes moulded to the shape of the vessel wall (fig. 4), so that in the end the mass which once filled the lumen is reduced to a crescentic thickening of the intima.

It is of course obvious that atherosclerotic thickenings do not always begin with total occlusion of the arteries; but in this extreme example lies the key to the problem. The thickenings are not to be regarded as growths in the ordinary sense, nor even as products of the vessel walls, since they are actually derived from the blood. The process is almost the reverse of what has usually been pictured, for instead of there being a gradual encroachment on the lumen by an intimal growth, there is a sudden and total occlusion by a mass of blood which subsequently becomes reduced in size as the circulation is re-established. There is nothing in this interpretation which conflicts with physiological principles, because when a vessel is occluded by a thrombus such principles no longer apply. The blood-pressure is eliminated and movements cease, and it is not until the circulation is re-established that these factors again come into play. They then, as would be expected, lead to a gradual widening of the new lumen; but a long time must presumably elapse before the vessel regains its original internal diameter, and it is not to be wondered that narrowing is a common feature of the lesions.

MURAL THROMBOSIS

Most arterial thrombi do not cause total occlusion of the vessels, but merely form fibrinous deposits on the intimal surface; yet they may have the same effect

University of Cambridge

On Oct. 29 the following degrees were conferred:

M.D.—C. C. Bryson, Harry Harris, W. S. Haynes, M. S. M. Palmer, B. G. Parsons-Smith, R. V. Stone, F. W. Watkyn-Thomas.*

* By proxy.

University of London

Dr. J. H. Sheldon will give a lecture at the London School of Hygiene, Keppel Street, W.C.1, on Thursday, Dec. 1, at 5.30 P.M., on Problems of Old Age.

Royal College of Physicians of London

Prof. Norman Capon will deliver the Charles West lecture on Tuesday, Nov. 22, at 5 P.M., at the college, Pall Mall East, S.W.1. He is to speak on Development and Behaviour in Childhood.

Royal College of Surgeons of England

The college is arranging, jointly with the Institute of Laryngology and Otology, a series of lectures. The first will be given at the college, Lincoln's Inn Fields, London, W.C.2, on Dec. 1, by Prof. Geoffrey Jefferson, F.R.S., who is to speak on Intracranial Abscess. The lecture is open to all doctors.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Nov. 1 with Dr. W. D. D. Small, the president, in the chair, a diploma of fellowship was granted to Dr. J. J. R. Duthie (Edinburgh). Diplomas of membership were also granted to the following:

J. H. Wright, W. H. Jopling, T. S. Row, P. C. Mitchell, R. W. Crocket, R. B. Baird, W. H. Perry, J. E. A. Bartlet, D. A. Gordon, R. F. Maggs, H. N. Singh, P. C. Bhattacharjee, W. D. Munro, B. Mukharji, G. I. Robertson, W. J. Weston, M. W. M. Hadley M. J. Murray, K. S. Millingen, J. H. Phowalla, K. R. Keay, D. F Gibbs, A. M. Rudolph, Mary D. Smith.

Royal College of Physicians of Ireland

On Nov. 4 the following were admitted to the membership:

W. G. Keane, D. J. O'Callaghan, I. B. Patwari, O. P. D. Ryan.

Middlesex County Medical Society

A meeting of this society will be held at Clare Hall Hospital, South Mimms, Barnet, on Wednesday, Nov. 16, at 3 P.M.

Oxford Regional Hospital Board

Dr. J. O. F. Davies, deputy senior administrative medical officer to the North West Metropolitan regional hospital board, has been appointed senior administrative medical officer to the Oxford regional hospital board in succession to the late Dr. G. C. Williams.

Long-term Medical Certificates

The National Insurance Advisory Committee have approved the draft regulations extending the maximum intervals at which medical certificates may be given in prolonged illness from 8 weeks to 13 weeks, even though the patient is seen by the doctor at more frequent intervals. These facilities have been made available by provisional regulations since Aug. 4 last (*Lancet*, Aug. 6, p. 262), but it is thought that not all doctors are yet fully aware of them, possibly because of a mistaken impression that certificates for 13 weeks cannot be given until new forms have been issued. The ordinary forms Med. 3 should be used for 13 week-certificates for the time being.

British Standards

The British Standards *Institution* has published the first issue of a sectional list of British standards relating to hospital equipment (P.D. 960). Copies may be had from the sales department, 24, Victoria Street, London, S.W.1.

The new standard for stretchers, stretcher-carriers, and hospital trolleys (B.S. *896/1949*) is a revision of a war emergency standard, published in 1940. The revised standard provides that all ambulances shall accommodate standard 7 ft. 9 in. stretchers; but this requirement need not interfere with the use of non-standard 6 ft. stretchers for special requirements. The specifications for stretchers conform with the recommendations in the manual of the International Red Cross. Preference is expressed for securing stretchers in ambulances by straps riveted to the stretcher-carriers, rather than by special locking devices. Copies of the standard (price 1*s.* 6*d.*) may be had from the sales department.

Diary of the Week

NOV. 13 TO 19

Monday, 14th

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. R. Bodley Scott, Dr. R. B. Terry: Biopsies.

Tuesday, 15th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. Donald Hunter: Devices for the I Worker Against Injury and Disease. (Erne-line lecture.)
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (I London, Ducane W. Radiotherapy in me
INSTITUTE O V.C.2
5 P.M. D
EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Mr. Jones: Family Service Units for Problem F
ROYAL PHOTOGRAPHIC SOCIETY, 16, Princes Gate, S.W.7
7 P.M. *Medical Group.* Mr. E. V. Willmott, F.R.P.S.: ance of Quality in Medical Photography.

Wednesday, 16th

INSTITUTE OF DERMATOLOGY,
5 P.M. Dr. C. W. McKenny: *X-ray Technique.*
HARVEIAN SOCIETY
8.15 P.M. (26, Dr. Wilfrid Œsophage
NORTH-EAST LONDON) Film
8 P.M. (Prince of discussion on 25, P
ROYAL INSTITUTE OF Place, W.1
3.30 P.M. Dr. J. J. O'Dwyer: Hygiene in the Factory.

Thursday, 17th

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE
7.30 P.M. (London School of Hygiene, Keppel Street, W Laboratory meeting.
WESTMINSTER HOSPITA S.W.1
5.30 P.M. (Meyerste *Clinico-path* demonstration stica and on M
ST. GEORGE'S HOSPITA W.1
4.30 P.M. Dr. Denis ecture-demons

Friday, 18th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Anne Street, W.1
NOON.
3 P.M.
5 P.M.
FACULTY OF RADIOLOGISTS
2.15 P.M. (Royal College of Surgeons.) *Therapy Section.* Dr Gray: Modern Conceptions of a Dosage Unit for therapy.
INSTITUTE OF *LARYNGOLOGY AND* OTOLOGY, 330, Gray's Inn W.C.1
4.30 P.M. Prof. Geoffrey Jefferson, F.R.S.: Acoustic Neuro
MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9
5 P.M. *Clinical* demonstration
EMPIRE ick Friars Lane, E.C.4
4.30 *Advances in the Tr* (Opening a week-end graduate course.)
BRITISH
3.15 P .1.) *Presidential addr* Future. Dr. Andrew M laya. Dr. Brian Thom tern Samoa.
WEST LO *SOCIETY*
7.30 P.M. (South Kensington Hotel, 41, Queen's Gate T S.W.7.) Dr. W. S. C. Copeman: Story of Cortiso
UNIVERSITY OF DURHAM
5.15 P.M. (Royal Victoria Infirmary, Newcastle-on-T Dr. Arthur Hughes: Study of the Living Cell. (E ford Morison lecture.)

Saturday, 19th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
9.45 A.M. Dr. Stanley Way: *Carcinoma of the Female G* Tract.
11.30 A.M. Prof. C. H. G. Macafee: Hydramnios.

Mr. Arthur Miller, surgeon in charge of the ear, no throat department of the French Hospital, *London*, has awarded the medaille de vermeil de la Reconna française.

Mr. St. John Buxton is to leave for Athens on Nov. 1 advise the Coördinating *Committee* of the Greek Reco Programme on reablement questions, and to lecture orthopædic surgery.

er dealing with the inflammatory lesions of the es, Rokitansky refers to an

> *essive deposition of the lining membrane of the vessels.* . . . highly developed form of this affection, we find the surface of a large artery, as the aorta, covered with a n substance spread over it at separate points, or in large es, and forming a stratum varying in thickness, by the inner surface of the vessel is commonly rendered n. . . . It varies in thickness . . . and extends in extreme over the whole trunk and main branches of the aorta, ating the entire arterial system.
>
> deposition is generally the thickest directly over the m of a trunk, or at the bifurcation of a vessel. At points the deposit is frequently so thick, that the is of the divergent vessels are much contracted, and wholly closed. . . .
>
> its commencement, this deposition cannot be detected nt a previous familiarity with its appearance. It is a delicate, soft, succulent membrane, exhibiting a us transparency. . . .
>
> deposition continuously increases in thickness by the on of new strata, and thus gradually passes from the ion of transparency and succulence, characteristic ent formation, to that state in which it appears opaque, bling coagulated albumen, and finally presents a ligaous appearance, having a dull, wrinkled surface. . . .
>
> *atheromatous process* consists in the metamorphosis tegration) of the deposit, into a pulpy mass, compared e French to a purée of peas, consisting of a large number stals of cholesterin, fatty globules, and of molecules iting various degrees of consistence, from coarseness to ne fineness, and consisting of albumen and calcareous

kitansky summarises his view as follows :

> *deposit cannot be regarded as a product (exudation) inflammation in the arteries. . . . The deposit is an endos product derived from the blood, and for the most part the fibrin of the arterial blood. Its formation demonstrates re-existence of a peculiar crasis of the blood,* which is sically *arterial*, although at the present time we are y ignorant of the character of the peculiarity on which pends.

okitansky's views were vigorously opposed by low who regarded atheroma as an inflammatory ess, and the thickening as the product of a reactive feration on the part of the intimal connectivee cells. Virchow's inflammatory notion was soon doned, but his conception of a cellular proliferation continued to influence our views to this day, and rdingly the fibrous thickenings have been almost ersally regarded as overgrowths. Some of the early orities considered that they were designed to reinforce s of weakening in the vessel walls, whereas the more nt observers, with experimental cholesterol sclerosis ind, have been inclined to view them as proliferative tions to the presence of fatty changes. Thus, while e has been almost constant speculation as to the ible causes of overgrowth, the fundamental question ther or not the thickenings are in fact overgrowths hardly been considered.

ew would claim that the work of the last century, d on the overgrowth hypothesis, has led to a satisory explanation of the problem, and we should well to re-examine the grounds on which Virchow able so effectively to discredit Rokitansky's views these have been all but forgotten. They were lained at great length by Virchow (1856) in a paper ch when analysed amounts to little or nothing more n the argument that the lesions, being subendothelial osition, could not be surface deposits. This we now w does not follow, since surface deposits in arteries urally become covered with endothelium. We know that his summary dismissal of the thrombosis othesis was unjustified, because mural deposits loubtedly do occur and in due course develop into ous thickenings. On that score alone, therefore, kitansky's views deserve some further consideration ; when the theoretical points outlined at the beginning of this communication are taken into account their claims become stronger. Fibrous overgrowths of the intima would not be likely to narrow the arteries in the way atherosclerosis does, whereas mural thrombi could hardly do otherwise. Obviously we must no longer take it for granted that all the tissues which lie under the endothelium of the arteries are necessarily intimal in origin, or that the changes we find in them must have arisen within that coat. We now know that the incorporation of surface deposits from the blood is a natural process in the arterial walls,* and we must assume that, if mural deposits in arteries are common the intimal thickenings which result from them must also be common. It remains for future workers to decide which intimal thickenings are the result of surface deposits and which are not.

The introduction of the thrombosis hypothesis, it must be admitted, leaves the problem of the significance of fatty changes in atherosclerosis still unsolved. Mural thrombi, including even the fibrinous vegetations in endocarditis, commonly develop lipoid changes in time, and there seems little doubt that the lipoid substances are products of the thrombi. But it is not to be supposed that all such substances appearing in arterial diseases are derived from this source. Those which are produced in the rabbit's aorta by the administration of cholesterol are presumably the result of a metabolic disturbance, as are probably also those which appear in the human aorta in the condition known as superficial fatty streaking. Here the problem becomes more complex because there are clear indications that fatty changes may sometimes be the cause as well as the result of mural thrombosis. There is little doubt, for instance, that it is the fatty changes and softening of the intima which lead to the atheromatous ulcers with which mural thrombi in the aorta are commonly associated, and it seems likely that the same sequence on a smaller scale may figure in relation to superficial fatty streaking. In that condition fat-laden cells collect under the endothelium and cause it to bulge in a way that would render it liable to rupture, and it is perhaps significant that it is in those places where superficial fatty streaking is common—namely, near the origins of the intercostal branches—that the finer fibrinous encrustations are most readily found. Again it would probably be wrong to suppose that all surface deposits depend on some lesion of the underlying intima, for there is reason to believe that vascular thrombosis is sometimes a general rather than a local condition, occurring in many parts of the vascular system at one time, irrespective of the state of the vessel walls.

CONCLUSION

The thrombosis hypothesis opens a new approach to the problem of arterial disease. If we admit that intimal thickenings may not be overgrowths of the arterial walls, but products of the blood, then in seeking to discover their cause we must no longer confine our attention to the identification of the agents which act on the vessel walls, but must also consider the factors which govern fibrin formation in the circulating blood. In late years evidence has been accumulating that there are certain pathological conditions in which the tendency to thrombosis is unduly increased, and it may be that it is in the frequent recurrence of such conditions that the chief dangers to vascular efficiency lie.

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* It has recently been shown by F. R. Magarey (*J. Path. Bact.* 1949, 61, 203) that the same mechanism is responsible for fibrous thickening of the heart valves.

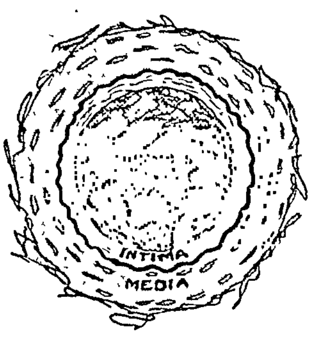


Fig. 1.

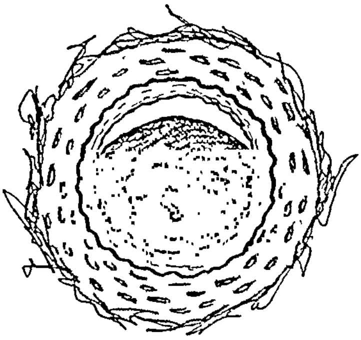


Fig. 2.

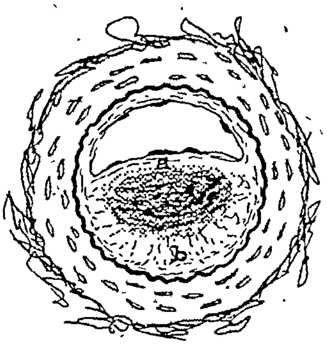


Fig. 3.

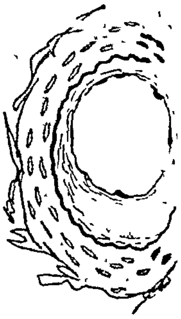


Fig. 4.

as those which do. Mural thrombi in arteries are commoner than is generally supposed, and are extremely variable, ranging from the familiar red masses which develop in the aorta in relation to atherosclerotic ulcers down to microscopically thin fibrinous incrustations, the existence of which is not generally realised. Such deposits become organised and form fibrous thickenings, and when large they may narrow the vessels considerably. Their organisation is essentially the same as that already described, but the process involved depends to some extent on the thickness of the deposit. The thrombus first becomes covered with endothelium so that it is incorporated in the intima, and if it is thin it may then undergo a direct transformation, the fibrin, which forms a shallow layer under the endothelium, becoming condensed and hyaline in appearance and later assuming the staining characters of collagen so that a new fibrous lamina is added to the vessel wall. The intermediate hyaline stage of this process is often very striking, and its appearance and position may give the impression of a hyaline or fibrinoid degeneration of the collagenous ground substance of the intima itself. If, on the other hand, the mural thrombus is large and thick, its conversion into fibrous tissue is more complicated. While the subendothelial layers undergo a direct transformation like that just described, the deeper ones may become vascularised and go through the same process of organisation as is seen in a venous thrombosis or a fibrinous exudate, and there seems little doubt that it is this which gives the appearance often referred to as vascularisation of the intima in atherosclerosis.

In the large deposits fatty changes also appear, chiefly in the deeper zones which are last to become organised, and thus foci of the atheroma are formed. Such foci are not necessarily permanent, however ; for as the organisation advances the lipoid substances are gathered into phagocytic cells and disposed of, while the underlying fibrin is converted into fibrous tissue. Sometimes, in addition to fatty degeneration, softening takes place, and also calcification, with only a relatively limited organisation, and it is in such instances that rupture of the surface occurs with the formation of atheromatous ulcers.

When mural deposits are newly formed they are usually loose in texture, bulky, and ragged ; but they soon become smoothed out and compressed, and as they are converted into fibrous tissue they grow more compact so that quite large deposits may in the end be reduced to comparatively inconspicuous fibrous thickenings. Represented in this way the lesions would appear to be regressive, whereas atherosclerosis as we know it is a progressive disease which increases with age. Its progressive nature may be explained by the fact that mural thrombosis is a recurring condition. In the aorta and coronary arteries multiple deposits of fibrin of different ages and in different stages of organisation are commonly found, one on top of the other. Thus the thickenings which appear in the arteries of old people are often the cumulative effects of recurring thrombosis ; and the individual deposits, though may be small, may nevertheless if often repeated about progressive thickenings which result in e narrowing of the vessels. It should be added that process of organisation not only fibrous but also tissue is formed. With laying down of suc deposits the thickenings become stratified, and be the fibrous strata elastic laminæ develop, so th appearance suggesting a reduplication of the system of the vessel is produced. Much of the comp of the histological picture of atherosclerosis m accounted for by these multiple deposits and b remarkable variety of appearances produced in organisation. The so-called hyaline or fibrinoid deg tion, the vascularisation with occasional extravas of blood, and the fatty changes, which have long regarded as characteristic of atherosclerosis a common features of mural thrombi.

EXPERIMENTAL CONFIRMATION

It is not difficult to show experimentally that thrombi are converted into fibrous thickenings vessel walls. Arterial thrombi can be produced by simple procedures as puncturing the central arte a rabbit's ear, or inserting threads into the femo carotid arteries of dogs, and they quickly become co with endothelium and organised so as to form in thickenings. They thus bear out the thrombosis thesis ; but such experiments are crude as com with those devised by Harrison (1948) in which divided fragments of fibrin clot were injected int veins of rabbits so as to produce emboli in the pulm arteries. The emboli adhered to the walls of the ve became organised, and in three or four weeks fo thickenings comparable with those seen in h pulmonary hypertension. Moreover, it was noticed the thickenings found in the animals which were all to survive for some months had shrunk and were conspicuous than those in the animals killed early i experiments.

DISCUSSION

The existence of a process in which arterial thr are converted into fibrous thickenings has long recognised in thrombangiitis obliterans and al aneurysms, but that the same process may be conce in the pathogenesis of atherosclerosis has not gene been taken into consideration. Yet even in conne with atherosclerosis the thrombosis hypothesis i new conception. A century ago Rokitansky desc atheroma as a deposit on the surface of the vessel fibrinous material derived from the blood, with a f metamorphosis occurring in the deposit. A few sele passages from his *Manual of Pathological Anatomy*, tr lated by George E. Day (1852), will serve to show completely his views anticipated those I have now forward.

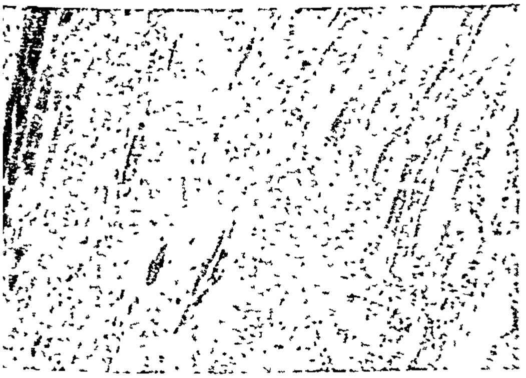
ation and granulation tissue were present at the ary of the lesion. Some of the arterioles present in the showed endarteritis, with some hyaline change in lia (fig. 2).

iography was done through the femoral artery in the part of Hunter's canal, and all the tibial vessels filled y; this also was not done until eight weeks after the nptoms.

ess.—No recovery in power of the tibialis anterior extensor hallucis longus muscles occurred, but the r digitorum longus and brevis both returned to and the area of sensory loss gradually diminished n the patient's discharge fourteen weeks after his nptoms, sensation was normal. In spite of the complete of recovery in the tibialis anterior and extensor longus there was only minimal disability, since the s held more or less horizontal to the ground owing to a ture of these two muscles.

r-up.—The patient was seen again six months after ge, when there was no voluntary or reflex contraction two affected muscles, which were still silent on nyography.

8.—A sergeant, aged 29. He was wounded in action . Europe on Aug. 14, 1944, sustaining a bullet wound ght shoulder with a compound fracture of the humerus ell-splinter wounds of the left chest wall and arm, er involving the brachial artery and median and ulnar The right leg was uninjured. At a field transfusion was given a pint of blood into the right internal ous vein. Next day the wounds in the upper limbs erated on; the left brachial artery was found to be in Two days after injury there was "swelling of the kle, with inflammation of the dorsum of foot and along terior border of the tibia." In view of the severity wounds it is not surprising that little attention seems been paid to the right leg. On Aug. 30, 1944, a right op was recorded and a back-splint applied to correct The patient stated that his right leg "became septic" he blood-transfusion and was treated with 'Antitine.' Three days later he had a severe burning pain foot and could not raise it. He was not aware of any ess of the foot. The pain and inflammation subsided lly in about a fortnight, but the foot-drop remained.


Biopsy specimen (case 2) showing necrotic muscle and granulation tissue. (×50.)

xamination three months after injury the findings in ht leg were as follows. There were two small wellscars over the line of the internal saphenous vein. nt degree of foot-drop was present. There was no nt wasting of the muscles—if anything, the anterior muscles appeared to be more prominent on that side, easurement did not reveal any increase in girth. The r tibial muscles felt hard but were not tender; the uscles were quite soft. Tibialis anterior, extensor um longus, and extensor hallucis longus were paralysed; vas slight extension of the two outer toes by the extensor um brevis. Power in all the other muscles of the leg, ng the peronei, was normal. There was no objective jective disturbance of sensation. The dorsalis pedis sterior tibial pulses were of good volume, and the skin , skin temperature and nutrition of the right foot were similar to those of the left. Clinically, sweat secretion was normal.

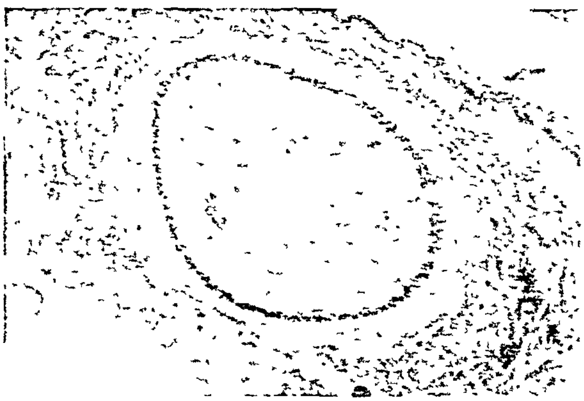


Fig. 4—Biopsy specimen (case 8) showing healthy blood-vessel in infarcted tibialis anterior muscle.

Electrical Reactions.—None of the muscles of the anterior tibial compartment responded to faradism or galvanism. The peronei reacted normally, as also did the extensor digitorum brevis.

Electromyography.—Silence was recorded from all the muscles of the anterior tibial group.

Reflex Vasodilatation Test.—A normal response was obtained from both feet.

Muscle biopsy was done four months after the onset of symptoms. Macroscopically, the tibialis anterior was grey, firm, and avascular. Microscopically, there was massive ischæmic necrosis of representative sections from all the tissues supplied. In one section replacement fibrosis of some duration bordered the anuclear striated dead muscle-fibres. The arterioles and venules present had healthy walls and in some places contained the elements of fluid blood (fig. 4).

Follow-up.—Fifty-three months after the onset of symptoms there was no recovery in any of the muscles of the anterior tibial group. There was a contracture of the long extensor tendons of the toes, but a check-iron was still worn to control a slight degree of foot-drop.

CLINICAL FEATURES

History

As regards onset, the cases can be divided into two groups. Group 1 includes cases 1–6 and 9. In all of these there was a history of activity involving strenuous use of the muscles of the leg either before or at the time of the onset of symptoms. In cases 1 and 3–6 the initial symptom was pain in the leg while playing football, and in all these cases the pain was first noted when kicking. In case 9 pain was first noted at night while the patient was in bed, but he had played football that afternoon. In all cases in this group pain was followed by swelling over the anterior tibial compartment, the classical signs of inflammation, and, later, inability to dorsiflex the foot and toes. Group 2 consists of cases 7 and 8, in which injuries to parts of the body other than the affected limb caused oligæmic shock, for which the patients were transfused into the veins of the leg. Within a short time of the transfusion both patients complained of pain in the front of the leg into which the transfusion had been given, and were later found to have paralysis of the anterior tibial muscles. We regard these two cases as most important from the point of view of the pathogenesis of the syndrome.

Age

The average age of the patients was 25, with extremes of 18 and 40. Except for case 3 they were previously fit members of H.M. Forces.

Limb Affected

In group 1 the right leg was involved in 5 cases and the left leg in 2 cases. Unfortunately, data are not avail-

THE ANTERIOR TIBIAL SYNDROME

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IN the last five years there have been several accounts of a peculiar condition, apparently not described before, affecting the muscles of the anterior tibial compartment of the leg.

In a paper on soft-tissue complications of fractures of the leg Sirbu et al. (1944) described 2 cases of localised gangrene of the anterior tibial muscles not associated with fracture. In the first of these, on the fifth day after the repair of a small muscle hernia through the anterior crural fascia, fever and signs of inflammation developed; the sutures in the skin and fascia were removed to reveal a greyish-white gangrene of the tibialis anterior muscle, the entire belly of which was excised. Their second case was in a soldier, aged 38, who developed severe pain in the front of both legs after marching. He was seen on the fourth day after the onset of this symptom, when the fronts of his legs were swollen and red and he could not extend his feet or toes. Exploration of the anterior tibial compartments in this case also revealed avascular greyish-white muscles which on histological examination were necrotic.

Horn (1945) described 2 cases of acute ischæmia of the anterior tibial muscles and long extensor muscles of the toes. Both patients were young healthy soldiers who developed severe pain along the fronts of the legs while marching. This was followed by swelling, redness, and glossiness of the skin over the anterior tibial compartment and by paralysis of the tibialis anterior muscle and the extensors of the toes. Phalen (1948) included among 4 cases of ischæmic necrosis of the anterior tibial muscles that of a young man who, after a half-mile walk, developed painful swelling of the pretibial muscles. At operation the affected muscles were soft, friable, and reddish-grey. Pearson et al. (1948) have reported the same condition in a young Greek in whom symptoms developed in both legs after broad-jumping on a concrete pavement.

These reports are all from America, but in this country Hughes (1948) has published 3 cases of "ischæmic necrosis of the anterior tibial muscles due to fatigue." Two of his patients were fit Servicemen who developed symptoms after playing football. The third was a youth, aged 19, whose symptoms developed in association with a systemic febrile illness which may have been periarteritis nodosa.

While working in three widely separated areas of this country we have seen 9 cases, 2 of which we report in detail, all of them being summarised in tables I–IV.

ILLUSTRATIVE CASE-RECORDS

Case 1.—A signalman, aged 20. Seven weeks before admission he played three games of competition football on three successive days under muddy conditions with a sodden and heavy ball. On the third day he found that on running and kicking he experienced pain down the front of the right leg. He carried on through the first half of the match, but later the pain became unbearable, and he limped off the field. He rested for 5 minutes and then tried to play again. After once more kicking the ball he felt the pain come on again severely, and found he had suddenly developed on the front of his leg an oval swelling about 3 in. by 2 in. two-thirds of the way up the shin. This swelling was tender, warm, and throbbing, and though it was so localised certain that he had not been kicked on the leg game. He immediately stopped playing and rested, off to his billet; the throbbing pain continued and ke awake part of the night. Next day he limped round the and on the following night the pain was worse. On the morning after the onset the swelling was surrounded area of redness about 6 × 3 in. The patient was bed and treated as a case of cellulitis of leg, with sy penicillin. He had a fever of 99–100°F for five days, and the pain, redness, and swelling persisted for one more day before it disappeared. He then tried his foot for the first time and found he could not dorsiflex it or straighten his toes. A week later some movement returned to his toes, and then his condition remained stationary until he was admitted to hospital seven weeks after the onset. His past history showed that on route marches he had had pain in the front of both legs, and, even before joining the Army at the age of 17, he had had pain in his legs after severe exertion.

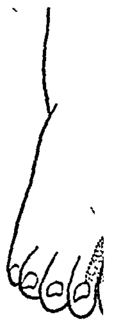

Fig. 1—Area of loss (case

Examination showed a diffuse woody indurated swelling of the right anterior tibial region, extending from 2 in. below the lower of the patella to 3 in. above the malleoli, warmer than the other side, painless, and not tender. patient could not dorsiflex his right foot or rig toe at all, but there was only a minimal degree of foo since the tendons of the anterior tibial and extensor h longus muscles were standing out and easily palpable i of the ankle-joint, suggesting a persistent spasm or contr of these muscles. In addition there was some weak dorsiflexion of the four lateral toes, and the extensor dig brevis muscle was not contracting. An area of senso to cotton-wool touches and of blunting to pinprick ex from the dorsum of the big toe round to the dorsum second toe, including the skin fold between the two The dorsalis pedis and posterior tibial arteris were pu normally to touch; oscillometry was not done.

Electrical Reactions.—Normal responses were obtai the extensor digitorum longus and brevis and pe longus and brevis muscles. There was no response to f or galvanic stimulation in the tibialis anterior and the ex hallucis longus muscles.

Electromyography.—There was complete silence i tibialis anterior and extensor hallucis longus muscles, normal motor unit action potentials elsewhere in the le

Muscle biopsy was done eight weeks after the on symptoms, the tibialis anterior muscle being incised. scopically it was clearly ischæmic, especially in the d areas, where it was yellow and appeared entirely ava In its more superficial part there was some bleedi incision, and these fibres appeared normal. Microscop the biopsy specimen, though still retaining the outline muscle fibrils, showed complete loss of nuclei and all detail. The small vessels in between the fibrils were eng with blood. The appearance was one of infarction.

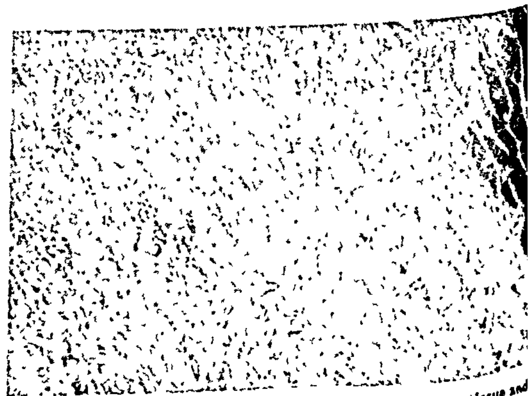

Fig. 2—Biopsy specimen (case 1) showing dense fibrous tissue and of necrotic muscle. (× 50.)

ed the appearance of the muscle as normal (note is is a case in which the extensor digitorum longus t paralysed).

microscopical findings in the muscles are illustrated 2–4, and the salient features of the pathological are given in table IV. The findings may be rised as follows: (1) except in case 4, the overture was that of massive ischæmic necrosis of (infarction), with replacement fibrosis taking rom the periphery; (2) evidence of recent or old rhage within the muscles was observed in some cases; and (3) the blood-vessels in the muscles ed healthy or else showed changes which were tible with the fact that the muscle which they pplying had been dead for some weeks.

ress.—Of the 9 patients 2 were not followed after lischarge from hospital. Three were kept under ation for less than twelve months after the onset ir symptoms. This period is probably too short ble progress to be accurately assessed with a lesion nature, but nevertheless some interesting and, we e, significant factors emerge from these 3 cases. was recovery of sensation and activity in the or digitorum brevis in cases 1 and 2 at fourteen and three months respectively. In case 4 both the s anterior and the extensor digitorum longus showed recovery at six months. The other 4 cases have followed for long periods—case 5 for fifty-four s, case 6 for fifty-six months, case 7 for forty-nonths, and case 8 for fifty-three months. In all cases the degree of recovery in the anterior tibial es was minimal. All still required some form of atus to control the foot-drop, and in 2 of the cases l 8) contractures of the long extensor muscles of the ad caused trouble.

TABLE II—MUSCLES INVOLVED

eronei		Tibialis anterior			Extensor digitorum longus			Extensor hallucis longus			Extensor digitorum brevis		
F	G	V	F	G	V	F	G	V	F	G	V	F	G
+	+	0	—	—	3	+	+	0	—	—	0	+	+
+	+	0	—	—	0	+	+	0	—	—	0	+	+
+	+	0	—	—	0	±	±	0	—	—	3	+	+
+	+	0	+	+	0	—	—	0	—	—	0	—	+
+	+	0	—	—	2	—	—	0	—	—	0	—	+
±	+	3	—	±	3	—	±	0	—	—	0	—	—
N.R.	..	0	N.R.	..	0	N.R.	..	0	N.R.	..	0	N.R.	..
+	+	0	—	—	0	—	—	0	—	—	3	+	+
+	+	0	—	—	0	—	—	0	—	—	0	+	+

V, voluntary contraction (M.R.C. notation).

F, faradic response; G, galvanic response: + = normal. ± = weak response. — = absent response.

N.R., no record.

Electrical reactions unsatisfactory because of œdema.

Lesion

all of our cases we have found evidence of involve-of the anterior tibial nerve, but this nerve lesion either not to have been present in other cases or ve been overlooked by previous observers. In 7 r 9 cases the extensor digitorum brevis muscle was ysed, and in the remaining 2 cases weak (M.R.C. ng 3). This muscle is not one of the anterior group, and could not have been involved by direct ression in any rise of tension in the pretibial compart-. Moreover, its loss of function could not have been o muscle ischæmia from interference with its blood-y in that compartment, because in only 1 case was no galvanic response in the extensor digitorum s and in this case electromyography showed that the le was denervated, and not silent like the ischæmic muscles. Therefore we conclude that the loss of function in the extensor digitorum brevis was due to a lesion of the anterior tibial nerve. This view received additional support in 5 of our cases which showed some sensory impairment in the distribution of this nerve. The absence of sensory loss in the other cases is not surprising, since even where the anterior tibial nerve is known to be destroyed, it is often difficult to find a corresponding area of sensory loss. Since it is unlikely that the nerve was directly contused, stretched, or divided in any of our cases, the nerve lesion is probably compressive or ischæmic, and we believe that both types of lesion have occurred in this series. In cases 1, 2, and 3 the motor (and sensory) recovery of the extensor digitorum brevis muscle was complete within three months, and at no time had this muscle lost its response to faradism, but the data are somewhat incomplete in case 3. These findings are typical of compression neuropathy. In the other cases there was no return of nerve function (even after fifty-six months in case 6). The only two types of nerve lesion in continuity which lead to permanent paralysis are those due to ischæmia and to stretching. Since stretching is improbable, we believe that the pathology of the nerve lesion in these cases was ischæmic neuropathy. Unfortunately a nerve biopsy was not done in any of our cases. In those cases in which the nerve lesion recovered, the lesion may have been a mild and reversible type of nerve ischæmia.

TABLE III—ELECTROMYOGRAPHIC FINDINGS

Case no.	Tibialis anterior	Extensor digitorum longus	Extensor hallucis longus	Extensor digitorum brevis
1	Silent	Normal	Silent	N.R.
2	Silent	Normal	Silent	N.R.
6	Denervated and recovering	N.R.	Silent	Denervated
7	Silent	N.R.	N.R.	N.R.
8	Silent	Silent	Silent	N.R.

N.R., no record.

PATHOGENESIS

The syndrome consists of a lesion of the muscles of the anterior tibial compartment of the leg and a lesion of the anterior tibial nerve. On both the clinical and the pathological findings the muscular lesion may be accepted as ischæmic. The nerve lesion is, we believe, due either to compression or to ischæmia (see above).

TABLE IV—PATHOLOGICAL FINDINGS

Case no.	Interval *	Macroscopic appearances	Microscopic appearances
1	8 weeks	Avascular, necrotic	Infarcted muscle organisation and granulation tissue at periphery
2	20 days	Avascular, necrotic	Necrotic muscle tissue, new fibrous tissue formation
4	3 months	Pale and fibrotic	No necrosis, patchy muscle-fibres in dense fibrosis
5	4 months	Yellow-green and friable	Necrosis, fibrosis, hæmorrhages
6	3 months	Pale but not hard	Infarcted muscle fresh patchy hæmorrhages
7	6 months	Deep greenish, avascular	Necrosis, replacement by fibrous tissue, old and recent hæmorrhages
8	4 months	Grey, firm, and avascular	Massive ischæmic necrosis, replacement fibrosis
9	10 weeks	Hard and avascular	Ischæmic fibrosis, peripheral fibrous tissue replacement

* Interval between onset of symptoms and biopsy.

Data refer to findings in tibialis anterior muscle. In cases 4–7 specimens obtained from extensor digitorum longus muscle gave similar findings, except in case 6, in which extensor digitorum longus muscle was normal macroscopically and showed only intramuscular hæmorrhages microscopically.

able which would enable us to correlate this incidence with the "footedness" of the patients. In both cases in group 2 the right leg was affected, but it is presumably fortuitous that this limb was selected for the transfusion in both cases.

Motor Findings

Table II shows the muscles affected in each case. It will be noted: (1) that the peronei were normal in every case; (2) that, of the muscles of the anterior tibial compartment, the extensor hallucis longus was paralysed in 6 of the 9 cases; (3) that the extensor digitorum brevis, though not a muscle of the anterior tibial compartment, was paralysed in 7 cases. We regard this as a finding of considerable significance and discuss it below. In all cases the consistence of the muscles of the anterior tibial compartment was abnormal—"woody," "indurated," "firm," and "hard" were some of the adjectives used to describe them. Clinical experience associates such a finding with ischæmic necrosis of muscle. Another significant finding present in most of the cases was that, though the extensor muscles were paralysed and the patient could not voluntarily dorsiflex his foot, there was not much foot-drop. This seemed to be due to a contracture of the extensor muscles.

Electrical Reactions and Electromyography

The responses of the muscles to faradism and galvanism are also set out in table II. *It will be noted that in most cases the muscles of the anterior tibial compartment which were paralysed did not respond to either faradism or galvanism.* The exceptions are cases 2 and 3, in which the extensor digitorum longus, though showing no voluntary response, reacted to both faradism and galvanism, and case 4, in which a paralysed *tibialis* anterior did likewise. In cases 1, 2, and 9, however, the extensor digitorum brevis was paralysed but reacted *well to both faradism and galvanism.* Electromyograms were obtained from 5 of the cases (table III). In all "silence" was recorded from one or more of the muscles. *This is a reliable indication that these muscles were,* at least in part, fibrotic or necrotic.

Sensory Findings

In cases 1–4 sensation was lost over a small area, on the dorsum of the foot, based on the cleft between the first and second toes (fig. 1) in the distribution of the anterior tibial nerv case 7 hypæsthesia in this area was recorded. A *area of anæsthesia on the outer side of the leg* was in case 6; but, since there was no analgesia, and s ing in the affected area was normal, this was prob *functional in origin. In the other 3 cases* sens was normal.

Vascular Findings

At the time when the patients came under our pulsation in the arteries of the foot was judged t normal in all cases. It should be noted, however, the shortest interval between the onset of symptom examination was a week (case 3). Oscillometry done in 4 cases (cases 4–7). In case 4 the oscilla in the affected leg were slightly decreased, in the other 3 they were increased. A reflex test was done in case 8, and there was no di between the responses of the affected and the legs. Arteriography was performed on 5 cases (1 4–7). In all cases the films showed good filling o major arteries of the leg (popliteal, peroneal, and and posterior tibial), and there was no evidenc occlusion, partial thrombosis, or any other lesion in vessels. The degree of filling of the muscle bra was not good enough to enable us to draw any concl about the state of the arterial circulation in the mu

Pathological Findings (table IV)

Biopsy specimens of muscle were obtained fro *cases—all except case 3. They were obtained at* inte ranging from twenty days to six months after the o of symptoms. Specimens were obtained from the tib anterior in these 8 cases, and from the extensor digito longus in cases 4–7. In all the 8 cases the tibialis ant was macroscopically necrotic in whole or in part. *of the 4 cases* the extensor digitorum longus was necrotic. The exception was case 6, in which the su

TABLE I—PRINCIPAL FEATURES OF ANTERIOR TIBIAL SYNDROME

Case no.	Age (yr.)	Affected limb	Apparent precipitating factor	Pretibial pain	Signs of inflammation	Foot-drop	Muscles paralysed	Sensory loss	Pulses		Oscillometry	Art gr
									P.T.	D.P.		
1	20	Right	Playing football	Severe	Heat, redness, and swelling	Minimal	T.A., E.H.L., E.D.B.	Anterior tibial	+	+	..	..
2	18	Left	Marching	Severe	Heat, redness, and swelling	Slight	T.A., E.D.L., E.H.L., E.D.B.	Anterior tibial	+	+	..	..
3	20	Right	Kicking football	Severe	Heat, redness and swelling	Partial	T.A., E.D.L., E.H.L.	Anterior tibial	+	+	..	..
4	29	Right	Playing football	Severe	"Abscess" of leg incised	Present	T.A., E.D.L., E.H.L., E.D.B.	Anterior *tibial*	+	+	Right < left	No l see
5	40	Right	Playing football, dancing	Moderate	Swelling and redness	Present	T.A., E.H.L., E.D.B.	None	+	+	Right > left	No la seen
6	29	Right	Playing football	Moderate	Swelling and a "bruised *appearance*"	Present	E.H.L., E.D.B.	Outer side of leg	+	+	Right > left	No la seen
7	23	Right	Blood-transfusion	Severe	Swelling	Present	T.A., E.D.L., E.H.L., E.D.B.	Anterior tibial	+	+	Right > left	No la see
8	29	Right	Blood-transfusion	Severe	"Inflammation"	Present	T.A., E.D.L., E.H.L.	None	+	+	..	..
9	21	Left	Playing football	Aching	Swelling, redness	Slight	T.A., E.D.L., E.H.L., E.D.B.	None	+	+	..	..

Muscles paralysed
- T.A., tibialis anterior
- E.D.L., extensor digitorum longus
- E.H.L., extensor hallucis longus
- E.D.B., extensor digitorum brevis

Pulses
- P.T., posterior tibial
- D.P., dorsalis pedis

arrested, is at least seriously impaired. If the
continues to use the muscles during this phase,
nger would be increased still further. Barcroft
illen (1939) have shown that sustained maximal
tion of a muscle causes arrest of the circulation
muscle, and this may be an important factor in
tating the onset of muscle necrosis.

ie 2 cases where the syndrome was the sequel to a
ransfusion given into the limb we suggest that the
was either not inserted properly into a vein or
slipped after insertion, with the results that the
tracked up into the anterior tibial compartment,
ly along one of the tendons, and so increased the
within the compartment. It is also possible that
e 2 cases firm bandaging of the limb to a splint
the transfusion may have aggravated the condi-
y interfering with the venous return through
cial veins.

significant findings in our cases which we believe
t this hypothesis may be repeated: (1) the
e of old and recent intramuscular hæmorrhages
e of the biopsy specimens of muscle, and (2) the
e that in some cases the lesion of the anterior
ıerve is due to compression.

hes (1948) does not accept increased tension in
iterior tibial compartment as the chief factor,
e he believes that, if it were, all three muscles
be equally affected. In his cases the proximal
of the tibialis anterior escaped damage, but this
ot so in our cases. Of the three muscles the
or hallucis longus is the most vulnerable, then the
anterior, and the extensor digitorum longus is
ikely to escape damage. There is a good deal of
ce that the extensor hallucis longus is particularly
able—e.g., in immersion foot (another condition
swelling of the leg) it is often the only muscle
leg to show pathological changes (Blackwood
This may be because it is the most deeply placed
three muscles in the compartment, or because its
uscular vascular anastomosis is less efficient
hat of the other muscles, as suggested by Clark
It is not so easy to explain why the extensor
um longus is less vulnerable than the tibialis
r. Hughes (1948) cites Blomfield as stating that
tensor digitorum longus is supplied by branches
the anterior tibial, peroneal, and posterior tibial
s, whereas the tibialis anterior is supplied by the
r tibial artery alone. Nevertheless, a uniform
tension within the anterior tibial compartment
affect equally all branches entering it irrespective
ir origin. More probably the tibialis anterior
more severely in the cases associated with
lar exertion because it is subjected to greater
than are the extensors of the toes.

s Occlusion

he above explanation is correct, it may reasonably
ed whether the syndrome might not be the result
erference with only the venous drainage from the
or tibial compartment. Though the view that
ann's ischæmia was the result of the obstruction
venous return from the affected muscles has now
disproved, it has been shown that occlusion of
enous drainage from a muscle will produce patho-
l changes. The essential finding in such cases
increase in fibrous tissue between individual
le-fibres, and the histological picture is different
that seen as a result of arterial occlusion (Griffiths
In case 4 the histological findings were of this
(see table IV), but the picture in all the other cases
is series and in those previously published was
ical with that observed in Volkmann's ischæmia.
this we may conclude that, though some cases of
nterior tibial syndrome are the result of venous
occlusion alone, in most cases the arterial circulation is also interrupted.

Metabolic Disturbance

Theoretically it may be postulated that necrosis of an active muscle might be the result either of an excessive accumulation of normal metabolites which are not removed sufficiently rapidly or of the production of abnormal metabolites. In the present cases we have no evidence which would prove or disprove this hypothesis, but we think such a mechanism is unlikely.

Conclusion

We may sum up our views on pathogenesis as follows: Sudden and unaccustomed use of the pretibial muscles in untrained men traumatises them, so that, as the result of the rupture of a few muscle-fibres or of hæmorrhage into the muscle, the swelling of the muscles that normally accompanies exertion is exaggerated; this produces tension within the rigid anterior tibial compartment sufficient to impede the circulation to the muscles and leads to ischæmic necrosis. This is the sequence of events in most cases, but any other factor which leads to a rise in tension within the compartment will produce the same effects.

DIAGNOSIS

The diagnosis depends on a history of the onset of pain in the pretibial region during or shortly after strenuous exercise, followed by signs of inflammation over the anterior tibial muscles and by inability to dorsiflex the foot and toes. The syndrome must be differentiated from cellulitis of the leg, osteomyelitis of the tibia, tenosynovitis, Volkmann's ischæmia, acute thrombophlebitis, "pretibial fever," and lesions of the lateral popliteal nerve.

In *cellulitis* and *osteomyelitis* the systemic manifestations of acute infection will be more pronounced, and the ability to move ankle and toes will usually be preserved.

Tenosynovitis of the tendons of the tibialis anterior muscle or the long extensors of the toes often develops under conditions similar to those associated with most of the cases of the anterior tibial syndrome, but the characteristic crepitus may be felt or heard, and the loss of function will be minimal.

Volkmann's ischæmia is due to more severe trauma to the limb, and there is usually an associated fracture; moreover the ischæmia will affect not only the anterior tibial group of muscles but also the flexors of the toes and even the peronei and calf muscles.

In *thrombophlebitis* the area of inflammation will be centred on a thrombosed vein, and again there should be little interference with the movements of foot and toes.

"*Pretibial fever*" is mentioned by Pearson et al. (1948) as a differential diagnosis in their case. It is "an unusual febrile illness of approximately five days' duration characterised by minimal respiratory manifestations; frontal, postorbital, and lumbar aching: leucopenia: palpable spleen; and an erythematous rash over the pretibial regions." (Daniels and Grennan 1943.)

Little difficulty arises with traction *lesions of the lateral popliteal nerve* associated with injuries to the knee-joint. In such cases the trauma is usually severe, there are undue lateral mobility of the knee and a very obvious foot-drop, pretibial pain is seldom severe, the peronei muscles are affected as well as the anterior tibial group of muscles, and the electrical excitability of the muscles will show that the paralysis is due entirely to a nerve lesion.

TREATMENT

Since complete destruction of a group of muscles in the leg has followed undue exertion, and since most of these cases are not recognised until this effect is

Infection

Since in all cases signs of inflammation were present over the affected anterior tibial compartment, infection must be considered first as a possible cause. Systemic manifestations of infection were absent or minimal, however, and in 5 cases in which the blood was examined there was no leucocytosis. On the other hand, it is well known that an inflammatory reaction is often observed in the skin overlying ischæmic muscles—e.g., in Volkmann's ischæmia. In case 4 the inflamed area was incised in the belief that there was an abscess, but only necrotic material was obtained, and a later infection which was observed in the incision was secondary. Incision or spontaneous discharge of collections of liquefied muscle is also not uncommon in limb ischæmia following fractures or injuries to blood-vessels. The pathological findings are not those of acute infective myositis; nor do they correspond to those of dermatomyositis or any other known inflammation of muscles. The evidence all suggests that the inflammation is a secondary response to muscle necrosis and not the primary reaction.

Arterial Injury or Thrombosis

Griffiths's (1940) investigation into the cause of Volkmann's ischæmia has shown that many, if not all, cases of muscle ischæmia that follow injury to a limb are due to an arterial lesion. Most workers believe that the anterior tibial syndrome is allied to Volkmann's ischæmia and is the result of arterial injury.

Sirbu et al. (1944) attribute their cases to arterial injury, without discussing the nature of the injury.

Horn (1945) suggests that the anterior tibial syndrome is the result of a traumatic thrombosis of the anterior tibial artery. He postulates a pre-existing lesion of the artery with narrowing of the lumen, perhaps the result of frequent repeated minor traumata sustained when the leg is subjected to sudden unaccustomed strains. At the onset of symptoms sudden thrombosis occurs in the already narrowed arterial lumen.

Phalen (1948) explains his case on the basis of injury or functional occlusion of the anterior tibial artery.

Hughes (1948), who made an extensive anatomical and experimental study of the blood-supply of the anterior tibial muscles in man and the rabbit, believes that the anterior tibial syndrome is due to segmental spasm of the anterior tibial artery, and has shown that, to produce necrosis of all the anterior tibial muscles, a considerable length of the artery must be affected.

The several variants of this hypothesis have points in their favour. The most important of these is that the pathology is identical with that of Volkmann's ischæmia and of muscle ischæmia following arterial wounds. It seems to us, however, that there are also many points against the view that the syndrome is the result of arterial injury. The first is the state of the circulation in the affected limb. Unfortunately none of the cases was seen by us in the acute stage. When they were examined from two weeks to six months after the onset, however, the circulation in the affected limbs, judged by pulsation in the arteries of the foot, oscillometry, vasodilatation tests, and arteriography, was considered to be normal in all cases. In only 1 of the reported cases (Hughes' case 3) is there a definite record of an absent pulse in the anterior tibial artery. It seems improbable that in so many cases a degree of arterial spasm or thrombosis sufficient to produce ischæmic necrosis of the anterior tibial muscles would exist without some degree of permanent impairment of the circulation. Though the nutrition of the hand in late cases of Volkmann's ischæmia may be excellent and the radial pulse palpable, oscillometry and arteriography nearly always reveal some permanent interference with the circulation (Holmes et al. 1944). The degree of trauma to the affected limb is, moreover, relatively slight and than would be expected to cause arterial fit young men. Indeed, in 2 of our cases the trauma sustained by the limb was the insertion needle for blood-transfusion. Admittedly in cases arterial spasm might have arisen seco venous spasm (as can occur in thrombophlebitis been favoured by the presence of oligæmic shock d the wounds elsewhere in the body, but we believe is a simpler and more likely explanation. Final none of our cases was there any clinical or pathol evidence suggesting either local or general a disease predisposing to thrombosis.

Trauma to Muscle

In most cases there is a history of unaccust strenuous exercise of the limb either at or immedi before the onset of symptoms. This strongly favour view that muscular strain is in some way intim connected with the pathogenesis. Pain in the pre region is a not infrequent complaint among athlet the early stages of training, and in the U.S. descriptively diagnosed as "shin-splints."

> "The affected muscles become firm and swollen, an attempt at active or passive flexion and extension ankle is painful. The cause is assumed to be due to rece trauma of the unconditioned muscles; nothing is kno the pathology. Rest and warm applications may be req in severe cases, but most athletes 'walk off' their ailm (Pearson et al. 1948.)

It seems probable that the present syndrome is a advanced stage of the same condition in untrained who suddenly subject their legs to unwonted musc strain. This is the basis of the explanation given Pearson et al. (1948) for their case. Necrosis of mu as a sequel to trauma is a well-established patholog condition, and it may be accepted that in most c trauma to the muscles as a result of over-exertion p an important rôle in pathogenesis. In the cases in w the syndrome developed after blood-transfusion into limb, however, there is no evidence of such mu trauma, and to explain all the cases some additio factor must be found.

Pressure in Anterior Tibial Compartment

This possibility is considered by Hughes (1948), w concludes that it is an important aggravating fac The anterior tibial compartment of the leg has very r walls, though as Hughes points out, it is not close its lower end. In the proximal two-thirds of the comp ment, where there are the muscle bellies of the tib anterior and the long extensor muscles of the there is little room to spare, and it is problemat whether the small aperture at the ankle, through w the tendons of these muscles pass and where they firmly held down by ligaments, can form an effi safety-valve if the tension rises in the proximal por of the compartment. According to Hughes (1948) tracted activity of a muscle may lead to an incr in its bulk by as much as 20% owing to the retentio excessive fluid within the tissue spaces. This swell will be aggravated if the strain on the muscle is suffici to rupture some muscle-fibres and perhaps to cause so intramuscular hæmorrhage.

From the history of most of the cases it seems rea able to suppose that all three of these events might ha occurred. The result would inevitably be an incre in tension within the anterior tibial compartm The effect of this would be to embarrass the circulati to the muscles in the compartment, either by interfe directly with the circulation in the intramuscular vasc network, as Hughes suggests, or by impeding the ve return and thus increasing the swelling and ter until the stage is reached when the arterial circulati

THROMBOANGIITIS OBLITERANS TREATED BY HYPOGLYCÆMIA

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R 20 years ago French workers (Ambard et al. Yacoël and Boyer 1927, Yacoël and Vaquez 1927) bed cases of thromboangiitis obliterans which ad treated with injections of 10–20 units of insulin for long periods. Rest pain and claudication pain relieved, the skin became more normal in tempera- nd colour, superficial veins reappeared, and in one he oscillometric readings improved. They supposed thromboangiitis obliterans developed as a result trophic disturbance in the vessels' walls, nutrition, they suggested, was improved by n..

ring the hypoglycæmia produced by injecting large of insulin for the treatment of mental disorders, ificant increase in peripheral blood-flow has some- been observed. There is a rise in systolic and lic blood-pressure to a maximum at the end of econd, or early in the third, hour of hypoglycæmia. believe that during insulin treatment the cardiac t increases.

ese observations prompted me to administer insulin vanced cases of thromboangiitis obliterans which under my care and had not responded to other ment. It was decided to inject sufficient insulin oduce a prolonged and fairly deep hypoglycæmia. e hope of exerting the greatest possible effect on the heral collateral arteries which were unaffected or aratively little affected by the disease. This report ibes the results in twenty consecutive cases, all

METHOD

full examination was carried out, including, in tful cases, radiography of the chest and an electro- iogram. Septic foci—e.g., in the teeth—were inated. Severe cardiovascular and renal disease pronounced disturbances of liver function were n as contra-indications to insulin treatment; and mild renal or hepatic dysfunction treatment was ertaken only with the utmost caution. All patients advised to stop smoking.

atients stayed in one ward under the care of specially ructed nurses. Equipment was kept at hand for the inistration, where necessary, of glucose by the avenous or nasal route.

nsulin was given twice daily—before breakfast, and ours after the midday meal. Each course of treat- t continued for about 20 days and was followed by nterval of 10 days. The number of courses depended the patient's general condition and peripheral blood- . If, after three or four courses, further treatment needed, the patient was given a rest of about 6 weeks ore the next course.

he initial dose of insulin was 40–60 units in the ming and 60–80 units in the afternoon. Thereafter amount was adjusted, according to the blood-sugar dings and clinical observations, so as to produce ll-marked hypoglycæmia lasting 3 hours. The largest ses given in this series were 80 units in the morning d 100 units in the afternoon.

actions to Insulin

Some patients proved more sensitive to insulin than hers, and for the first few days all were closely watched that if a severe reaction arose hypoglycæmia might promptly interrupted.

The blood-sugar level was estimated on the first day of treatment, and thereafter from time to time. In patients tolerating the treatment well, the level began to fall an hour after each injection: during the second and third hours it was about 40–50 mg. per 100 ml. or less.

About half an hour after an injection of insulin most patients felt hungry and tired; later some became anxious or excitable and sometimes behaved as if they were drunk. Most of them perspired profusely; some were pale and felt chilly. In the later stages consciousness sometimes became clouded and a fine tremor of the body was noticeable. Very occasionally convulsions or double vision occurred. In about half the patients the blood-pressure rose during the first and second hours and then returned to normal. In others it fell; and the effect on the pressure varied in the same patient. The pulse-rate also varied: sometimes it was quickened and sometimes slowed. In most cases leucocytosis appeared 2 hours after the start of hypoglycæmia; but the white-cell count varied in the same patients on different days. Urine analysis performed before injection of insulin and 2 and 6 hours afterwards showed no significant changes.

After about 3 hours the hypoglycæmia was ended by giving a cup of some well-sweetened drink followed after 15 minutes by a large carbohydrate meal. In emergency, when a patient became too excited or reached the stage of clouded consciousness the hypoglycæmia was quickly interrupted by injecting glucose intravenously. Latterly, however, patients who reacted in this way were given a few mouthfuls of a sweetened drink in order to diminish their hypoglycæmia; usually this had a satisfactory effect and the hypoglycæmia could then be safely maintained for up to 3 hours. Since this modification has been introduced, intravenous injections of glucose have rarely been necessary.

After their hypoglycæmic period the patients often slept soundly for 1–2 hours.

Some patients who received repeated courses of treatment developed a diminished tolerance to insulin, their reaction becoming stronger and quicker; the dose was then reduced. Occasionally a patient's reaction to the same amount of insulin varied during a single course, either from day to day or even between the morning and afternoon of the same day.

In the intervals between courses the affected limbs were submitted to short-wave diathermy, which probably helped towards the favourable results.

ILLUSTRATIVE CASE-RECORDS

Case 1.—A labourer, aged 42, had had thromboangiitis obliterans, affecting the right lower limb, since January, 1945. In July, 1945, he underwent right lumbar ganglionectomy, and in September, 1945, his right big toe was amputated. In December, 1946, the left lower limb became affected, and in September, 1947, left lumbar ganglionectomy and amputation of the left big toe were undertaken. From January, 1948, the condition of both his lower limbs deteriorated despite various treatments. He had severe claudication and rest pain and had been advised to have his legs amputated.

The patient was admitted on June 24, 1948. During the last few months he had smoked 5 cigarettes daily, and previously about 15. His general condition was poor. Both feet and the distal parts of both legs were dark blue and very cold; the toes and lower part of both feet were swollen. Pulsation was just palpable in the popliteal arteries but was impalpable in both dorsalis pedis arteries. He could hardly walk, even round the ward, owing to claudication pain. He was unable to sleep without drugs and was mentally depressed, anxiously watching his feet.

Between June 29, 1948, and May 29, 1949, nine courses of hypoglycæmia were given. Rest pain disappeared during the first course. The lower legs and feet improved continuously, becoming warm and of normal colour by the end of the fifth irreversible, it is important that any possible prophylactic measures should be made as clear and as widely known as possible.

We have been impressed by the absence of reports of the anterior tibial syndrome in trained athletes or professional footballers, and by the history of almost complete lack of graduated physical training in those who have developed the condition after exercise. It seems unwise to allow untrained young men to undergo repeated violent leg exercise such as obtains in Association football without either reasonable training or reasonable rests between each game, or to allow them to go on long route marches without considerable graduation of training beforehand.

If, however, pretibial pain develops during exercise, it is very important that a serious view of it be taken. In particular all further exertion must be prohibited for some few days; and, if any hardness or swelling of the muscles is found on examination, complete rest in bed must be ordered, with careful repeated observation of muscle function. That this syndrome is reversible at one stage of its progress is shown by the following case seen by one of us (A. B. C.) and not included in the present series:

> A sailor, aged 19, stationed ashore, played a game of football for the first time in three years. Pain in the right leg, worse on running and kicking, came on towards the end of the match, and the leg was tender and a little swollen in front below the knee. The patient was right-footed. He reported sick and was admitted to hospital that evening with the diagnosis of "cellulitis of leg."
>
> *On examination* the tibialis anterior muscle was firm and tender, with some redness over the front of the shin, and both this muscle and the extensor hallucis longus muscle were weak (M.R.C. grading 3), full dorsiflexion of the foot being impossible, though there was no foot-drop and the toes moved well. The extensor digitorum brevis was functioning normally, no sensory loss was found, and pulsation appeared normal in the arteries of the foot. The electrical reactions were weak in the affected muscles but qualitatively normal. Muscle biopsy was refused.
>
> *Treatment and Progress.*—The patient was put strictly to bed, and the function of the affected muscles gradually improved, with the result that he was well within seven days, with full muscular power. He was discharged a week later and warned about undergoing any such effort again without graduated training beforehand.

This case was considered to be a mild anterior tibial syndrome in which early cessation of exercise and early rest in bed helped to prevent the condition becoming absolute and irreversible.

If our views of the ætiology of this syndrome are correct, and if there is any way of knowing whether the process has passed the stage of possible recovery with rest in bed, then we are justified in urging that the anterior tibial space should be surgically decompressed immediately as an emergency measure. We believe that, once the patient develops foot-drop or inability to move his toes, the stage of expected recovery with conservative measures has passed. We lay particular emphasis on this since the only report we have found of recovery of function of the tibialis anterior muscle, once foot-drop has developed, was in one of the cases described by Sirbu et al. (1944) in which the muscle was decompressed on the fourth day because bilateral pretibial ischæmia had developed after a long march:

> "Longitudinal incisions were made and fasciotomy performed over both muscle bellies. Bilaterally, the tibialis anterior was avascular, greyish-white in colour, and markedly swollen. They bulged through the crural fascia, which was tightly stretched over them prior to incision. Following release of tension the muscle on the right leg recovered, aside from a small superficial area of gangrene. But on the left side, gangrene of the muscle was practically complete, requiring excision."

Since we do not believe that arterial spasm important factor in the muscle necrosis, we d advocate measures designed to relieve spasm promote vasodilatation.

After the acute stage the treatment is largely pædic. It is useless to persevere with physiotl if the muscles feel hard, do not respond to stim of any kind, are silent on electromyography, proved on biopsy to be ischæmic. An efficient ap may be required to correct a slight degree of foo

To sum up, we advise prophylaxis by suitable gra training; and, when the condition is recognised ea recommend rest in bed with the limb elevated a foot splinted in the neutral position (at right angles leg). Once paralysis has developed, surgical i pression of the muscles should be undertaken emergency.

SUMMARY

A syndrome occurring in fit young men and con of ischæmic necrosis of the muscles of the anterio compartment of the leg, with a lesion of the a tibial nerve, is described.

In most of the published cases the onset of th drome can be directly related to physical ex involving strenuous use of the leg muscles. In 2 in the present series, however, the syndrome dev after a blood-transfusion into the affected limb.

The salient clinical features are pain in the of the leg, followed by signs of inflammation ov pretibial muscles and by inability to dorsiflex th and toes. Important negative findings are normal of the peroneal muscles and a minimal degree of foo due to contracture of the ischæmic muscles.

The pathogenesis of the syndrome is discus detail, and it is considered that the sequence of e is: unaccustomed exertion → muscle trauma → inc pressure within the anterior tibial compartme impaired blood-supply to the affected muscles → isch necrosis.

The anterior tibial nerve is involved either by pression, in which case it recovers rapidly, or by isch in which case the loss of function is permanent.

It is believed that the condition can be prevente graduated physical training. If the syndrome is recog early, rest alone may prevent irreversible damag the muscles; but, if paralysis has developed, su decompression of the anterior tibial compartment a emergency procedure is advocated.

Cases 1 and 2 were seen at the Military Hospital for Injuries, Wheatley, Oxford, and case 3 at Ashford Ho Middlesex (A. B. C.). Cases 4–7 were seen at the perip nerve-injury unit at the Wingfield-Morris Orthopædic pital, Oxford (R. B. Z.), and cases 8 and 9 at the neuro unit at Gogarburn Hospital, Edinburgh (R. L. R.). W indebted to Lieut.-General Sir Neil Cantlie, K.B.E., Dir General, Army Medical Services, for permission to r cases 1 and 2. Our thanks are also due to Dr. W. R Russell and Mr. H. J. Seddon for much helpful advice d the preparation of this paper, and to Dr. G. B. S. Ro (cases 1 and 2), Dr. R. E. M. Bowden and Dr. E. Gu (cases 4–7), and Dr. W. Blackwood (cases 8 and 9) for pathological reports.

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patient an ulcer on the index finger healed during cond course. In another a deep ulcer on an amputa- tump healed after four courses of treatment. In her case, with partial gangrene of the toes, healing lower; as treatment proceeded, the dead parts toes separated spontaneously and the ulcer then l.

ne intelligent patients reported that during hypo- mia they had a feeling of stronger blood-flow and th in their limbs. This started $1^1/_2$ hours after ion of insulin and continued for about 2 hours hypoglycæmia had been ended.

condition of these patients has not deteriorated treatment was discontinued. Their general health nproved and their appetite has increased. After nent they looked healthier and slept better than ; and their spirits rose—an important factor.

er treatment some cases still showed oscillometric ngs of zero at ankle-level, though the feet had ne warm and almost normal in colour and the ng distance had increased.

ore patients leave hospital they are told the nature eir disease and are warned of the importance of for their extremities. They are advised to seek tary work exposing them as little as possible to the of trauma and to cold. The less intelligent patients e written directions regarding the care of their All are urged to give up smoking.

CONCLUSIONS

e findings in this series suggest that it is worth g treatment by hypoglycæmia even in very advanced of thromboangiitis obliterans in which other methods atment have failed.

re protracted observation of a greater number of is needed; and the study reported here is being nued and extended.

seems that in this series treatment by hypoglycæmia account largely for the rapid healing of ulcers, ise in temperature and improved colour of the skin, the relief from claudication pain and other trophic ns. Admittedly, rest in bed and diathermy were tional factors contributing to the improvement of ollateral circulation in these patients, but some of had previously been treated by these and other ods without success.

may prove possible to maintain the improvement iving from time to time a further course of insulin nall doses.

SUMMARY

hromboangiitis obliterans has been treated by oglycæmia induced by insulin.

sulin was injected twice daily, in initial doses of 0 units in the morning and 60–80 units in the after- 1. Hypoglycæmia was terminated after 3 hours. routine was continued for 20 days, with a rest of t 10 days before the next course.

twenty consecutive cases improvement, usually nning during or after the first course, was evident, icularly *in the pronounced relief of trophic* urbances and rapid healing of ulcers.

ly thanks are due to the Director-General of Medical nces, Ministry of Pensions, for permission to publish this cle; and to my colleague, Dr. L. Szeszyncki, for his aboration in treatment.

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DEPARTURE OF SUBSTANCES FROM THE SPINAL THECA

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SINCE the introduction of spinal anæsthesia by Corning in 1885, the confines of the spinal theca have been invaded by an ever-increasing army of chemical substances. Quite apart from the many varieties of spinal anæsthetics, the past fifty years have seen the injection into the spinal subarachnoid space of saline solutions, therapeutic sera, penicillin, streptomycin, various gases and radio-opaque substances.

It is well known that many of these substances appear in the blood-stream soon after their injection (Reiner *and Schnitzler 1894, Hill 1896, Ziegler 1896, Dandy and* Blackfan 1913), but the route from theca to systemic circulation remains uncertain. Three main routes have been considered in the past:

1. Ascent into the cranial subarachnoid space, with subsequent absorption into the venous sinuses via the arachnoid villi.

This is the explanation most widely accepted today (Best and Taylor 1945, Mettler 1948, Johnston and Whillis 1946) and is derived mainly from the work of Quincke (1872), Key and Retzius (1876), and Weed (1914-15 and 1922). On this hypothesis, certain drugs such as penicillin are injected into the lumbar theca in the hope that they may reach the cephalic parts of the neuraxis in effective concentration. On the other hand, when a spinal anæsthetic is administered by the same route, no significant cephalic spread is anticipated even when the "continuous" technique is adopted. This apparent discrepancy is overcome by postulating that a spinal anæsthetic becomes "fixed" to the neural elements within the theca (Stout 1929). There is neither convincing proof nor accepted definition of "fixation."

2. Removal via the lymphatic drainage of the spinal subarachnoid space.

The lymphatics have rarely figured as main routes for the drainage of substances introduced into the cerebrospinal fluid (C.S.F.). Both Quincke (1872) and Key and Retzius (1876) thought that lymphatic drainage was of small importance compared with drainage through the cranial arachnoid villi. This view was endorsed by Dandy and Blackfan (1913) and Weed (1914-15). Cathelin (1912) was one of the few who claimed an important place for the lymphatics in the absorption of C.S.F.

3. Direct passage into the local venous drainage of the spinal theca.

Direct local venous drainage of the subarachnoid space was suggested by Dandy and Blackfan (1913), who affirmed that C.S.F. passed directly into the blood by diffuse absorption from the entire arachnoid membrane. Howe (1929) believed that the main route of exit was directly through the vessel walls. Mott (1910) held that the C.S.F. was largely absorbed into the cerebral blood-vessels, while Dandy and Blackfan (1913) maintained that absorption by the spinal arachnoid accounted for a considerable fraction of the total. Weed (1914-15) claimed that spinal drainage was of much less significance than drainage through the cranial arachnoid villi, but Weigeldt (1921) agreed with Dandy and Blackfan (1913). More recently Johnston and Henderson (1932) and Hunter (1946) tentatively suggested that a proportion of an injected spinal anæsthetic was absorbed by the intra-course; the toes became reddish and somewhat warmer. Walking distance increased up to about 350 yards.

Examination on Aug. 20, 1949, showed no deterioration. The patient is now working as a cobbler.

Case 2.—A storekeeper, aged 31, had phlebitis in both legs in March, 1947. After a few months of treatment this subsided but claudication pain continued in the right leg. In March, 1948, the right foot became dark blue and cold, and ulcers developed on all the toes. In the next 4 months claudication and rest pain increased despite various treatments; and he was advised to have the limb amputated.

He was admitted on July 3, 1948. Formerly a rather heavy smoker, he had smoked only moderately during the last few months. His general condition was poor; he was pale and looked tired. The right foot was cold and cyanotic; with deep ulcers on all the toes. Pulsation of the dorsalis pedis artery was just palpable. He could walk only 20 yards, and rest pain was severe; he was receiving morphine every night.

Between July 6 and Oct. 31, 1948, four courses of treatment were given. From the 7th day of treatment the rest pain began to improve, and by the end of the first course it had disappeared completely and all the ulcers had healed, though the bone of the terminal phalanx of the big toe protruded. This was removed after the second course, and thereafter the wound healed in a few days. The foot and toe gradually became warm and of normal colour; and pulsation in the dorsalis pedis artery became equal to that on the unaffected side. Walking distance increased to about 1000 yards, after which claudication pain was only slight. The nails began to grow.

Examination on Jan. 24 and May 15, 1949, showed no deterioration. The patient complained only that in the winter his right foot was sensitive to cold and he had to wear warm socks. He was working as a storekeeper.

Case 3.—A butcher, aged 44, had had claudication pain in both legs since 1943. Periarterial sympathectomy on both femoral arteries brought about some improvement; but in November, 1947, he developed severe claudication and rest pain in his right foot. In February, 1948, the toes of his right foot became gangrenous. In March he underwent right lumbar ganglionectomy, and a month later the right leg was amputated below the knee. In July he began to complain of severe claudication pain in the left leg; and in November an ulcer appeared on the left big toe, and he was suffering severe rest and claudication pain.

The patient was admitted on Dec. 1, 1948. Formerly he had smoked about 20 cigarettes daily, but lately much less. His general condition was poor. The left foot was dark blue and cold; the distal part of the foot and the toes were swollen, and there was a deep and extensive ulcer on the big toe. No pulsation was palpable in the popliteal or dorsalis pedis arteries. His walking distance was about 15 yards; rest pain was severe, and the patient could not sleep without sedatives.

Between Dec. 7, 1948, and July 10, 1949, he was given six courses of treatment. From the 9th day of treatment the rest pain diminished, disappearing in a further few days. The ulcer on the big toe healed during the first course of treatment; the foot became gradually warmer and normal in colour; the toes became red and somewhat warmer, though not constantly so. Pulsation appeared in the popliteal artery. Walking distance increased to about 400 yards.

Examination on Aug. 25 showed no deterioration. Walking distance was perhaps slightly longer.

Case 4.—A general labourer, aged 36, had had his left leg amputated below the knee in 1944, following gangrene of the foot. In 1946 the right lower leg was amputated for the same reason. Early in 1947 a deep ulcer and subsequently gangrene developed in the left stump; and in May of that year amputation above the left knee was carried out. In January, 1948, the right stump became ulcerated; and in May the patient underwent right-sided ganglionectomy.

He was admitted on Sept. 1, 1948. On the right stump, below the knee, there was a deep ulcer $1^3/_4 \times 1^1/_2$ in., covered with atonic granulations. The stump was bluish and cool to the touch. Between Sept. 8, 1948, and Jan. 7, 1949, four courses of treatment were given. The ulcer gradually got smaller and finally healed. The stump became warmer and normal in colour. Examination on May 3 showed a good scar.

Case 15.—A schoolmaster, aged 40, had [illegible] tion pain in the right lower leg in 1942. In 1945 the lower leg was amputated owing to gangrene, and amputations followed; the wound showed no ter heal. In 1946 he underwent left lumbar [illegible] for claudication pain in the left leg; improvement lasted for a few months. During 1948 both hands became and the right index finger was amputated on account gangrene.

The patient was admitted on June 15, 1949. Formerly rather heavy smoker, he had stopped smoking a few mo before. He looked pale and tired. On the left side the d part of his foot and the toes were cold, swollen, and reddi blue; there was a deep ulcer on the third toe, and the n were hard and not growing; no pulsation would be felt in t dorsalis pedis artery. Walking distance was about 100 yar The patient complained of rest pain in the toes and he co not sleep without sedatives. Both hands were cold reddish-blue; pulsation in the left radial artery was palpable and in the right radial artery hardly so. On the index finger there was a deep ulcer $^1/_2$ in. across. Even slight movement produced effort pain in both forearms hands. The patient could write only a few words of severe pain, but he could continue after 2 minutes' he was unable to shave himself.

Between June 21 and Aug. 10 two courses of [illegible] given. Rest pain in the toes disappeared after 16 days' ment; and the ulcer on the third toe healed on the 12th The ulcer on the left index finger healed during the sec course. The foot became warm and of normal colour; toes became red and somewhat warmer, and the swell subsided. Walking distance increased to 250 yards. B hands became warmer and almost normal in colour. patient can now write and shave without pain. Treatment being continued.

RESULTS

Each of twenty consecutive cases of thromboangi obliterans, observed over a period of 14 months, respond favourably to repeated transient hypoglycæmia, indu by insulin, other methods having failed. In each th was well-marked improvement of collateral circulat The response was slow but usually became evid during or after the first course.

Improvement was manifested by relief of rest pa warmer and more normally coloured skin, relief fr claudication pain (complete in four cases), lengtheni of walking distance to a minimum of 350 yards, improv growth of nails and appearance of hair growth the dorsum of the toes, and improved genc condition.

Of the twenty patients, nine who had severe r pain reported great relief after only a few days' tre ment. In every case but one rest pain disappea completely before the end of the first course; and in t one case pain was relieved after two courses.

In all cases the skin-temperature of the affected lim rose slowly as treatment proceeded. At the same t the cyanotic or reddish-blue discoloration changed to more normal pink. These changes developed first in t upper parts of the limbs, spreading distally. Sup ficial veins became visibly distended. In three patie pulsation reappeared in the dorsalis pedis arteries, one patient in the popliteal artery and in one patient the posterior tibial artery.

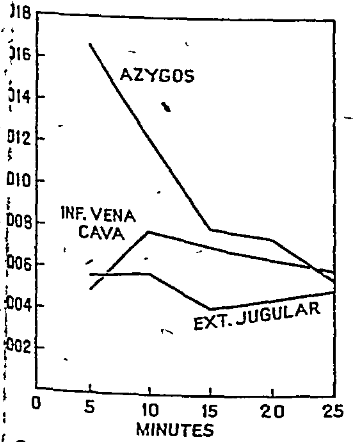
In six cases where the arms were involved the sk became warmer and the fingers and hands were restor to almost normal colour; œdema and numbness we lessened; and the patients reported that fine mo ments of the fingers, which before treatment had be clumsy, returned almost to normal and their grip beca stronger. Probably because the changes were mild upper limbs improved rather more quickly than low limbs.

In six cases ulcers of the toes healed during the fi course of treatment; healing was surprisingly quic figures are among the highest recorded for cisternal after the lumbar injection of any of the tested ances. It was evident that cephalic extension ttle to do with the reduction in local concentration. w of the small capacity of the theca in the cat, it lear that simple dilution would not account for the ntration decrement. The sampling, too, involved small volumes that this could not be considered a s source of loss.

II (*preliminary work*)

inage of the spinal subarachnoid space by the s route was investigated in twelve cats. Initially moprocaine was introduced, and to prevent possible ge of the injected solution round the needle into the ral tissues it was given by sacral cannulation. each animal samples of blood were obtained at ac intervals from the veins most likely to drain the l subarachnoid space—the vertebral, the internal external jugular, and the inferior and superior cavæ. Samples from the femoral artery and vein taken as controls. The sample of blood withdrawn any of these sources never exceeded 2 ml.

superior vena cava was cannulated at its commence- cephalic to the entrance of the vena azygos, by means of a 'Perspex' tube introduced via the right innominate vein. The inferior vena cava was cannulated via the right femoral vein, the tip of the tube reaching the level of the diaphragm. These positions were ascertained by previous measurements on dead animals and confirmed at necropsy.



—Concentration of sodium radiophosphate in veins after intrathecal injection.

The concentration proved to be similar in all these vessels except the erior vena cava, where the level was slightly er.

es II (*completed*)

he last vein to be studied was the azygos vein,* ch was cannulated just before its junction with the erior vena cava after exposure by resection of the ropriate right ribs. Respiration was maintained ficially with a pump.

reliminary experiments, in which dibromoprocaine introduced into the lumbar subarachnoid space, wed that the azygos vein carried a greater con- ration than any other vein examined. To reduce ical interference and the blood-loss attendant upon h extensive sampling, various groups of veins were npared with the azygos vein as regards the blood ncentrations within them—a procedure which appeared tifiable, since, as already mentioned, the drug levels re similar in all the other veins except the superior na cava. A commonly used combination was superior na cava, inferior vena cava, and azygos vein, so that e azygos drug level could be compared with that esent in the total cephalic and the total caudal ainage.

Dibromoprocaine appeared in the venous system most immediately, but the azygos vein carried a greater concentration than either the inferior vena cava or the superior vena cava (fig. 2), and indeed a greater concentration than any other vein examined. This immediate appearance of the substance in the circulation speaks strongly against the spread of the substance to the cranial subarachnoid villi, which must occupy an appreciable time. The question arose whether radiosodium, radiophosphorus, and radiobromine departed from the lumbar subarachnoid space in the same way as dibromoprocaine. Figs. 3*a*, 3*b*, 4, and 5 suggest that they did.

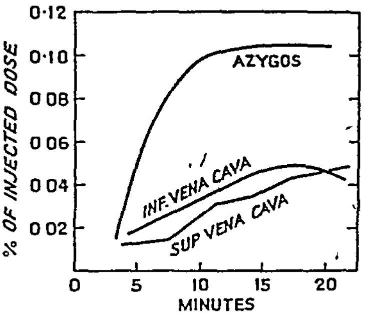


Fig. 5—Concentration of sodium radiobromide in veins after intrathecal injection.

DISCUSSION

The relative importance of the part played by the azygos vein in the total venous drainage of the spinal subarachnoid space is difficult to assess, for we have no precise information about the velocity of blood-flow in this vessel. In view of the large size of the azygos vein in the cat it seems likely that the volume of blood it carries is large. This point is being investigated, as is also the microscopic anatomy of the spinal arachnoid. Rapid removal by direct venous drainage would explain why the concentration of penicillin in the cisterna magna is so low after penicillin has been introduced in relatively huge concentration into the lumbar subarachnoid space (Walker and Johnson 1946); and it would partially explain why the medullary centres are not paralysed in patients subjected to spinal anæsthesia. The fate of intrathecal penicillin is being examined.

The distribution of various substances in those veins which can reasonably be expected to drain the spinal theca suggests that there is a direct venous drainage. The fact that a substance appears in higher concentration in the azygos system than in the venæ cavæ could theoretically be due to a depression of caval level rather than a rise in azygos level. Such a depression might be caused by removal of the substance from the arterial blood by the tissues through which it passes on its way to the venous channels. The defence against such criticism rests on the following points:

1. The tissues through which the blood returning to the superior vena cava passes are in the main different from those traversed by blood en route for the inferior vena cava. Nevertheless the blood levels in the superior and inferior venæ cavæ are very similar, except with dibromoprocaine where that of the superior vena cava is above that of the inferior vena cava.
2. Similar results have been found with dissimilar substances —sodium, phosphorus, and bromine; and it is generally accepted that no tissue specifically concentrates bromine, which is distributed throughout the extracellular body fluids.
3. None of the veins which could reasonably be expected to drain the spinal theca shows any significant differences in blood levels with the exception of the azygos.

There is a further point. The act of withdrawing blood from the azygos vein with a syringe, however carefully this is done, might possibly produce an unduly low venous pressure in the azygos system and hence promote an abnormally rapid flow of substance from theca to vein. To counter this the following experiment was performed:

The right auricle of an anæsthetised cat was cannulated via the right innominate vein, and after exposing the azygos vein an artery clip was placed upon it. An injection of radioactive dibromoprocaine was now administered by sacral cannulation and samples of auricular blood withdrawn at

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By azygos vein is meant that vein which drains the entire azygos complex into the superior vena cava.

thecal capillaries, while Goldberg et al. (1943) also regarded direct vascular absorption as the main route of departure of such substances.

In many of the investigations on which these conclusions were based, the substances introduced into the spinal subarachnoid space were such as would never appear there otherwise. Thus Key and Retzius (1876) employed coloured gelatin; Quincke (1872) used cinnabar; Reiner and Schnitzler (1894) and Weed (1914-15) injected potassium ferrocyanide; Hill (1896) and Horbatsky (1916) chose methylene-blue; while Dandy and Blackfan (1913) used phenolsulphonephthalein. Other materials were mercury (Cotugno 1770), carmine granules (Flexner and Amoss 1914), and indian ink which has often been employed in examinations of the spinal theca. The use of such foreign substances was criticised by Levinson in 1919.

INVESTIGATION OF LOCAL VENOUS DRAINAGE

A critical proof of the direct venous drainage of the spinal subarachnoid space has never been given; indeed Weed (1922) categorically denied the possibility of diffuse absorption by vessels of the spinal subarachnoid space, since he was unable to detect histologically any traces of his "foreign substance" in the mesothelium covering the vessels. We shall here describe our own observations.

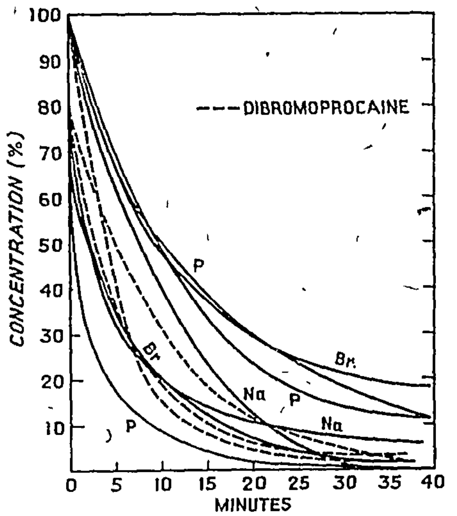

Fig. 1—Concentration curves for sodium, phosphorus, bromine, and dibromoprocaine after their injection into the spinal theca. There is an initial rapid reduction in concentration followed by a more gradual decline. (100% represents the concentration of the injected substance.)

Series I

We began by investigating the degree of cephalic spread of a substance administered intrathecally. Radioactive dibromoprocaine (Howarth 1948) was introduced into the lower reaches of the spinal subarachnoid space and its rate of departure observed. It was introduced either by lumbar puncture or by direct cannulation of the subarachnoid space where the theca lies over the sacral promontory. A hypodermic needle was inserted into the cisterna magna for sampling. Subsequently other substances were employed to ascertain whether their behaviour resembled that of dibromoprocaine. These were radiosodium as sodium chloride (0·9%), radiophosphorus, as a mixture of monobasic and dibasic sodium phosphate (1–3%), and radiobromine as sodium bromide (1%). They were given in neutral solution, the injected volume varying between 0 25 and 0·5 ml. Thirty

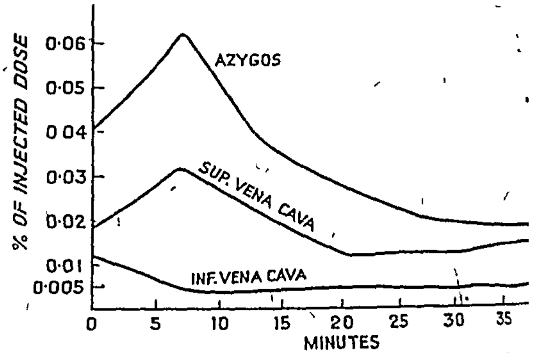

Fig. 2—Concentration of dibromoprocaine in veins after intr injection.

cats were used, and the experiments were cond under pentobarbitone anæsthesia (30 mg. per intraperitoneally.

The introduction in each instance occupied ap mately half a minute; so the pressure of injectio low, and the probability of rupture of any of th arachnoid prolongations was minimised. Where ca tion was performed, the caudal end of the theca co inspected during injection, and its flaccidity ind that the contents were not under abnormal pr After the radioactive substance had been intro samples of 0·02 ml. of C.S.F. were collected in a pipette from the needle or cannula in the lumba arachnoid space at specific intervals, the butt dried with a wisp of cotton-wool before taking sa Each sample was made up to 10 ml. with wat subjected to radio-assay. Specimens of cisternal were similarly obtained, but 0·1 ml. samples collected, because of the low concentrations found results from the lumbar theca were graphed, th centrations being expressed as a percentage concentration of the injected solution (fig. 1).

Allowing for individual variations among the an and the differing concentrations of the injected sol the curves suggest that all these substances depar the lumbar spinal theca in a similar manner. significant feature is that in no case was a concent found in the cisternal C.S.F. which could account f rapid decrement in concentration in the lumbar In the cisternal C.S.F. the maximal concentratio often so low as to render assay impracticable (less 0·0002%).

Thus in 43 minutes the concentration of s bromide in the lumbar theca had dropped to that originally injected. During this period a se samples of cisternal fluid expressed in the same showed the following concentrations:

0; 0; 0·004; 0·004; 0·01; 0·02; 0·02; 0 02.

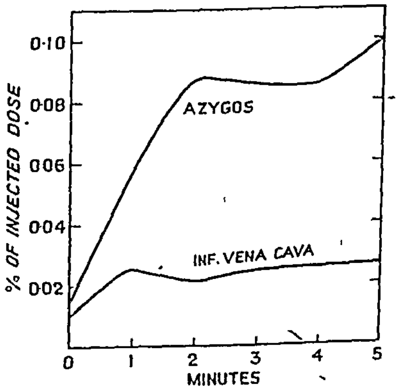

Fig. 3a.

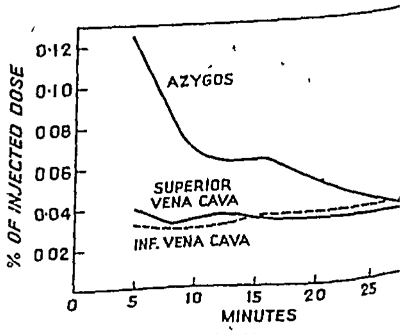

Fig. 3b.

Figs. 3a and b—Concentration of radiosodium cl in veins after intrathecal injection.

hœa, and 3 no clinical signs. Only 3 were followed until tive, the duration of known infection being nine weeks, han two weeks, and probably less than a week.

derby (3).—One child had had two earlier attacks of hœa and vomiting, but was normal when examined; thers had had no gastro-intestinal upsets. The duration fection was not followed.

chester (1).—The child had no clinical signs; the organism solated only once in five examinations, the infection being rently transient.

bovis-morbificans (8).—Seven children belonged to the mic series and had had gastro-enteritis either before or examination. The eighth child was from the clinic in the postepidemic period; he had no clinical signs remained infected for four weeks.

muenchen (2).—Both cases were neonatal and both parent; their infections lasted three and more than weeks.

bareilly (1).—The child had had three attacks of mild hœa in the two months before examination but was ng weight normally. The duration of infection was not red.

pullorum (1).—This infection was completely unapparent, the organism was found only once—at the second of examinations.

adelaide (5).—One child had had mild diarrhœa; the cases were unapparent and with negative histories. cases were followed through, the infections lasting ten, than three, two, and two weeks from the first nination.

ORIGIN OF INFECTIONS

e lack information to suggest how most of these ies became infected. They came from widely scattered s of Brisbane, with no association between infections pt possibly in some of the institutional cases. Three of records are, however, of interest:

baby received her infection with *S. muenchen* from her her at or soon after birth, and it was transmitted, presum- by the staff, to another baby in the same nursery ckerras and Mackerras 1949b).

baby, aged 3 months, was infected with *S. adelaide*. The nts were clear (3 negative specimens from each); the ehold was clean, and no positive cultures were obtained n food, utensils, dust, &c.; rats entered the house from a ny infesting uncleared ground nearby, and one of them was d to be infected with *S. adelaide*. These examinations e made late in the child's infection.

baby, aged $2^1/_2$ months, was found infected with *S. adelaide* Oct. 7. Its mother and its sister were negative. Three ks later all 3 were found to be infected. The baby may e been infected from an unknown source and have passed infection to the others.

part from these indications we can only note that except for the first neonatal *S. muenchen* infection, all infected babies were either artificially fed or received e supplemental feeding; and (2) there were sufficient nonella carriers (3%) in the adult human population in rats (1·5%) for either to have served as sources the babies' infections (Mackerras and Mackerras 9a), though no direct associations were found other n those noted.

DISCUSSION

he chief point of interest in these observations is the remely low pathogenicity of all species of salmonella Brisbane at present. There were 19,000 children under e age of 2 years in the metropolitan area at the end of 48 (Mr. S. E. Solomon, Government statistician, rsonal communication). If our clinic records approxi- ate to a random sample, there would have been upwards 600 salmonella infections scattered through this section the population during the period of the survey; t only 33 cases of salmonella gastro-enteritis were eated in hospital. Even *S. typhi-murium*, which can ndoubtedly cause severe illness, seems to have done o only in a minority of recent infections. We do not now why this is so; but we suspect that relative enignity is the normal state of the organisms, and that athogenicity is associated either with dosage of infection or, more probably, with selection by passage of virulent mutants. The conditions under which epidemics arise certainly favour the latter hypothesis.

Benignity of most endemic salmonella infections is not confined to Queensland. Rubbo (1948) doubted the capacity of the Melbourne strain of *S. derby* to kill, unless it was associated with some concurrent severe illness, and Dr. John Perry (personal communication) has also encountered many unapparent infections in a recent hospital survey in Melbourne. The phenomenon is probably general, and it is of considerable epidemiological significance, because infection may be widespread in a community but completely unsuspected and therefore not attacked. There is, in fact, a permanent potential epidemic risk, and it is easy to understand how epidemics often arise when children are crowded together under conditions which favour spread from child to child (Brehme 1948).

We feel that this infant carrier-rate of salmonella infections is just as important in the community as typhoid and dysentery carrier-rates in older persons. It certainly should receive close consideration in any plan of prevention.

SUMMARY

A salmonella carrier-rate of about 3·5% in children under the age of 2 years in Brisbane is recorded. Though the organisms seem normally to be benign, they constitute a permanent epidemic risk.

Our thanks are due to Miss Mary McCaffrey for much help in the laboratory work, and to Miss Nancy Atkinson, of the Institute of Medical and Veterinary Science, Adelaide, for identifying the strains of salmonella isolated.

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EFFECT OF THE HEAD-DOWN POSITION ON THE CIRCULATION IN HYPOTENSIVE STATES

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In the treatment of traumatic shock the clinical improvement which sometimes follows elevation of the foot of the patient's bed is generally assumed to be the result of increased blood-flow to the brain and of acceleration of the venous return from the lower part of the body. Until recently it has been customary to express these changes in terms of pulse-rate and of arterial blood-pressure, and clinical experience suggests that in most cases this is a reliable method.

However it is possible that blood-pressure records do not always truly indicate the blood-flow when the blood-pressure is low. Under high spinal anæsthesia, very low, or even unrecordable blood-pressures have been associated with apparently good oxygenation of the tissues, and recovery without obvious ill effects has followed (Griffiths and Gillies 1948).

The present study was undertaken to measure the effect of the 18° head-down position on the cardiac output and blood-pressure of animals in a hypotensive state.

Cardiac Output.—Fick in 1870 first pointed out how the cardiac output could be calculated from the gaseous exchange of

5-minute intervals. When three samples had been taken the clip was removed and three further specimens were collected. Radio-assay showed that after the removal of the clip the concentration of dibromoprocaine in the right auricle rose appreciably:

0·3–0·3–0·4—*clip off* 0·5–0·5–0·6 μg/ml.

in spite of the fact that the azygos concentration after the last sample, thirty minutes after administration, was only 0·6 μg./ml. The experiments also showed that the clamp upon the azygos vein did not deny the drug access to the circulation.

CONCLUSION

We conclude that in the cat the venous channels are a direct route of drainage from the spinal subarachnoid space. Of the veins examined, the azygos vein carries the highest concentration of substances introduced into the spinal theca.

We are grateful to Prof. A. D. Macdonald and Prof. G. A. G. Mitchell for facilities and criticism. The expenses were defrayed by the Medical Research Council to whom thanks are due.

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INFANT SALMONELLA CARRIERS

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MILD or unapparent salmonella infections in infants have sometimes been recorded—e.g., by Angrist and Mollov (1946)—but they seem to have attracted little attention, and the general impression gained from published reports is that these organisms are highly pathogenic to the very young. Evidence which we have obtained recently in Brisbane, however, points to a striking contrast in the behaviour of epidemic and endemic infections.

In the epidemic series (Mackerras and Mackerras 1949a) all the children under the age of 2 years from whom *Salmonella bovis-morbificans* was isolated, had had at some stage an active, usually severe, gastro-enteritis, and the organism was found in their fæces during the incubation period, throughout the clinical illness, and up to six months after clinical recovery. About 40% retained their infections for less than a month, 25% for one to two months, and 35% for more than two months. Infections in older children and adults were mild or unapparent and generally transitory.

SURVEYS OF CHILDREN UNDER THE AGE OF 2

Group	No. of children	No. of specimens	Salmonellæ isolated
State home, 1947 ..	36	50	1 *S. bovis m* 2 *S. adelaide* 1 *S. pullorum*
State home, 1948 ..	23	23	Nil
Housing camps, &c. ..	17	23	1 *S. adelaid*
Maternal and child-welfare clinics ..	428	551	1 *S. paratyphi B* 7 *S. typhi-m* 3 *S. derby* 1 *S. chester* 1 *S. bov* 1 *S. bareilly* 2 *S. adelaide*
Total	504	647	21 strains (4%)

In addition, 6 *S. bovis-morbificans* were found in a ward of children under [illegible] ital for [illegible] tions other than [illegible], 2 *S* [illegible] *murium* in 27 chil [illegible] ver [illegible] epidemic, and 2 *S. muenchen* in week-old infants in a hospital.

Other species of salmonella were not infrequent in the same age-groups at the same time. They were scattered sporadically in the community, associated with gastro-enteritis in infants, but with little or no clinical indication of their p at any age. As a rule, these infections were relati transient, though they persisted longer in infants th in older persons. It is with the endemic infections young children that we are concerned here. Some the observations have been used incidentally in cussing the mode of spread of the epidemic (Macke and Mackerras 1949a), but they are felt to be of suffici general interest to justify a separate account here.

RESULTS OF SURVEYS

All the specimens were plated on 'Difco SS' and inoculated into tetrathionate broth, which in was plated on SS agar next day. Our findings are se in the accompanying table.

The first three groups shown in the table were stu in connexion with the epidemic, but directed our at tion to the problem; the fourth was examined specific to define it. Dr. H. C. Murphy, director of maternal child welfare, arranged for specimens of fæces to submitted to us from a continuous series of inf admitted to the clinics under his control. These child were mostly "feeding problems" but were comple unselected as regards "bowel upsets"; some had a p history of diarrhœa, some had loose motions while und observation, and most had normal stools; none w ill enough to be sent to hospital. In Dr. Murphy opinion they were a representative sample of that p of the infant population which is admitted to the clin The survey reported here lasted from March 10, 1 to May 4, 1949.

Sixteen strains of salmonella were isolated from infants in this series, 1 infant having a *S. typhi-mur* infection followed by infection with *S. adelaide* an later by another with *S. typhi-murium* four months aft the first. The over-all incidence was 3·5%. Infectio were scattered irregularly throughout the year, wi most of them in the hotter months: January, February, 1; March, 2; April, 1; May, 1; June, September, 1; October, 1; November, 1; December, They are too few to have statistical meaning in relatio to season.

The following brief analysis, by species of salmonell is based on all the infections recorded in the table an beneath it:

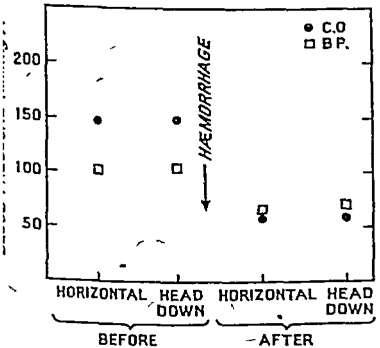
S. paratyphi-B. (1).—The child had had mild diarrhœ a fortnight previously, but had not been put to bed, and w normal when examined. It was still infected and still w when lost sight of eight weeks later.

S. typhi-murium (9).—One child had had clinical gastr enteritis five weeks previously, 5 had had intermittent m ırdiac catheter was passed into the right jugular and onwards into the right atrium. The position of ip of the catheter was determined by manometry the method of McMichael (personal communica- . A cannula was inserted into the carotid artery, arterial blood-pressure was recorded on a kymograph. noral artery was cannulated for arterial blood samples for bleeding. Heparin in doses of 1000–3000 units administered to prevent clotting in the cannulæ.

fore bleeding, two control estimations of cardiac ut were made: one in the horizontal position, and after the trunk and lower limbs of the animal had raised to an angle of 18°, this being considerably er than the tilt obtained clinically by placing 45 cm. ks under the foot of the bed. A special tilting table used for this manœuvre in which the axis of tilt cided with the position of the blood-pressure cannula ie carotid artery (fig. 1). Artificial changes in blood-sure due to variations in level of the carotid cannula thereby avoided.

he animal was bled from the femoral artery till the d-pressure fell to about 50 mm. Hg. The amount of d removed varied from animal to animal according body-weight and unknown factors. The average unt was 32% of the calculated blood volume.

wo further estimations of cardiac output were next le, in exactly the same circumstances as before norrhage. Judgment was called for in deciding the nent to take the blood samples; for example, after hæmorrhage there was a compensatory rise in blood-pressure, due no doubt to vasoconstriction. It was essential to allow this effect to reach its maximum before estimating the cardiac output. Again, after tilting, a gradual improvement in the circula- due to increasing venous return, might be antici-ed, and it was necessary to allow for this. In practice 15 minutes was allowed to elapse between any nœuvre and estimation of the cardiac output. All d samples were taken under liquid paraffin, and the gen content was estimated within six hours.



3—Effect of head-down positions on cardiac tput and blood-pressure of cat 10 before and er hæmorrhage.

t the end of the experiment the animals were llessly destroyed by bleeding.

nal Anæsthesia

he procedure in the experiments on high spinal sthesia was the same as in the hæmorrhage experi-ts, except that all the animals were in the prone ition, and instead of being bled each animal was n high spinal anæsthesia by the intrathecal injection % procaine hydrochloride in doses of 5 mg. per kg. body-weight.

rces of Error

mount of Hæmorrhage.—To reduce the blood-pressure bout 50 mm. Hg. it was necessary to remove different umes of blood from the animals; it may therefore supposed that they had different degrees of oligæmia. refore the results from one animal may not be ctly comparable with those from another. However, changes in cardiac output noted for each an are certainly valid for that experiment; and, since the investigation was not on oligæmia but on hypotension due to hæmorrhage, there is justification for comparing the results of the series.

TABLE III—EFFECT OF 18° HEAD-DOWN POSITION ON CARDIAC OUTPUT OF CATS BEFORE AND AFTER HÆMORRHAGE

Cat no.	Cardiac output (ml. per kg. of body-weight)			
	Before hæmorrhage		After hæmorrhage	
	Horizontal	Head-down	Horizontal	Head-down
1	218·3	225·2	61·9	52·1
2	145·4	139·0	23·3	30·0
3	88·4	85·4	54·2	45·7
4	74·0	76·0	46·3	44·2
5	110·0	109·0	53·2	59·6
6	263·3	258·6	69·0	71·3
7	207·5	205·2	50·0	80·2
8	108·7	122·0	73·2	73·3
9	121·5	120·0	39·0	41·6
10	147·5	150·0	57·2	56·8
Mean	148·46 ± 19·5	149·04 ± 19·1	52·73 ± 4·6	55·48 ± 4·5
	Mean difference = 0·58 S.E. of difference = ± 27·29		Mean difference = 2·75 S.E. of difference = ± 6·4	

Technique of Spinal Anæsthesia.—A similar source of error is present in the experiments on high spinal anæsthesia. There was no way of judging the level of anæsthesia, since the animals were under pentobarbital. It was not always possible even to be sure that the procaine solution was injected into the subarachnoid space, since cerebrospinal fluid could not always be aspirated from the needle. The fall in blood-pressure was taken as the indication of the effectiveness of the spinal anæsthesia, and it must be admitted that this is open to criticism. However, since the insertion of the needle and the injection of the procaine solution were the only obvious variables which preceded the hypotension, it seems reasonable to relate the two.

Estimation of Cardiac Output.—Estimation by the Fick principle is a well-established experimental procedure with its own experimental error, but it may be worth while to mention that leakage in the spirometer circuit can be a source of serious error. Great care must be taken to ensure that the junctions of the CO_2-absorber are completely airtight and that there is no leakage round the endotracheal catheter.

RESULTS

Low Blood-pressure due to Hæmorrhage

In dogs (tables I and II and fig. 2) the mean cardiac output per minute in the 10 animals was 188·4 ml. per kg. of body-weight in the horizontal position, and 177·3 ml. per kg. in the tilted position. After hæmorrhage

TABLE IV—EFFECT OF 18° HEAD-DOWN POSITION ON BLOOD-PRESSURE OF CATS BEFORE AND AFTER HÆMORRHAGE

Cat no.	Blood-pressure (mm. Hg)			
	Before hæmorrhage		After hæmorrhage	
	Horizontal	Head-down	Horizontal	Head-down
1	130	130	62	55
2	118	118	42	50
3	128	114	56	47
4	136	150	54	54
5	100	100	48	58
6	144	150	82	82
7	112	110	61	77
8	120	130	59	56
9	118	118	48	84
10	101	104	60	70
Mean	120·7 ± 4·5	122·4 ± 4·69	57·2 ± 3·14	63·3 ± 4·33
	Mean difference = 1·7 S.E. of difference = ± 6·5		Mean difference = 6·1 S.E. of difference = ± 5·34	

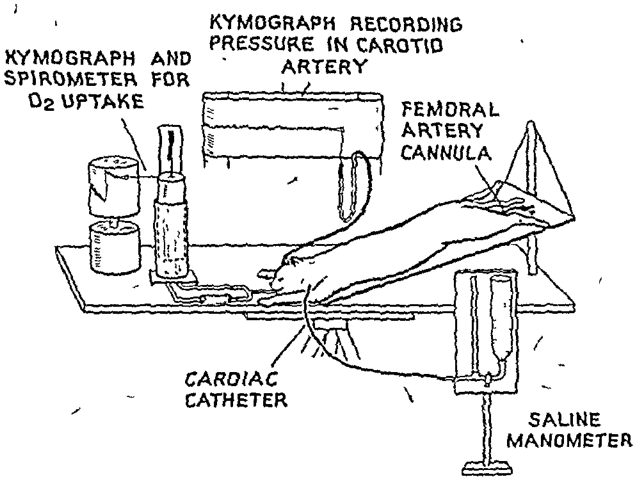

KYMOGRAPH RECORDING PRESSURE IN CAROTID ARTERY
KYMOGRAPH AND SPIROMETER FOR O2 UPTAKE
FEMORAL ARTERY CANNULA
CARDIAC CATHETER
SALINE MANOMETER

Fig. 1—Arrangement of animal in head-down position and of apparatus.

the blood. We have not found any published report on the effect of the head-down position on the cardiac output in hypotensive states. Blalock and Harrison (1927) and Burch et al. (1930) compared the effects of hæmorrhage on cardiac output under ether and under spinal anæsthesia but did not introduce postural changes. Grollman (1932), using the acetylene method, investigated changes in [illegible] sitting, and erect—in man and showed th[illegible] no effect on cardiac output owing to readjustment of the circulation. Wiggers and Werle (1942) studied the changes after hæmorrhage in laboratory animals. Cournand et al. (1943) similarly studied the circulation in cases of injury in man with various degrees of shock but did not assess the effect of posture.

TABLE I—EFFECT OF 18° HEAD-DOWN POSITION ON CARDIAC OUTPUT OF DOGS BEFORE AND AFTER HÆMORRHAGE

Dog no.	Cardiac output (ml. per kg. of body-weight)			
	Before hæmorrhage		After hæmorrhage	
	Horizontal	Head-down	Horizontal	Head-down
1	202	164	96	116
2	146	174	52	81
3	334	262	51	44
4	222	236	80	47
5	244	253	56	60
6	127	115	47	53
7	170	189	31	83
8	162	112	71	96
9	83	83	49	49
10	194	185	31	47
Mean	188·4 ± 22	177·3 ± 19·4	56·4 ± 6·5	67·6 ± 7·9
	Mean difference = 11·1 S.E. of difference = ± 29·32		Mean difference = 11·2 S.E. of difference = ± 10·24	

McMichael and Sharpey-Schafer (1944) also made experiments on the changes which follow movement from the erect to the supine posture in normal men but not in persons with hypotension. Wiggers and Middleton (1944) recorded the effect on cardiac output after hæmorrhage and reinfusion and showed that there was an approximate relationship between blood-pressure and cardiac index (cardiac output per square metre of body-surface). Stead et al. (1945) found that a 70° head-up tilt in normal men led to a fall in cardiac output.

Blood-pressure.—The relationship between blood-pressure and postural changes has been demonstrated both clinically and experimentally. Priorry in 1826 (cited by Hill 1895) and Salathé (1877) were among the first to report the therapeutic value of this position in averting death in circulatory failure, and this manœuvre has since been used repeatedly. Hill (1895) and Hill and Barnard (1897), adopting changes in blood-pressure as their criteria, studied postural influences in vasomotor paralysis. Henderson and Haggard (1918), as a result of experiments in man, concluded that a 45° head-down tilt did not bring about any well-marked change in blood-pressure. However, in further work on the circulatory effects of changes in posture in normal and in shocked dogs Beale et al. (1941) found that a 70° head-down position raised the blood-pressure. Gordh (1945) concluded, from published reports and his own experimental and clinical experience of circulatory dep under anæsthesia, that this position facilitates the flow blood to the heart. He regarded it as the best resusci procedure in these circumstances, and clinical imp support this view.

Thus, though the effects of posture on blood-pres and cardiac output have been recorded on severa occasions, its effect on cardiac output in different typ of hypotensive state do not seem to have been direct studied.

METHODS

Low blood-pressure was produced in one series animals by controlled hæmorrhage and in a second seri by high spinal anæsthesia induced by the intrathecal injection of a 1% solution of procaine hydrochloride in doses of 5 mg. per kg. of body-weight.

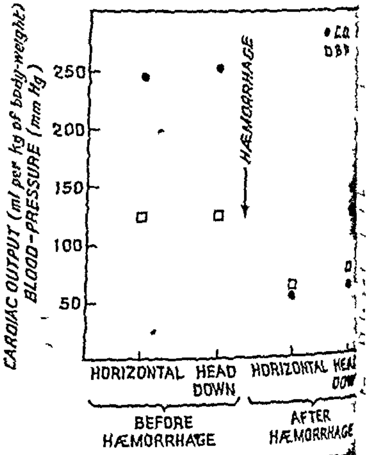


Fig. 2—Effect of head-down position on card output and blood-pressure of dog 5 before a after hæmorrhage.

It was originally intended to carry out both series of experiments in the dog, but the difficulty of thecal puncture in that animal made this impossible. According experiments on hæmorrhage were made in both the d and the cat, and those on spinal anæsthesia were m in the cat alone.

Arterial blood-pressure was recorded by cannulatio of the carotid artery, and cardiac output was estimate by the Fick principle. The arterial samples were take from the femoral artery, and the venous samples fro the right atrium by cardiac catheterisation. Blood oxygen estimations were made with the Van Slyk manometric gas-analysis apparatus. The oxygen co sumption of the animal was measured with a spiromete

Hæmorrhage

Anæsthesia was induced by the intravenous injectio of pentobarbital in doses of 32 mg. per kg. of body weight. The dogs were placed in the supine position an the cats in the prone position (fig. 1). The intratrache [illegible] wi catheter was then inserted [illegible] a stout ligature which prev

TABLE II—EFFECT OF 18° HEAD-DOWN POSITION ON BLOOD PRESSURE OF DOGS BEFORE AND AFTER HÆMORRHAGE

Dog no.	Blood-pressure (mm. Hg)			
	Before hæmorrhage		After hæmorrhage	
	Horizontal	Head-down	Horizontal	Head-down
1	125	120	55	75
2	130	130	50	70
3	180	180	75	65
4	145	145	55	45
5	125	125	60	75
6	106	106	50	60
7	145	145	75	100
8	140	123	56	62
9	140	140	30	30
10	140	132	40	62
Mean	137·6 ± 5·1	134·6 ± 6·3	54·6 ± 4·38	64·4 ± 5·31
	Mean difference = 3·0 S.E. of difference = ± 8·05		Mean difference = 9·8 S.E. of difference = ± 7·26	

REATMENT OF A LUNG ABSCESS BY INHALATION OF MICROPULVERISED PENICILLIN

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HAT topical application should be the most efficient hod of administering penicillin in the treatment of a lised infection has long been recognised. Since the ortance of this method was emphasised by Florey Florey (1943), numerous techniques have been ribed for delivering penicillin directly to the respira- mucosa. One of the most popular was developed Barach et al. (1945), and they described its use in abscess. In these methods a solution of penicillin nebulised by the pressure from a stream of oxygen from a hand pump.

lore recently a method of using penicillin inhaled in ry form has been described by Taplin and Bryan 47), who claim good results from a mixture of micro- verised penicillin, dextrose, and diphenhydramine lrochloride in a simplified suction apparatus, and from ir clinical and bacteriological studies deduce that this thod of administration is superior to others previously d. Krasno et al. (1947) describe a method in which icillin dust, contained in a small plastic cartridge with ine-mesh wire screen at the bottom, is fitted into a all container with a detachable mouthpiece, the whole paratus not being much bigger than a whistle and very ilar in shape. Penicillin 100,000 units can be inhaled this way in a few minutes.

Krasno et al. (1948) describe 357 cases of various ections of the upper and lower respiratory tract ated in this way with very striking results, among ich there was 1 case of lung abscess treated. h apparently a clinical cure. Toxic reactions and pleasant side-effects were remarkably few. These kers emphasise that additional measures, such as ramuscular and intravenous administration of peni- lin, and local and postural drainage, should not be lected.

In the case reported here the lung abscess developed spite of these measures, which, though persisted with, d not appear to contribute to the ultimate cure. The ficulty in treating conditions such as lung abscess has en to get the antibiotic *to the organisms in the* cavity sufficient amount to sterilise it and allow the ordinary parative agents of the body an opportunity to heal the vity. The apparatus described by Krasno et al. (1947) ems to provide the answer, and their method is cheap, mple, and efficient.

CASE-RECORD

On Nov. 22, 1948, a heavy man, aged about 49, with a id complexion accentuated by a malar flush, complained a sharp pain of sudden onset in the region of the right lung , made worse by breathing, and of general malaise, for nearly 24 hours. He had served in the army and police force most of his life, and had never been ill before. He had been discharged from the army in 1946 with "heart trouble," the cardiac condition apparently having been discovered on routine examination. He himself had never complained, and had continued working in a civilian capacity without symptoms up to the previous night, when this sudden illness had come on.

On examination he was found to have a right upper lobe pneumonia, with signs of early consolidation. His temperature was 100·2°F, his pulse was rapid and irregular, the rate being about 140 per min. His heart was slightly enlarged to the left, and he had auricular fibrillation. His blood-pressure was 135/90 mm. Hg.

Treatment.—He was treated with sulphadimidine ('Sulphamezathine') and procaine penicillin G 100,000 units eight-hourly, and was rapidly digitalised. His response to treatment was excellent, and within three days his pleural pain had disappeared, his temperature had become normal, his pulse-rate had dropped to 90 per min., and his pulmonary consolidation was resolving.

Progress.—On the morning of Nov. 26 he had a sudden attack of severe dyspnœa and slight precordial pain; about 10 min. later he was in a state of severe shock, his aspect was ashen-grey, his pulse was imperceptible, and his breathing short and laboured. He was practically in extremis. Cardiac infarction was tentatively diagnosed, and the patient was given 'Omnopon' gr. $^1/_3$ and atropine gr. $^1/_{100}$. He rallied but had a second severe attack within two hours. The morphine was repeated, and naso-oral oxygen was administered through a B.L.B. mask. The patient was nursed on a water-bed in Fowler's position, and the oxygen was administered continuously for four days and then gradually stopped. The morphine was repeated as thought fit, and the patient was kept absolutely quiet. He was still afebrile. By the end of ten days he had much improved, his pulse was still irregular though the rate was now only 80 per min.; and he was fully digitalised, a maintenance dose of digoxin 0·25 mg. daily being sufficient. His heart sounds were of fair intensity, and there were no murmurs. Both his lungs were apparently clear.

On Dec. 12 his temperature suddenly rose to 102°F and pulse-rate slightly increased. A diffuse pleural rub was audible over the left lower lobe and signs of early consolidation over the right lower lobe. Sulphadimidine and procaine penicillin G were again given eight-hourly. By the 16th fluid was clearly present over the right base, and a paracentesis thoracis revealed a clear straw-coloured exudate, apparently sterile. The pleural rub was still present on the left side, but there was no evidence of lung disease on that side.

Intramuscular penicillin 100,000 units daily was continued, the sulphadimidine being stopped after eight days. The effusion was aspirated at regular intervals. The evening temperature remained about 100–101°F but fell to normal in the morning. The patient looked toxic and began to lose flesh rapidly. A dry unproductive cough was partially relieved by a sedative mixture. It was now clinically apparent that he had developed a lung abscess on the right side.

Radiography on Dec. 30 showed no definite active disease in the left lung; an effusion at the right base, apparently not very big; some streaky loss of clearness of the upper half of the chest, probably due to pleural thickening; and some residual pneumonic changes. There was no evidence of active tuberculosis or of infarction on either side. There was probably fairly considerable cardiac enlargement.

Progress.—On Jan. 14, 1949, the patient, without warning, started to cough up, first some dark evil-smelling material, and then copious quantities of yellow pus. For the next thirteen days he continued to cough up about 1–1$^1/_2$ pints of pus in 24 hours. Postural drainage was attempted, but any position other than the upright caused much distress. However, the patient found that the left prone position helped. Penicillin was continued eight-hourly, with steam inhalations of tinct. benzoin. co., expectorant cough mixtures, and a diet of as high calorie value as the patient could stomach.

Radiography on Jan. 29 revealed a collection of fluid and air in the lower and outer part of the right lung, with a large cavity, containing a small amount of fluid, close to the lateral chest wall. There was some pleural thickening, extending up to the apex, and some loss of clearness below the clavicle. There was nothing definite on the left side. The heart was enlarged.

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TABLE V—EFFECT OF 18° HEAD-DOWN POSITION ON CARDIAC OUTPUT OF CATS BEFORE AND AFTER HIGH SPINAL ANÆSTHESIA

Cat no.	Cardiac output (ml. per kg. of body-weight)			
	Before anæsthesia		After anæsthesia	
	Horizontal	Head-down	Horizontal	Head-down
1	169·0	161·0	70·4	75·6
2	89 0	97·6	58·0	75·8
3	104·1	138·3	85·8	108·9
4	206·5	205·5	116·0	138·0
5	164 0	177·0	109 0	124·2
6	212·0	227·0	106·5	146·0
7	210·6	178·6	78·4	150 0
8	73·2	73·0	44 0	48·3
9	112·2	111·6	70·8	104 0
10	119 0	121·0	100·0	102·7
Mean	148·96 ± 16·87	149·06 ± 15·44	83·89 ± 7·66	107·35 ± 10·58
	Mean difference = 0·1 S.E. of difference = ± 22 87		Mean difference = 23·46 S.E. of difference = ± 13·07	

the mean cardiac output fell to 56·4 ml. per kg.—i.e., to less than half the control value. After tilting, the mean value rose slightly to 67·6 ml. per kg. The mean difference between the cardiac output in the horizontal and in the head-down position after hæmorrhage was 11·2 ml. per kg. Before hæmorrhage the same value was 11·1 ml. per kg. Neither of these values is statistically significant. The same is true of the mean blood-pressure values. A significant change in blood-pressure did not follow the use of the head-down position either before or after hæmorrhage.

In cats (tables III and IV and fig. 3) the results were similar to those obtained in dogs. The mean cardiac output before hæmorrhage was 148·46 ml. per kg. of body-weight in the horizontal position, and 149·04 ml. per kg. in the head-down position. After hæmorrhage the comparable values were 52·73 and 55·48 ml. per kg. Neither of the mean differences is statistically significant. Blood-pressure readings showed comparable variations.

Low Blood-pressure due to High Spinal Anæsthesia

In this group (tables V and VI and fig. 4) a rather different picture was seen. The mean cardiac output in the control period was 148·9 and 149·0 ml. per kg. in the horizontal and tilted positions—a difference of 0·1 ml. per kg. After high spinal anæsthesia the values were 83·9 and 107·35 ml. per kg.—a difference of 23·46 ml. per kg. This value is nearly twice the standard error of the difference and is almost statistically significant. The difference in blood-pressure values was more striking. Before spinal anæsthesia the difference between the means in the horizontal and tilted positions was 2·8 mm. Hg. After spinal anæsthesia the mean rise was 18·9 mm, which is a statistically significant increase.

TABLE VI—EFFECT OF 18° HEAD-DOWN POSITION ON BLOOD-PRESSURE OF CATS BEFORE AND AFTER HIGH SPINAL ANÆSTHESIA

Cat no.	Blood-pressure (mm. Hg)			
	Before anæsthesia		After anæsthesia	
	Horizontal	Head-down	Horizontal	Head-down
1	125	134	54	92
2	125	123	62	92
3	135	125	70	90
4	120	110	49	78
5	120	123	66	87
6	103	110	78	86
7	132	121	72	92
8	150	144	70	71
9	148	140	63	72
10	120	111	60	60
Mean	127·8 ± 4·45	125·0 ± 4·13	63·4 ± 3·08	82·3 ± 3·44
	Mean difference = 2·8 S.E. of difference = ± 6·07		Mean difference = 18·9 S.E. of difference = ± 1·6	

DISCUSSION

The results of the present study indicate that lit improvement in cardiac output and in blood-pressu results from adoption of the 18° head-down tilt in hyp tensive states following hæmorrhage. On the other han significant improvement results from the same manœuv in conditions of lowered blood-pressure in high spi anæsthesia. There are two essential differences betw the two conditions—in hæmorrhage the blood volume reduced, whereas in high spinal anæsthesia it is pres ably normal; and in hæmorrhage vasoconstrictor tone believed to be increased, whereas in high spinal anæsthe it is presumably diminished or absent. A considerati of these two points may explain why the head-do position has a different effect in the two conditions.

In hæmorrhage the chief cause of the low blo pressure and poor cardiac output is the reduced blo volume, which is not likely to be affected by gravity. high spinal anæsthesia, on the other hand, the cau the low blood-pressure is presumably widespread va dilatation, with stagnation of blood in the periph It may reasonably be expected that gravity would in the return of this stagnant blood to the right hea provided that a larger bulk of the body is elevated above the heart than is depressed below it. This was done in the present experiments. The increase in the venous return will raise both cardiac output and blood-pressure.

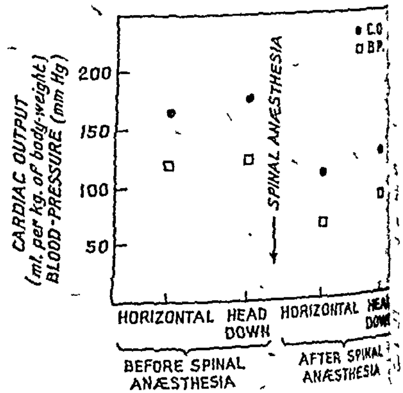

Fig. 4—Effect of head-down position on cardiac ou put and blood-pressure of cat 5 before and af spinal anæsthesia.

It is of interest that cardiac output and blood-pressur values were found to parallel each other fairly close in this study. Minor discrepancies were present whic might be due to experimental error. On the whole, whe the cardiac output fell—e.g., after hæmorrhage—th blood-pressure showed a similar fall. When cardi output rose—e.g., in the head-down position after hi spinal anæsthesia—the blood-pressure also rose. It ma be supposed that a common factor is involved, whi in all probability is the volume of venous return to th right heart.

SUMMARY

The effect of the 18° head-down position on the cardia output and blood-pressure of dogs and cats in states o arterial hypotension was studied.

Arterial hypotension was produced in one series by bleeding and in another by high spinal anæsthesia.

No significant improvement in cardiac output or blood-pressure was noted in hæmorrhagic hypotension.

In the hypotension of high spinal anæsthesia, on the other hand, a significant increase in blood-pressure followed the adoption of the 18° head-down tilt. The coincident improvement in cardiac output was on the borderline of statistical significance.

Variations in cardiac output and in blood-pressure were roughly parallel.

References at foot of next page

H. G. FARQUHAR said that toxoplasma was a on parasite of animals, being found in cats, dogs, rabbits, canaries, sparrows, and many other ls. In man infection manifested itself in four or less distinct ways: (1) a congenital infection, ich the fœtus was affected in utero; (2) an encepha- fecting older children; (3) an acute febrile illness lts, with a rash rather similar to that of typhus, ith a high case-mortality; and (4) an apparently omless infection in adults, which could often only gnosed by specific tests, but which might be con- in the female by the birth of a child affected the disease. The congenital type was manifested ns affecting the central nervous system and the and more rarely there might be anæmia, hepato- megaly, and other disturbances. The diagnosis be confirmed by finding the parasite in the blood, erebrospinal fluid, or, post mortem, in the tissues. for antibodies also helped in the diagnosis.

Reviews of Books

olytic Disease of the Newborn

M. PICKLES, D.M., Nuffield graduate assistant in nical pathology, Radcliffe Infirmary. Oxford: Black- ell Scientific Publications. 1949. Pp. 181. 15s.

e demonstration of the Rh antigenic system a e ago has led to an elegant sequence of discovery, Dr. Pickles traces in his book, beginning Landsteiner and Wiener's original work, and pro- g to the demonstration by Levine and his co- rs of the association between the Rh factor and oblastosis; thence to Fisher's brilliant analysis antigen complex, to Race and Wiener's independent nstration of the incomplete agglutinin, and finally e return of exsanguination transfusion originally sted by Hart in 1925. The logical outcome of this nce—the removal of maternal agglutinin by the f appropriate haptene during pregnancy—is still ed. In a clearly written section on Rh antigen ntibodies—a difficult subject—he notes that anti-Rh originally agglutinating, may become incomplete orage. It seems from this section that the duties e general clinical pathologist in relation to the actor end with a primary division of individuals positive and negative, and with cross-matching amond's method or with albumin solution: detailed ication of antigen and agglutinin are best left ecialists in this field. Dr. Pickles insists that liver e is a commoner cause of death than anæmia: his leads him to recommend replacement-transfusion elected, but not for all, cases of erythroblastosis. mains to be seen whether universal replacement- fusion would in fact decrease the incidence of late ous sequelæ. The reader is also cautioned against risk of overloading the circulation with excessive fusions—a danger more likely to be overlooked in ts than in adults.

Pickles has first-hand experience of his subject the laboratory and clinical angle, and since the nd covered is so wide his monograph will be of diate interest to immunologist, obstetrician, pædia- n, and not least the general practitioner, who is ften the first to meet hæmolytic disease in the orn.

hemistry in Relation to Medicine

C. W. CARTER, M.A., B.M., fellow of Queen's College, Oxford; R. H. S. THOMPSON, M.A., B.SC., D.M., professor of chemical pathology in the University of London at Guy's Hospital. London: Longmans, Green. 1949. Pp. 442. 25s.

OBLEMS which exercised the best brains last year be set as an exercise for the students tomorrow, nothing illustrates the progress of biochemical teach- in the last thirty years better than a glance through pages of this book. Its aim has been "to present e aspects of biochemistry which are significant in icine," and it has both a theoretical and an experi- tal basis. After a historical introduction and pters devoted to the chemistry of the carbohydrates, fats, and proteins, the authors pass on to discuss enzymes, biological oxidations, pigments, and electrolytes, and the acid-base balance. Nutrition follows, and the later parts of the book are devoted to a consideration of some of the body fluids, such as the urine and bile, and the function of the stomach, liver, kidney, and pancreas. Thus structural chemistry gradually gives place to bedside methods; and, though every expert will no doubt find that his own section is not as good as it might have been, few will be able to improve on the others or on the arrangements of the whole. Each chapter ends with practical work, which may be qualitative or quantitative, and the exercises are based on those which have been tried and which have not been found wanting in the medical and honours courses at Oxford.

This book is the joint effort of two experienced men, and it has both balance and judgment. It owes something to predecessors such as Cole's *Practical Physiological Chemistry*, Plimmer's *Organic and Biochemistry*, and Harrison's *Chemical Methods in Clinical Medicine*; but the authors would doubtless be the first to admit this, and they have imparted so much character to their book that it will always stand alone. There are about 600 references, mostly to journals written in English, which will be very helpful to an advanced student; but there is also a great deal of information, clearly set out and simply set out, which will be read with real pleasure by many older students who have long since taken their last examination.

Evolution of the Forebrain

The Fundamental Anatomy of the Telencephalon. G. H. W. SCHEPERS, D.SC., M.D. Johannesburg. Cape Town: Maskew Miller. 1948. Pp. 212. 50s.

IN this large monograph Dr. Schepers has collected his original anatomical studies of the telencephalon of *Testudo geometrica*, and related them to other studies of the forebrain, notably by his predecessors Herrick, Johnstone, Elliot Smith, and especially Kappers. He discusses the morphology, cyto-architecture, and vascular supply of the forebrain of different reptiles and vertebrates, and ends with a short account of their evolution in man. To those who will use this specialised work it will need no introduction.

The Sulphonamides in General Practice

E. D. HOARE, M.A., M.D. Camb., bacteriologist, Redhill County Hospital, Edgware. London: Staples Press. 1949. Pp. 90. 5s.

THE subject is presented on the conventional lines found in textbooks of pharmacology and therapeutics. The matter is well arranged and the style is easy. In a monograph of this kind it is inevitable that difficulty should arise over what to omit. Some may think it unnecessary to include all the fifty-five trade names of sulphanilamide, or to set out in detail the formulæ for ointment bases. No mention is made under Dysentery of the use of sulphonamides to supplement emetine therapy in intestinal amœbiasis.

Lehrbuch der Chirurgie

Editors: A. BRUNNER, C. HENSCHEN, H. HEUSSER, A. TUETZER, O. SCHURCH, J. VEYRASSAT. Vol. I. Basle: Schwabe. 1949. Pp. 912. Sw. fr. 74.

THIS first part of this new system of surgery describes the generalities of surgery, diagnosis, indications, tumours, skin diseases, the affections of arteries and veins, diseases of the bones, joints, and bursæ, neurosurgery, the endocrine glands, war surgery, plastic work, diets, and physical therapy. To those who read German it is a book worth buying, for the numerous authors are evidently among those who, as the preface neatly puts it, regard specialisation as the crown of general surgical practice. The slightly different outlook—the Continental outlook deriving largely from the once famous Viennese school—is interesting. The section concerned with what we call general surgery is extremely well done and is probably the best part of the book. Of the rest it can be said that, while the standard is high, the relative emphasis is often different from ours. Thus gonococcal arthritis is dismissed in four lines, while the advice to curette carbuncles and open them by parallel incision, *Progress.*—Penicillin and postural drainage were continued. By Feb. 10 the patient was deteriorating rapidly and coughing up more than 600 ml. of pus a day. The question of open drainage was now seriously considered. Despite the condition of his heart it was now obvious that the patient would not survive much longer in his present state.

Inhalation of Penicillin.—At this critical juncture the patient was given micropulverised penicillin from an 'Aerohaler' (Abbott), more or less as a last chance, and without, it must be admitted, a great deal of faith in its ultimate power. The patient inhaled 100,000 units from the aerohaler three times a day, and within three days a remarkable transformation occurred. All signs of toxæmia disappeared, the patient's appetite returned overnight and was difficult to satisfy, so voracious did it become; his eyes, which hitherto had seemed to burn in a sallow face, lost their bright ethereal light; his mental outlook altered from one of despair and despondency to exhilaration and hope; and the quantity of pus rapidly diminished till within seven days it had become but a few gobbets of mucopus in the sputum mug after 24 hours. The pleural rub disappeared in a few days. Within a fortnight the patient had regained most of his lost weight and began to talk of getting up.

Radiography on March 2 showed remarkable improvement. The cavity at the right base was much smaller, and only a trace of fluid was seen. There was fairly well-marked pleural thickening. Nothing definite was found on the left side.

Progress.—By March 20 the patient was sitting out of bed, and within a week he was walking about, completely afebrile; the cavity had almost closed; cough was absent; fibrillation was controlled with digoxin 0·25 mg. daily; and, except for a mild scoliosis due to falling in of the chest wall, the patient seemed as well as he had ever been.

The micropulverised penicillin had been given altogether for eight days; the patient receiving a total dosage of 2,400,000 units by this route. There were no ill effects.

DISCUSSION

The clinical improvement was even more spectacular than the radiograms suggested. There can be no doubt that the micropulverised penicillin was responsible for his rapid recovery. In fact, while the patient was using the aerohaler, postural drainage, which was at best poorly tolerated, was suspended. It was unfortunate that the organisms in the sputum were not identified, and perhaps it was improper to give penicillin without first ascertaining whether the organisms were sensitive, though the end-result proved conclusively that they were.

From this favourable result, and from the case reported by Krasno et al. (1948), it appears that we have at last an effective means of bringing penicillin and other antibiotics to abscess cavities cut off from blood-supply. It would be interesting to see if a similar improvement could be produced in the toxæmia resulting from secondarily infected tuberculous cavities; mixtures of various antibiotics could be used according to the organism present.

SUMMARY

A lung abscess complicating lobar pneumonia, in a patient with auricular fibrillation, was treated with micropulverised penicillin delivered through an aerohaler.

This method of treatment proved remarkably effective and saved the patient from a surgical operation.

The administration of antibiotics in the form of a fine powder, by means of a suitable inhaler, might be equally successful in other conditions with lung cavitation; in which systemic administration does not bring the antibiotic into contact with the organisms in a therapeutic concentration.

My thanks are due to Dr. W. McHugh, radiologist, Central Hospital, Galway, for his coöperation.

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Medical Societies

LIVERPOOL MEDICAL INSTITUTION

NEONATAL PNEUMONIA

AT a pathological meeting on Oct. 20, with P CHARLES WELLS, the president, in the chair, Dr. A. CRUICKSHANK spoke on Studies of Neonatal Pneumo

Dr. Cruickshank illustrated some of the com conditions found in the lungs of babies who had died birth or within a few days of birth. These inclu atelectasis with well-marked interstitial emphyse polymorphonuclear cells in the alveoli of a stillb infant; inhaled squamous debris from the infant's skin; macrophages filled with phagocytosed meconiu and alveoli lined by hyaline membrane. Meconium been shown to have a harmful effect, by virtue of intensely irritant bile-salts which it contains. So workers had suggested that the unborn infant norm inhaled amniotic fluid. As regards amniotic fluid in anim the desquamated squamous cells contained in it capable of causing a foreign-body giant-cell reactio the lungs, and collapse and leucocytic emigration follo the experimental injection of cell-free, sterile amni fluid. (A similar reaction followed the injection of no saline.) Thus it must be abnormal for amniotic to reach the infant's alveoli; and this happened as a result of difficult labour or some other cause, fœtal asphyxia. If the reaction in the lungs of rabbits were an index of the reaction in man, it likely that the lungs of an infant who had inhaled m amniotic fluid would become so atelectatic that it wo not survive for more than 3 days after birth. Exp mentally a foreign-body reaction had been found 4–5 days, but such a reaction was very rare in mat from infants who died in the neonatal period. Th foreign-body reaction could arise in a baby was sh by the case of an infant who had survived for 4 d with amniotic debris in the lungs; the rarity of a finding was evidence of the uncommonness of surv for as long as 4 days.

During the discussion, Dr. J. D. HAY referred to amniotic fluid which lay in the trachea and bronchi the fœtus in utero, and the view held by some th inspiration after birth resulted in this being such into the bronchioles and alveoli.

TOXOPLASMOSIS

Dr. A. MACDONALD described various methods the laboratory diagnosis of toxoplasmosis including serum-neutralisation test on the chorio-allantois of developing chick and a complement-fixation test usi antigen prepared from infected chick-embryo tissue.[1] Liverpool three cases of congenital toxoplasmosis ha given similar results with both types of test; and 3 out of 100 "normal" sera positive compleme fixation tests were obtained—presumably as the re of symptomless infection. It was more difficult to a the significance of a positive test in patients who only one or two of the clinical signs associated with disease. Preliminary investigations had shown that incidence of positive complement-fixation tests greater in infants with anencephaly, chorioretinitis, mental retardation than in normal children. Blood fro both mother and infant should be examined, preferabl by at least two types of serological test.

In the course of the discussion, Prof. N. B. CAPO referred to Sabin's most recent paper[2] which emphasise the difficulties of serological and immunological diagnos of toxoplasmosis. Dr. J. BERKSON said that illustration of the retinal changes attributed to toxoplasmosis di not appear to him to differ from those previously labelled congenital coloboma, or old congenital choroidoretinitis One of the three cases discussed by Dr. Macdonald wa a patient of Dr. Berkson's. This is a boy, aged 9, wit convergent strabismus in a microphthalmic eye, and large area of old choroidoretinitis. He appeared to be mentally defective. The case was shown to Dr. Berkson's colleagues as one of toxoplasmosis, and radiography of the skull showed areas of cerebral calcification.

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1. Macdonald, A. *Lancet*, 1949, i, 950.
2. Sabin, A. B., Feldman, H. A. *J. Pediat.* 1949, 35, 296.

Vasodilatation

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to curette tuberculous glands, and to immobilise cases of thrombophlebitis differs from the usual teaching in this country. But this is exactly why it is useful to read the book. In view of recent discussions it is interesting to find that removal of the whole saphenous vein is nearly always successful in curing varicose veins. Swiss surgeons do not seem to be acquainted with the excellent results, in the hands of Wilfred Harris, of gasserian-ganglion injections, and repair of the facial nerve in the mastoid process is not mentioned.

Die Schmerzverhütung bei chirurgischen Eingriffen

Dozent Dr. PAUL MORITSCH, Vienna: Maudrich. 1949. Pp. 279. Sch. 28.

THE publication of this well-made and well-illustrated book will be welcomed as evidence of recovery of the famous Vienna medical centre from the depredations of war and the tribulations that have followed. It may be a matter of surprise that it is a book on anæsthesia, for most Continental centres have lagged far behind those of Great Britain and America in this subject; but this also may be regarded as a good sign—an awakening to the importance of anæsthesia, the boundaries of which, the author (a surgeon) says, are now so extensive that it has a right to be considered as a separate science. He adds that in America it has been so for a long time!

Less than a third of the 260 pages deal with general anæsthesia, and some of the equipment for inhalation as illustrated is so far out of date that it would be hardly recognised by the present-day medical student here; it is perhaps significant that chloroform is given more space than any of the other inhalation anæsthetics. The main part of the book is concerned with local and regional anæsthesia in all its forms. This is illustrated by numerous accurate diagrams, and should be a useful source of information for surgeons and anæsthetists in this country whose experience of these forms of anæsthesia is limited. The text is lavishly supplied with references, most of which are from German or Austrian sources.

Mongolism (Peristatic Amentia)

M. ENGLER, M.D. Vienna, D.P.M., assistant medical officer, St. Lawrence's Hospital, Caterham. Bristol: John Wright & Sons. 1949. Pp. 208. 21s.

FEW will agree with Dr. Engler that at birth 40–50% of all mental deficiency can be classed as mongolism; nor is it necessary, in the absence of any supporting evidence, to be alarmed by his belief that the condition is on the increase. Nevertheless even on his assumption that mongolism is found in 0·01% of the population—a more modest estimate than that of Bleyer who gives 28,000 for the total affected in the U.S.A.—the condition is common enough to justify the appearance of a new book on the subject.

Much detailed work has been carried out on mongolian imbeciles since the appearance of Brousseau's book in 1928, and this is well summarised by Engler who in addition quotes extensively from his original material. It is natural to compare his book with that by Benda,[1] recently published in America. While both authors have done immense service to all workers in mental deficiency by compressing into a small compass the large and diffuse literature on mongolism, the objectivity of both is impaired by their attachment to a particular hypothesis. Benda blames the pituitary for the symptom-complex of mongolism, while Engler supports the theory of damage to the fertilised ovum from implantation in a diseased uterine mucosa. Although his book is well illustrated and produced, the terminology is loose and the text lacks scientific precision, and is at times contradictory. His choice of skin colour to illustrate the application of Mendel's law to human inheritance is unfortunate, since human skin colour does not lend itself to classification as a "recessive" or "dominant" character; and his statement that the delay in mental development in sufferers from mongolism has "hardly any connection" with the "anatomico-histological changes in the brain" is confusing for those who believe that the brain is the main organ responsible for mental development. By his own admission verbal tests are not very satisfactory for mongols, and it would valuable, in a subsequent edition of the book, to gi results of performance tests. But he has performe a notable service in making readily accessible the da needed by those attacking the baffling problem mongolism.

Techniques de détermination des groupes sang appliquées à la transfusion (Paris: Masson. Pp. 140. Fr. 500.).—Dr. Jean Moullec directs the labora of the Centre National de Transfusion Sanguine. The tec niques he describes do not differ from those used in th country; and, in fact, he gives full credit to British a American workers, especially on Rh groups. His book well produced and illustrated, but most potential read in this country have adequate publications in English, a there are no novel features about this French one.

Symptoms in Diagnosis (2nd ed. London: Baillie Tindall, and Cox. 1949. Pp. 542. 42s.).—Prof. Jonathan Meaki has not altered the purpose or arrangement of his useful boo on diagnosis, though he has slightly enlarged its scope. gives a clear and thoughtful exposition of the character a meaning of symptoms in clinical medicine, and a clear int duction to the proper study of disease. The new editi has new chapters by five of the author's colleagues at McG University, including one on symptoms in psychiatry wh all students starting work in the wards might read wi advantage—and enjoyment. The book is well suited to t student working for examinations, and has far fewer vag generalisations and hardened clichés than most.

The Story of the Johns Hopkins (Kingswood, Surre Windmill Press. 1949. Pp. 265. 12s. 6d.).—The idea of th hospital and medical school had its birth in the brain of t curious and crabbed man of genius, Johns Hopkins; an shrewd and business-like, he pursued it until it became a livi reality. By strange coincidence, the men were at hand found and foster his great scheme; for Welch, Osler, Halste and Kelly arrived on the scene to rear the infant scho of medicine, and then gradually brought it to a sta which it has never lost. The story of Johns Hopkins Hosp as related with dry humour by Dr. Bertram M. Bern is well worth reading, if only because of the intimate deta and sidelights he gives us of the early life of Osler. Osle three colleagues were, each in his own way, equally ou standing personalities, and the team-work of the four w remarkable.

Recent Advances in Physiology (7th ed. Londo J. & A. Churchill. 1949. *Pp.* 268. 21*s.*).—The physiologist i search of up-to-date information, Prof. W. H. Newton sa in his preface, is in an exceptionally favourable position ju now, thanks to the many periodicals, annual reviews, a symposiums published. It would be easy, presumably, offer a hurried and uncritical survey of this vast territory but this would hardly gain the thanks of readers of yea books. They expect some selection and evaluation of th facts, and this is what *Professor Newton* sets out to giv them, indicating to the student "certain main currents thought, anchoring him meanwhile near one of the ma sources." His chosen subjects include temperature regu tion, water diuresis, catheterisation of the heart, bloo pressure and the kidneys (written with Dr. I. Calma), colo vision, and the electrical excitation of nerve. All the chapte are new.

Notes to Lewis's Diet Charts (London: H. K. Lewi 1949. 7*s.*).—These diet charts, now revised by *Prof.* V. H. Mottram, are intended for the use of the general practitioner. There are eighteen main charts covering various conditions such as gout, tuberculosis, allergy, and kidney disease. The explanatory notes form a concise and useful summary of the use of the various diets given—though the statement that acne vulgaris "is sometimes but not invariably a symptom of scurvy" seems rather misleading. The charts themselves are easy to read and understand, and the general rules given at the bottom of each are most helpful. It must be admitted that some of the diets suggested will be difficult to follow in our present era of food restriction and rationing: for example it is stated that for allergy one should "take a diet for not more than one week consisting of meat (chicken, lamb and mutton), rice, butter, and sugar." In general, however, the charts serve their purpose, and they may well be recommended to the busy practitioner who has not the time to discuss dietary schemes with his patients.

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[1] See *Lancet*, July 16, p. 112.

THE LANCET

LONDON: SATURDAY, NOV. 19, 1949

Registrars

E Registrars' Association was formed with the diate aim of removing anomalies and easing hip in the new health service; and on Saturday, 26, the association, which now hopes to form up within the British Medical Association,[1] is ld an open meeting in London. One of the main will no doubt be emoluments. In general, rars are satisfied with their remuneration. but emoluments there is serious discontent. The ent goes something like this:

> The charges made by neighbouring hospitals to nt registrars differ by as much as £30 a year. is no adequate reason for this wide divergence; arge should be kept within a uniform and reasonimit as it is for housemen, who pay £100 a year.
>
> Non-resident registrars when they remain on duty ht should *not* have to pay for lodging, and possibly ot for board.
>
> The hardship for non-resident clinical registrars emain on duty outside normal times is underlined e comparative fortune of others—for example, in iagnostic departments—who have a good chance eping office hours and always sleeping at home. ings stand, the longer the non-resident registrar or is on duty, the more he is penalised financially.

rgument deserves attention. At whatever level harge is fixed, there seems no good reason why uld not be uniform. As regards the inequity harges to non-residents, some hospital authorities sidestepped by advertising all their registrar as resident; and this development the associaor the new group, will doubtless contest, particubecause at the moment an unusually high rtion of registrars are married and have to keep ne going. It is very difficult to escape the usion that registrars should normally be nonnt, and that the cost of lodging and of meals uty beyond normal hours should be defrayed e hospital. Even the London County Council, was not notably sympathetic to its married al officers, eventually conceded that those in s upwards from A.M.O.2 (in which the graduate, g been qualified at least 1 year, held a 2-year ntment) might live outside the hospital, with esponding allowance.

econd topic that may be raised at next week's ng is representation. Registrars have complained fficulty in making their voices heard; but ess has been made with their securing a place e B.M.A.'s Central Consultants and Specialists mittee, and with agreement to the principle they should be represented on the regional mittees.[1] Furthermore, the new group, backed e authority of the British Medical Association, now be strongly placed for central negotiation. e remains, however, the question of representation e medical advisory committees of local managecommittees. It may be reasoned that registrars are neither experienced enough nor permanent enough in tenure to earn places on these bodies. To this the registrars retort that they, who work in the hospital throughout the day and sometimes also the night, know more of its workings than consultants, who are often in the building for no more than a few hours during the day and not at all at night, and who may never stir from their own department. Enthusiasm and initiative, it is rightly said, can best be assured by the offer of a responsible place in the management of the hospital's medical affairs.

By far the weightiest matters, however, which will have to be considered next week are the conditions under which registrars now work and their future prospects. Unhappily there are signs of growing cleavage between the registrars in teaching and in non-teaching hospitals. In more than one region the impression is gaining ground that the chance of securing a consultant appointment is unreasonably small for candidates from the non-teaching hospitals; and in some regions this impression has already reduced the number of applications for junior posts in such hospitals. The best hope of a remedy seems to lie in adjustment of the method of appointing registrars. At present appointments are made by management committees; and this practice could possibly be allowed to continue in respect of junior registrars, who do not always proceed with specialist training. As regards the two higher grades, however, much might be gained by transferring the duty of appointment to the regional board. The first advantage would be that those who appoint the consultants would have a chance to examine the merits of those who hope eventually to apply for consultant posts; and in this way the standard sought by the boards might be more satisfactorily achieved. Secondly, the way would be cleared for a healthy interchange of duties between registrars in teaching and in non-teaching hospitals, with a corresponding variation in emphasis between the academic and the practical. The one serious disadvantage is that members of the hospital staff might have less chance to influence the choice of a registrar by their judgment of his compatibility. By whatever method they are selected, registrars and senior registrars should not greatly exceed the number that can eventually gain a consultant post. Some excess is of course reasonable. since no-one can predict with certainty that a postgraduate engaged in learning will qualify to practise his specialty; but a fair measure of competition has always been the registrar's lot, and this he is still willing to accept.

Even if, as we believe, this adjustment in the method of selection would aid those in training, it would still do nothing for the many who are waiting doggedly, if with fading hope, for a place among the consultants. Should they continue to wait, or seek an appointment in the Services or overseas, or turn to general practice? They expected to know the answer when the consultant establishments were finally determined; but unfortunately it must be some months yet before this work is completed. and even then lack of money may prevent the boards from filling all the new posts. Meanwhile, it might be helpful if hospital boards could announce, collectively or individually, the number and nature of the appointments which they expect to advertise within, say, the next eighteen

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[1] *Brit. med. J.* Oct. 29, suppl. p. 196.

A&H

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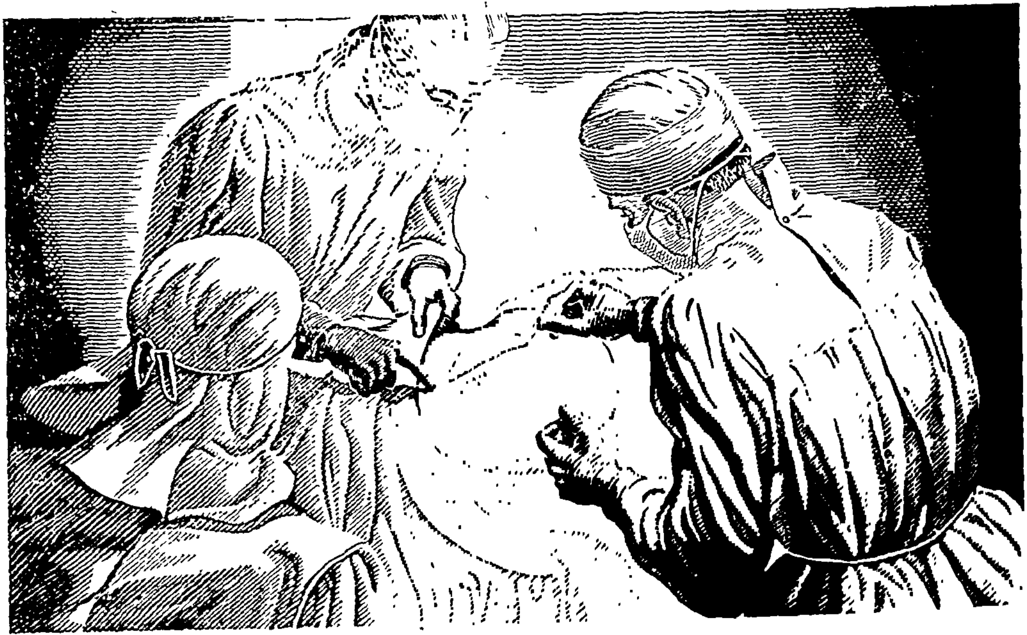

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ng children with life-long protection against ıtheria, tetanus, and other risks of normal life vell as protection against possible future attacks acterial warfare.

embership of Management Committees

HE Minister of Health's circular on filling vacancies ıospital management committees[1] throws several of light on the official theory of hospital adminis- ion. After the decision to nationalise the hospitals taken in 1945, a framework for the new service put together with great skill and an almost nch logic. It culminated in the Minister at the x, and the Minister was synonymous with the lic interest: the regional boards were the Minister's nts, and the hospital management committees e thus a local interpretation of the public interest. this simplification obscured the need to define proper function of the hospital management com- tees and to decide what kind of people should be ointed to them. Little thought was given to the stion of whom (if anyone) they should "represent," what part on them should be played by doctors.

et us look first at the medical membership. Amid upheaval created by the Act the proposition that dical men should be appointed in some numbers the hospital management committees received a eral blessing from the medical world, though ually it is quite contrary to the best practice of the mer voluntary hospital. The new circular is a n that the Minister appreciates the mistake that s then made. It points out that the annual recur- ice of vacancies affords an opportunity for reviewing present composition of committees, and continues:

> "(a) The Act requires consultation of senior medical nd dental staff—through staff committees of hospitals r groups or other convenient channels—and it is learly intended that one element in the membership f Committees shall be this professional one. The roportion of professional members should not, however, e high. It is very undesirable that in the com- osition of Committees any professional element should form a substantial proportion of the members. The Committee must essentially be and remain a group of non-professional members of the local community, rendering voluntary service in the public-spirited tradition of the past and in the interests of the community; and any implication that the Committee was a body more likely to be concerned with the interests of the staff than those of the community would be most unfortunate.
>
> "(b) Medical and dental members should normally be derived as implied by the Act, from names proposed by the hospital staffs and not from other sources."

ese wise provisions go far to re-establish the proper tus of the medical committee of the hospital. e very first principle of good hospital administration a proper understanding of the relation between the committee on one side and the medical committee the other. At the heart of the hospital lies a ntract: the lay committee agrees to entrust the re of the patients to the medical staff and to refrain om interference in medical matters, while the medical aff, for their part, agree to accept a collective sponsibility for the discharge of their duty, and to efrain from influencing the lay committee in favour this or that save through their own medical committee and its appointed representatives. If hence- orth the regional boards will normally appoint medical (and dental) representatives on the hospital management committees *only* on the recommendation of the medical and dental staff, this principle will be secured. The Ministry is to be congratulated on pushing into place a cornerstone of the edifice which was left dangerously loose three years ago; and though one effect of its recommendations may be a decrease in the number of medical members of management committees. the ultimate and more important effect will, we believe, be an increase in the influence exerted by medical opinion.

How should the lay member be chosen? The position here is much less satisfactory. The Act required consultation with various representative interests when the new bodies were first established; and the Minister's circular now says that such consultation, though not statutory when filling vacancies, is nevertheless desirable. So far there will be general agreement. But the circular may be going much further when it says:

> ". . . it is important that the community served by each Committee should be as closely as possible identified with the Committee and the hospitals it controls, and the Board should therefore consider whether there are any additional organisations representing the consumer interest which they could usefully consult. . . ."

The appearance of the phrase "consumer interest" marks a new departure, and if it passes unchallenged a time may soon come when it will be assumed that any consumer interest has a right to be consulted, and by inference to be represented. Like the Ministry, we are anxious that public opinion should play its part in the management of hospitals: by such means as the meetings described in an annotation this week people should be brought to feel that these are their own hospitals, which they can criticise, support, and help to improve—not institutions outside their control, provided by a paternal State. On the other hand, members of the lay board of a hospital ought to be chosen primarily for their personal qualities; and the representation of "consumer interest" imports into the hospital world a theory of government which has evident limitations in medicine or the social services. (Must we, for example, expect to see "aged chronics" claim an increasing share in the management?) Though the lay committee should represent the public, and should not be a collection of experts, the men and women appointed should be, in GOLDWATER's words, both "familiar with the principles and methods of business administration" and "inspired by sound ideals of social service." This is quite compatible with the wide consultation required by the Act; it may be less compatible with the pursuit of consumer representation for its own sake.

On a third important point, closely related to the last, the circular is silent. How much weight ought the regional boards to give to the views of the hospital management committee when appointing its new members? The hospital management committee is, it is true, first on the list of those who have to be consulted; but a strong case could be made for the view that this is not in itself enough. If a hospital management committee is to consolidate a sense of corporate responsibility it must possess some real power to control its own membership. There is here, of course, a dilemma: on the one hand the chain of months, together with the figures for registrars now at work. The ratio of trainee specialists to consultants should, as we have indicated,[2] not much exceed 1 to 4; and such a survey would certainly reveal that, even allowing for new appointments, this balance has become seriously disturbed. The boards' figures would necessarily be provisional, since they are still uncertain whether the money they need will be forthcoming; but this should not greatly deter them. Registrars have worked too long in the dark; their urgent need is for illumination, however imperfect; and the boards ought to provide this without further delay.

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[1] R.H.B. (49) 143 See *Lancet*, Nov. 12, p 922.

Sites of Antibody Production

For as long as the existence of antibodies has been known immunologists have sought to discover their nature, mode of formation, and site of production. The earlier experiments suggested that they were formed in the reticulo-endothelial system, and during the past twenty years various workers have shown that the lymph-glands draining injection areas play an important part in their production. There is also evidence—discussed in these columns last week (p. 899)—that lymphocytes synthesise γ-globulin, which is an important source of antibodies; though Ehrich and others[3] take the view that plasma cells rather than lymphocytes are the main antibody-producers. Up to now investigations have been almost entirely limited to such particulate antigens as bacterial suspensions, heterologous red cells, and viruses. The antibodies produced by these antigens cannot be measured with the same quantitative precision as can most antitoxins. The only earlier work using soluble antigens appears to be that of Osterlind[4] and of Burnet.[5] Burnet found that in immune rabbits given a secondary stimulus of staphylococcus toxoid there was considerable enlargement of the lymph-node on the inoculated side but there was only a barely significant difference in the antitoxic titres before and after the toxoid. Osterlind showed that the injection of diphtheria toxoid into the leg of a normal rabbit caused enlargement of the regional lymph-gland, while the germinal centres increased in size but not in number. After a similar injection into an immune rabbit the germinal centres increased in number at the time of the maximal secondary response.

The work of Oakley and his colleagues,[6] just published, has mainly been done with diphtheria and tetanus alum-precipitated toxoids; the corresponding antitoxins can be measured with an accuracy well within 10%. They show conclusively that after secondary stimulation of horses, rabbits, and guinea-pigs antitoxin is produced in the lymph-glands draining the injected area. As an example of the type of evidence they have produced, a horse was given a secondary stimulus of diphtheria A.P.T. in one hind leg and tetanus A.P.T. in the other; seven days later the tetanus/diphtheria antitoxic ratio was 10·5 times as great in an extract of the popliteal lymph-gland in the leg injected with tetanus A.P.T. as in the serum, whereas in a similar extract taken from other leg the diphtheria/tetanus ratio was 28 t that in the serum. They further showed that in certain circumstances antitoxin was produced in the skin at the site of injection. Nine months after the last stimulus in one horse concentrations of antitoxin were found that suggested continued production in the local lymph-glands but not in the injection areas. We still do not know what proportion of the total antitoxin is produced at the site of injection or in the local lymph-glands. Secondary responses with a considerable local production of antibody are not limited to injections made at or near the site of the primary stimulus. It follows that cells modified by antigen are carried to all parts of the body; they may all pass through the glands draining the injection area and only a fraction may remain. From a large initial dose of antigen far more reacting cells may reach all parts of the body and continue to multiply in their new specifically altered state. Because of this multiplication, the larger the initial dose of antigen and the longer the interval before the second injection the greater will be the secondary response. The size of a secondary stimulus has far less influence on the amount of antibody formed—very small injections may result in the rapid production of many thousand times the amount of antibody which would be equivalent to the antigen injected. The specificity of a secondary response shows that it is due not merely to a great increase in cells to deal with foreign protein but to a selective stimulation causing cells already specifically altered to multiply rapidly. It is not yet certain whether some types of primary stimulus may be followed by a good production of antibody but little basal immunity, whereas other types of primary immunisation may appear less satisfactory until a further stimulus is given. This might depend on the number of molecules of antigen taken up by each lymphocyte or other cell or on the rate at which the antigen is taken up, the rate of increase in number of the cells, or the capacity of the local lymph-glands to deal with this increase.

Many of the known facts about soluble antigens may eventually be explained by further work on the sites and methods of antibody production. The different capacities of individuals to produce antibodies, when the poor response is specific to certain antigens only, may be a result of initial stimulation by partially denatured or distorted antigens; an incapacity to respond well to all types of antigen probably results from some general defect in the reticulo-endothelial system. Rapid loss of antibody may be due to the initial slightly misshapen antigen becoming further distorted in descendants of the initial reacting cells. The latent period before antitoxin can be detected in the circulation is probably explained by the time required for sufficient generations of cells to be produced. It is well established that any attempt to hyperimmunise an animal too soon after primary stimulation results in the production of antibody poor both in quantity and quality. This is hard to explain, and the observation may prove of great value in the final elucidation of the causes and methods of antibody production. The study of the sites of antibody production may add to our knowledge of physiological processes and may also lead to methods of permanent immunisation providing

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2. Leading article, *Lancet*, 1949, i, 827.
3. Ehrich, W. E., Drabkin, D. L., Forman, C. *J. exp. Med.* 1949, 90, 157.
4. Osterlind, G. *Acta path. microbiol. scand.* 1938, suppl. 30.
5. Burnet, F. M. Production of Antibodies. Monograph No. 1 of the Walter and Eliza Hall Institute, Melbourne. 1941.
6. Oakley, C. L., Warrack, G. H., Batty, I. *J. Path. Bact.* 1949, 61, 179.

Annotations

REMUNERATION OF PRACTITIONERS

HE Minister of Health has informed the British ical Association that in his opinion “ no reasonable can be made for any increase in the total remunera- of general practitioners. nor any argument sub- tiated to show that general practitioners as a group inadequately paid. Nor, in his view. could any claim stified that any future alteration of remuneration ny later date should be made retrospective, either uly, 1948. or to the present day.”

INSULIN IN BUERGER'S DISEASE

Extreme remedies are very appropriate for extreme ases”—and there are few more desperate states than anced Buerger's disease. Curbed by intermittent dication, kept awake by severe foot pain. these ents suffer the crowning horror of ischæmic necrosis ch robs them of digit or foot or necessitates an above- e amputation. often with an ill-nourished. ulcerated mp. Fortunately the disease sometimes abates before ching this advanced stage ; and. attacking as it does n under the age of 50, there is some prospect of thwhile collateral flow and recanalisation if only the nding arteritis stops. Rational therapy is impossible e the cause of the disease is unknown ; and trial and r have accumulated a variety of therapeutic measures, h as sympathectomy, intermittent venous occlusion, therapy, intravenous hypertonic saline—to men- n only a few—none of which has established a very re place for itself. The most that can be said of of them is that remission of the active angiitis d improved peripheral blood-flow sometimes follow ir use.

n this issue Dr. Mazanek revives in modified form ethod of treatment first used nearly a quarter of entury ago by French workers who believed that rovement could be induced by the daily injection of 20 units of insulin. Dr. Mazanek gives much larger es (50–100 units twice daily for twenty days), his aim ng to produce for several hours each day a hypo- cæmia severe enough to cause symptoms but not the paired consciousness and convulsions which are the ective of the insulin treatment of schizophrenia. He ims striking improvement in 20 consecutive advanced es, with healing of trophic lesions, relief of rest pain, inished claudication, and warmer extremities. His ailed account of 5 cases is impressive ; the results are ter than could be expected from any other treatment d cannot be ascribed to the natural course of the ase. The follow-up period is only a few months, so is still doubtful how long the remissions will last. Mazanek shows commendable caution in pointing the beneficial effect of the concomitant rest in bed. he wisely avoids speculation on the modus operandi.

HOME MANAGEMENT OF PHTHISIS

DOMICILIARY treatment of the tuberculous, which has y been discussed in our correspondence columns, is sidered in more detail by Dr. Trenchard and Dr. tersall in articles which we publish this week. In ny large towns such treatment is now being under- ken, and recently Dr. Beatrice Butterworth and Dr. th Dingley[1] wrote on the complementary aspect of ome care as it affects the patient's family, giving weight the share the family doctor takes in the management the case.

The point which must be clearly brought home to the atient from the start is that he is being *treated*, and is ot merely “waiting for a hospital bed.” This means that e must realise that bed rest is in fact a form of treat- ent which would be begun in any case as soon as he went into a sanatorium. Once he has been convinced that he is “ working off a bit of his bed rest ” he usually becomes much more coöperative, and here the persuasion of his own doctor may be more effective than that of strangers. The range of active treatment which can be undertaken while the patient is living at home is remarkably wide. He may go into hospital for a few days for induction of artificial pneumothorax or pneumoperitoneum. or for phrenic crush or bronchoscopy ; but the first two can be done in the home in suitable cases. Even fluoroscopy can be done at home, with a portable apparatus. One task of the family doctor is to prepare the patient emotionally and by sedation for these events which appear so alarming to him, so trivial to the clinic staff. The family doctor is also the first on the scene in case of a hæmoptysis, and must resist the family's urgent demand that he should get the patient into hospital—explaining that it is better for him to stay where he is and rest, so that the bleeding has a chance to stop. If necessary the chest physician can come to him.

It would be foolish to suppose that domiciliary care is an advance on sanatorium care for the early case of tuberculosis : for however satisfactory it can be made for the patient it still carries some risk for the family. especially if there are young children or adolescents living at home. All agree on the necessity of a separate room for the patient, and where home conditions do not allow this the local authority will always help to provide better quarters. But, as Dr. Dingley notes, a separate room is not much use unless the patient stays in it ; and some young and discouraged people are difficult to keep there. The danger to other people. and especially the danger to children under five, is much reduced if the patient can be given even a brief period of sanatorium care before being treated at home. On general principles. however, children under five should not be exposed to infection from an open case in the home if this can possibly be avoided. If it cannot, there is a chance to use some ingenuity. A gate-door to the patient's room, Dr. Butterworth finds, keeps out small children and makes others think twice before coming in. Children of school age are less susceptible to pulmonary tuberculosis than younger children ; but they, and their much more vulnerable seniors in the late 'teens, may be unruly and hard to keep out. Dr. Butterworth advises that the patient's door should be locked while they are at home—but only if the patient is willing and has a duplicate key.

ANY COMPLAINTS ?

AT the start of the National Health Service, hospital management committees were too busy setting the new machine in motion to worry much about what its users thought of it. That phase. however, is over ; and committees are having to consider how they will face the public. There is little risk that the attitude of benign despotism which often prevailed under the old voluntary-hospital system will survive ; but there is perhaps some danger that the front which hospital bodies present to the public may be—or, what is equally grave, may seem to be—that of the bland bureaucracy which became familiar in the system operated by some local authorities. An impression of either despotism or bureaucracy must impair the chances of coöperation between hospital and patient and deter those who might otherwise actively help their local institutions : and, no doubt with this in mind, some management committees have been trying to meet the people they serve.

Last week the Lewisham management committee convened a meeting which was attended by representatives of the local community. “ I want you to feel,” said the chairman, “ that you are the shareholders of these hospitals. We shall not shirk any questions. We, as directors, will account to you as shareholders as best responsibility through the regional boards to the Minister is fundamental to the whole conception, while on the other hand it is necessary to provide for local independence. As things stand, the degree of consultation is left to the discretion of the regional board, but much turns on the exact procedure adopted. The letter of the law is satisfied if the hospital management committee is asked for names, simultaneously with the medical staff and the other parties mentioned: and the committee has, one supposes, no grievance if its advice is ignored. Surely it would be better if its rights were made clearer—e.g., if the regional hospital boards were required not only to obtain names from the hospital management committees but also to consult them at the final stage, and to allow them an opportunity to object to any members proposed to be appointed—other than the nominees of the medical staff, who should be appointed as of right. Is there any real reason why the hospital management committee should not be allowed this privilege? It would go far to reduce the possibility of persons getting themselves nominated—and for some theoretical reason appointed—who were sufficiently unsuitable to destroy the sense of cohesion essential if a hospital management committee is to work to full advantage. This is a matter to which the Ministry ought to give further attention, for any assurance that can be given here it will certainly pay a rich dividend in contentment in the hospital management committees.

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[1] *J. med. Wom. Fed.* October, 1949, pp. 12 and 16.

Salmonella Infection

LAST year almost a thousand outbreaks of food-poisoning were reported in this country—twice as many as in 1945 and eight times the yearly average from 1935 to 1938. We can only guess at the total number of people involved, but it seems likely that *Staphylococcus aureus* had as many victims as all the 160-odd salmonella types together. Staphylococcal food-poisoning, however, is a brief if unpleasant encounter, and the self-limiting outbreak is more often caused by ignorance of the ways and means of infection than by gross lapses in cleanliness. With salmonella food-poisoning, or more correctly infection, the case is different, and man-to-man spread can only occur if there is neglect of personal hygiene. Salmonella organisms have been recovered from various unusual places but they are primarily intestinal parasites. The chief pools of infection are pigs and fowls, but rodents and ruminants also carry the organisms and carnivores and cockroaches are not immune. Man is not considered an important reservoir for the salmonellas—except those of the enteric group, which have failed to find permanent quarters in any other host. Many large outbreaks in this country have been traced to infected meat or eggs, but there are also very numerous sporadic cases in man which are difficult to fit into any convenient pattern of spread of the disease. Information is badly needed about the sources from which these apparently isolated cases become infected and what part they themselves play as reservoirs of infection in the community.

Apart from the acute cases of gastro-enteritis it is important to know how salmonella organisms are distributed among normal people. SELIGMANN et al.[1] isolated 26 different types from a large number healthy people in America, and this agrees with se other investigations which have shown that a 3% of apparently normal people may harbour th organisms. Most of the positives, however, we contacts of cases though they had no clinical sig of infection. Adult convalescents may continue t excrete salmonella for 4–16 weeks, but the short period is usual. MACKERRAS and MACKERRAS[2] foun that 35% of children under two years of age who we infected with *S. bovis morbificans* continued to excre the organism two months after infection, and t slower rate of clearance in infants (particularly *S. typhi-murium*) is known to pathologists in th country. Prolonged carriage is especially importa when children are crowded together in hospital, a there is still no good evidence that any of the ne antibiotics shortens the period of danger. It unusual to meet a permanent salmonella carri for the organisms remain in the bowel and are often transported in the blood to sites wh multiplication goes on unimpeded.

In this issue Dr. MACKERRAS and Miss PASK, Brisbane, contrast the low pathogenicity of what th term the endemic salmonella infections with the sev epidemic which they had previously encountered children. From 647 infants attending welfare clinics living in institutions they isolated 21 strains of salm nella, including 7 of *S. typhi-murium*. If these childr are accepted as a random sample of the child popu tion in Brisbane, there should have been 600 salmone infections in the city, whereas only 33 were trea in hospital. It seems unlikely, however, that th sample is random, and this type of argument fraught with difficulties. MACKERRAS and PA suggest that the pathogenicity of a strain is rai when virulent mutants are selected by passage fro one individual to another. With some other infectio there is much evidence for this hypothesis, but we st do not know what part an increase in the pathogenici of an organism plays in epidemic spread. They al believe that the dose of infecting organisms is le important than an increase of pathogenicity; b here again we are dealing with opinions. We do kno that foods (e.g., dried egg) originally contaminat with a few salmonellas may be eaten with impunit whereas if the same foods are kept under conditio where bacteria can multiply they can then cause explosive outbreak of disease. It is certainly true th infection with the salmonella organisms may be wi spread in the community without being suspecte and as in many other diseases the sporadic clini case may be something of an accident in a lo sequence of infection. As FRANCIS[3] reminds us, t frank case of infectious disease simply represents t crop line of a greater bed of infection in the famil cluster or group. People with symptomless infection missed cases, and carriers may excrete just many pathogens as the frank case, and becaus they escape their doctor's attention they are mo likely to hand on the disease. In seeking methods control we have to remember not only this underground spread but also the permanent animal po of infection from which so many outbreaks take thei source.

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[1] Seligmann, E., Saphra, I., Wassermann, M. *J. Immunol.* 1946, 54, 69.

[2] Mackerras, I. M., Mackerras, M. J. *J. Hyg., Camb.* 1949, 47, 1

[3] Francis, T. *J. Amer. med. Ass.* 1949, 141, 308.

unaccustomed overuse of the pretibial muscles cause rupture and hæmorrhage in some fibres and se of tension in the anterior tibial compartment h, added to the usual swelling after exertion, pro- s increasing obstruction of the circulation to the cles and eventual ischæmia. This rise in tension is essential feature in producing the "muscle seques- ," so any factor which leads to such a rise may have same results: the instances after transfusion into leg veins were probably due to fluid leaking into the partment along the tendons. This explanation is reasonable, especially to those of us who have n a smart walk when out of condition and have rienced that agonising pain in the shins which ws. Diagnosis should not be difficult if the condition me in mind, but it is as well to realise that it is not tical with Volkmann's ischæmia, which is usually ciated with a fracture or other severe injury and affect every muscle below the knee.

is surprising that the syndrome is so rare, considering many young recruits nowadays take more violent cise than they are accustomed to. Any complaint ain at this site during exertion should be taken usly, and complete rest ordered if any induration is for spontaneous recovery is possible if paralysis not yet appeared. If paralysis does develop there ld be no delay in performing immediate surgical mpression of the whole of the anterior tibial partment by incising the deep fascia.

ASCITES AND HEPATIC CIRRHOSIS

E accumulation of ascitic fluid in quantities necessi- g repeated paracentesis is one of the most distressing ires of hepatic cirrhosis. Several factors are involved is disturbance of the normal balance between the compartments of the blood and of the peritoneal y, and much can be done to correct it, apart from t mechanical removal of the accumulated fluid.

rtal hypertension has for long been recognised as a mon sequel of hepatic cirrhosis, which favours the ation of ascitic fluid by increasing the filtration ure in the splanchnic capillaries. In the early stages rrhosis compression of the liver sinusoids by the fat- a liver cells probably plays an important part in the sis of portal hypertension, and relief of this compres- by the action of lipotropic dietary factors may unt for some of the clinical improvement obtained ietetic means. At a later stage the disturbances of hepatic circulation are of a more permanent kind[1] unlikely to be influenced by simple dietary measures. such a case, owing to hæmatemesis or other compli- ns, reduction in portal hypertension seems essential, urse must be had to some form of short-circuit ation such as anastomosis of the portal to the left l vein.[2] Owing partly to impairment of appetite, y to loss of protein in the ascitic fluid, and partly mpaired protein synthesis by the damaged liver, nts with hepatic cirrhosis often show gross dis- ances of their serum-protein. A pronounced fall in serum-albumin, with or without a rise in globulin, e most usual finding and is associated with a con- able fall in the osmotic pressure of the total serum- ein. This too favours the formation of ascitic fluid, several attempts have been made to influence it giving concentrated human serum-albumin intra- usly. The results have been almost uniformly dis- inting, and both Patek and others[3] and Faloon and rs[4] conclude that ascites is not primarily determined he plasma-albumin level but by alterations in water salt metabolism. Disturbance of water metabolism has recently been noted[5] in infective hepatitis, and recovery is often signalled by a diuresis. Ralli and others[6] have shown that this retention of water in hepatitis is associated with an excessive excretion in the urine of an antidiuretic agent which returns to normal when the patient recovers. The usually accepted explanation is that the liver normally inactivates the antidiuretic agent, and that in hepatitis and cirrhosis this inactivation may become impaired. Farnsworth and Krakusin,[7] moreover, have found that cirrhosis with ascites is associated with a well-marked retention of sodium and water despite normal renal function, which implies that the kidney is behaving as though the body were dehydrated. This too suggests that an antidiuretic factor is active.

With the mechanism of ascites formation so far elucidated it is not surprising to find that severe restriction of dietary sodium may result in a dramatic reabsorption of ascitic fluid. Layne and Schemm,[8] and Eisenmenger and others[9] have reported on two small series of cases in which severe salt restriction was followed by striking clinical improvement. In the cases of Eisenmenger et al. the critical level of sodium intake was 1·0–1·2 g. per day. With the intake restricted to this level for three months patients formerly requiring repeated paracentesis not only lost their ascites but could tolerate more or less normal quantities of salt. The serum-proteins in these cases also returned to or towards normal, partly because there was no longer a loss of protein into the peritoneal cavity, and partly because of improved protein synthesis by the liver. It seems therefore that, in many cases of ascites resulting from cirrhosis, sodium retention by the kidney, acting under the influence of an excess of an antidiuretic substance, is a major factor. Since in ascites, as in œdema, water follows salt, restriction of sodium intake restricts the retention of water. The actual reduction of already formed ascites, however, implies more than this. A daily intake of only 1 g. of sodium chloride leads to a slight negative sodium balance which after some weeks or months must reach a point where the production by the pituitary of the antidiuretic hormone is reduced. At this point a sudden rise in the urinary excretion of salt will occur, as Eisenmenger et al. noticed in their patients, and it is at this stage that reabsorption of existing ascitic fluid may be expected.

DISTRIBUTION OF AUREOMYCIN AND CHLOROMYCETIN

WHILE these two antibiotics are scarce and costly the Ministry of Health is purchasing all the available supplies and will distribute them through the regional hospital board centres previously used for distributing streptomycin; a list of the centres will be found in our news columns. Hospitals outside the National Health Service can obtain aureomycin and chloromycetin from these centres on payment. The arrangements will take effect from Nov. 21. For the present the use of these drugs will be restricted to the treatment of the following conditions:

Aureomycin.—Suspected cases of ornithosis; proved cases of undulant fever (brucellosis) and lymphogranuloma inguinale; and severe cases of atypical pneumonia in which there is good reason to believe that the cause is a virus.

Chloromycetin.—Suspected cases of ornithosis; proved cases of undulant fever (brucellosis), lymphogranuloma inguinale, typhoid fever, paratyphoid fever (severe), and salmonella septicæmia.

These categories may be added to from time to time in the light of current expert advice.

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we can.” And so they did; the discussion ranged profitably over the deficiencies in the service which now irritate and sometimes dismay. Nevertheless, it may be doubted whether the meeting really fulfilled the intention of its sponsors. The hundred or so people who came included, as well as the committee itself, representatives of organisations directly concerned in running the hospitals and allied medical services, such as the regional board, the L.C.C., and the Emergency Bed Service; and an observation by a committee member on alleged laggardness by the regional board was a valuable reminder of the continuing need for those at the various levels to get together and argue out their difficulties and resentments. Plainly, however, this was not a business meeting to review coördination, for also present were spokesmen from a large number of local bodies. These are key citizens of a type from which the house committees and the management committee itself are recruited; and if the intention was to enlighten, and enlist the support of, this group then the meeting may be said to have succeeded. But, so far as the people of Lewisham were concerned, it was a meeting not of shareholders but of proxies. Questions and complaints could of course be addressed to the meeting through them; but not everyone belongs to a society or is prepared to have his case presented by a third party; there is no more personal affair than illness, and a reply at second hand, after this fashion, is surely likely to prove less satisfying than a direct note to, and answer from, the hospital.

These objections have been largely circumvented by the neighbouring committee at Farnborough. This committee serves a large semi-suburban district which includes Bromley, Beckenham, and Sydenham; and committee members have addressed public meetings and answered questions at three different points in the area. Often the questions or complaints were trivial; and thus current hospital administration was probably probed less deeply than at the Lewisham meeting. But each of these three meetings afforded the interested or the disgruntled a chance to address themselves directly to those actually administering the local hospitals—a process well calculated to promote interest and dispel any lingering impression of cold bureaucracy. In public relations further patterns will no doubt be evolved; and if, on the whole, the tentative design at Lewisham seems less attractive than that at Farnborough, it is better than no design at all.

MEDICAL BIOPSIES

Of late years great strides have been made in the techniques of aspiration, or needle, biopsy. Reviewing this field at a meeting of the Medical Society of London last Monday, Dr. R. Bodley Scott recalled that the wide practice of bone-marrow biopsy dates from 1929, when Arinkin devised the sternal-puncture needle; and with the single exception of the discovery of the liver treatment of pernicious anæmia, this, he said, is the most important advance in hæmatology in the past quarter-century. The sternum is the site usually chosen, though in children under 5 years and in patients with a hæmorrhagic state, puncture of the iliac crest is safer. One of the discoveries emerging from the growing practice of marrow biopsy is that myelomatosis is much less rare than was once thought—during the past year Dr. Bodley Scott has seen on average one fresh case a month. He went on to emphasise that marrow biopsy is indispensable before undertaking splenectomy for what is believed to be idiopathic thrombocytopenic purpura; for if marrow puncture shows no megakaryocytes the diagnosis is probably wrong and splenectomy will certainly be useless. He is somewhat reserved in his estimation of the value of lymph-gland biopsy, though it “will avoid the full operative panoply which surgeons deem necessary for excision of the smallest and most superficial lymph-node,” and it will often establish a diagnosis of carcinoma or perhaps of Boeck's sarcoid. Splenic ture has proved itself in the diagnosis of kala but, he suggested, it is not justifiable if diagnosis be made by some safer method. As regards “l puncture” in the diagnosis of neoplasms, this enta the risk of pneumothorax and of hæmoptysis, but th more serious alternative is thoracotomy. It is prob best to insert the needle under the radioscopic screen; bu if this is impracticable the tumour can be accurately loc ised by placing the X-ray film against the patient's che

Dealing specifically with liver puncture, Dr. R. Terry showed that among 3649 cases reported in rec years there have been only 7 deaths—a mortality 0·19%. Fully 90% of his patients feel no pain at t operation; and if they do have pain he attributes t to his own carelessness in applying local anæsthe The limitations, apart from the slight risk of fatali are: (1) failure to get a specimen; (2) the risk of obtai ing a specimen from a normal part of a liver whi elsewhere is abnormal; and (3) the difficulty of inter tation in very early and very late jaundice. Dr. Te listed the indications for biopsy under these headi (1) jaundice of uncertain origin; (2) hepatic enlargem of unknown origin; (3) malignant disease; (4) hep disease in which the diagnosis is otherwise difficu (5) obscure systemic disease where other diagnos methods have failed; (6) investigation of portal hyp tension, splenomegaly, and hypersplenism; (7) inves gation of the hepatic condition in constrictive pe carditis; and (8) evaluation of treatment in fat infiltration of the liver, [illegible] jaundice a infective hepatitis. To [illegible] added those cases where, 6–9 months after jaundic patients complain of lassitude and anorexia, witho other apparent disorder except possibly a rather lo serum-albumin; here biopsy may reveal continui hepatic disorder, which if untreated will progress b with treatment will clear up.

ANTERIOR TIBIAL SYNDROME

During the last few years there have been sever reports, mostly from the United States, of acute ischæm necrosis affecting the muscles of the anterior tib compartment of the lower leg after exertion. On anoth page, Barham Carter and his colleagues describe 9 simila cases in fit young men, seen in four British hospital In 7 of these severe pain in the shin came o during or soon after strenuous use of the limb—th right leg was affected in 5 of the cases—and was followe by signs of inflammation of the overlying skin and lo of power to dorsiflex the foot or toes. The other 2 patient developed symptoms after a blood-transfusion into th leg veins for shock following injuries to other par of the body. The affected muscles became hard an woody, and they were so contracted that the patien did not get a gross drop-foot deformity in spite of th loss of active dorsiflexion. With this there was complet lack of response to electrical stimulation in most instance a silent electromyogram, and the biopsy finding o ischæmia and necrosis. Sometimes, too, there wa evidence of a compression lesion of the anterior tibial nerve, causing anæsthesia in the first interdigital cleft on the dorsum and a reversible paresis of the extensor digitorum brevis. Of the three muscles in the compartment, the most vulnerable appeared to be extensor hallucis longus, then tibialis anterior, while extensor digitorum longus seemed most likely to escape damage.

Barham Carter and his colleagues review the various speculations as to the cause of the syndrome and feel doubtful about the general acceptance of arterial spasm or thrombosis as responsible; for later clinical, oscillometric, and arteriographic examination of the leg circulation reveals no abnormality of any kind. They believe uraging. It can only be hoped that appreciation of gravity of the situation may lead to sufficient nteers coming forward.

omiciliary treatment is a valuable adjunct which ease the problem, but is only a second-best when pared with true hospital facilities. It can at present completely with only a comparatively small part—between 10% and 25%—of the patients in need of tment.

y thanks are due to my colleagues and the staff of Harrow t Clinic who have taken part in the domiciliary treatment, to Miss Jewell and Miss Lacey who have assisted in king the figures for this paper.

HE HOME TREATMENT OF PULMONARY TUBERCULOSIS

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CHEST PHYSICIAN, READING

HE past fifty years have seen a greater expansion of lical knowledge than any previous period of history, this has focused attention on hospitals as centres the treatment of disease. Hospitals must always be eminent in the field of research, and for the nursing e of those who cannot be looked after at home: but re is no a-priori reason why any institution should itinue to be a place for the routine management of people if the proper treatment can be given in the mal environment of the patient's home.

During the past decade developments in tuberculosis apy have greatly extended the range of cases for om substantial benefit can be anticipated, and this st lead to either a greater demand for hospital beds else satisfactory treatment in the patient's own home. prime task for the present era of medical progress is apply the more complicated therapeutic devices outle the artificial and highly specialised atmosphere of e hospital. This is necessary because of the shortage nurses, but it is also desirable because the average glish home in the middle of the 20th century is a more itable place for medical treatment than it was twenty thirty years ago. Pioneer efforts in the domiciliary atment of disease are also being made outside the ld of tuberculosis; but, because the patient with thisis may occupy a bed for many months, the lead ven by various chest physicians in the London ea in domiciliary collapse therapy is especially luable.

Real rest is an essential in the management of phthisis. owadays, however, when more and more patients may nefit from collapse treatment or chemotherapy, it is ually important that the physician in charge of the tient shall not remain contented to add a name to a aiting-list that may entail many weeks' delay, but shall t about forthwith preparing every suitable patient for propriate collapse treatment at the appropriate time. ccessful treatment is the more successful if it can be ective with the minimum delay; this is not to vocate the so-called "crash pneumothorax" but to plore the almost nonchalant attitude that sometimes ists toward the ponderous waiting-lists for some natoria. Masterly administration could do much to leviate this situation immediately.

ARRANGING CARE AT HOME

Most people have a home, and most families are ually glad to participate in the care of a sick relative, they can have help and guidance. Care must be ken, however, to choose the right case for domiciliary easures. In the first place, the tuberculosis health isitor should visit the home as soon as possible after iagnosis to make a tentative assessment of the practicability of nursing the patient there, paying particular attention to certain aspects of the household. There should be two relatives or close friends (one at least living in the house) of suitable disposition to care for a sick person. The patient must be able to have a room to himself or herself suitable in size and outlook for prolonged bed rest without overcrowding the rest of the household excessively. Toilet and washing facilities must be easily accessible. The house must not be too remote for the physician to answer a summons to an emergency.

If conditions are favourable for home treatment, and the patient's own doctor agrees, then the welfare officer should make the necessary arrangements to maintain the economic stability of the family, with provision of home helps where necessary, boarding-out of children, and perhaps "meals-on-wheels." The guiding principle should be that since the patient is relinquishing his claim to "*free*" hospital treatment, he must not be financially penalised. Since the bed resources of the State are being relieved, the State should assist the family finances appropriately. Some financial adjustment may be necessary between the regional hospital board, the local health authority, and the National Assistance Board: but that need not concern the patient.

The tuberculosis health visitor should call frequently at first to teach the regimen. She has to answer the family's questions, to plan rest-hours, to put a check on sympathetic visitors, and above all to teach the patient the art of resting—which has been forgotten in the hurly-burly of modern society! The help of the district nurse can usually be enlisted to keep the patient's chart and to explain to the responsible relatives their part in the nursing work, which can well be left under her supervision. "Absolute" rest is out of place in the home, and the case for which this is really necessary merits a week or two's priority of place in hospital. Diversional therapy should be arranged when this is prescribed. The physician should make a weekly visit as a captain inspecting his ship (sometimes in company with the general practitioner if possible), and these weekly calls should be a regular feature of management quite apart from whether necessary later on for refills. Whether a pneumothorax should be started at home, or the patient have a week or two in hospital is a matter for individual judgment, as is the question of managing refills wholly at home or using the hospital car service to bring the mountain to Mahomet for screening control. Some physicians carry portable fluoroscopy apparatus, and though this slows their travelling-rate, and therefore the number of cases that can be visited in a session, it enhances the standard of medical care that can be given. Streptomycin can be perfectly well given diurnally by the district nurses, who usually welcome the opportunity to assist in such work. Pneumoperitoneum refills can be given at the physician's weekly visit. The patient must go to hospital for thoracoscopy or phrenic crush, but after two or three weeks for the former, or days for the latter, he can usually return home.

Behind a programme of home treatment must be the safeguard of a vacant hospital bed ready at any moment to take in the patient who should need it. Mother may get flu, a complication may supervene, or the physician may decide that the experiment (for every case should be regarded as such) is not proving successful. Some patients settle better with a short initial period in hospital. It must be a sine-qua-non that the physician conducting complete initial home treatment for tuberculosis will have hospital beds under his immediate control.

REGIMEN AND MORALE

One can never satisfy the querulous that home treatment can be as effective as disciplined sanatorium

Special Articles

THE TUBERCULOSIS SITUATION

WAITING-LISTS AND DOMICILIARY TREATMENT

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IN many parts of the country the position of the tuberculous patient is becoming desperate. The following observations on the position in one region and in one of its chest clinics may illustrate the state of affairs. In the Metropolitan regions some of the worsening of the problem is due to the fact that a large number of beds in the provinces, which were formerly used for patients from the Metropolitan area, are now required for local patients.

A REGION

The population of the North West Metropolitan hospital region is estimated to be about $3\frac{3}{4}$ million. So far as can be ascertained, the number of cases of respiratory tuberculosis on the chest-clinic registers in the geographical area at the beginning of 1948 was at least 21,000, and on Dec. 31, 1948, it was over 22,000. Allowing for removal of cases through recovery, death, change of residence, &c. there was therefore a net increase of about 4·7% in the cases known to the chest clinics, and probably there will be an increase at least as large during 1949. On Dec. 31, 1948, the waiting-list for admission contained nearly 1250 names; by September, 1949, the list had risen to approximately 2000. The hospitals of the North West Metropolitan regional hospital board have about 1850 beds for pulmonary tuberculosis, and a further 300 patients are still in hospitals not belonging to the board. The number of annual deaths from respiratory tuberculosis for the region (calculated from the latest figures available for London and Middlesex) is approximately 1650. Instead of the $2\frac{1}{2}$–3 usually regarded as adequate, the region has in fact for its use about $1\frac{1}{4}$ beds per annual death.

It can be seen, therefore, that 0·6% of the population of the region is known to the chest clinics—a proportion tending to rise at the present time by over 4% per annum. There are over 3850 tuberculous cases in need of hospital type treatment and only 2150 beds in which to treat them.

Much has been said recently about the necessity of bringing hospital care into the home. This has applied particularly to the chronic sick and to the aged. Much has also been done for the tuberculous on similar lines; but it must be remembered that many cases of tuberculosis are treatable and should be classed as acute and not as chronic sick. It is necessary to make use to a considerable extent of the services provided by local health authorities—e.g., welfare work, home nursing, home helps, car transport of patients for radiography, bedding and nursing requisites, boarding-out of children, and domiciliary occupational (recreational) therapy. Unfortunately, however, in many counties a charge is now made for some of these services, which were formerly provided free. A number of chest clinics in the North West Metropolitan hospital region have schemes for domiciliary treatment, including collapse measures. Their scope depends on the staff and facilities available at the various clinics.

During $7\frac{1}{2}$ months, 1666 names were removed from the regional waiting-list: of these 1214 patients were admitted, 69 died awaiting admission,* and 204 removed as "refused treatment," or "removed region"; but 179, as a result of domiciliary treatment a period of up to eight to nine months, had progre sufficiently well for the application for hospital admissio to be cancelled. This, from the point of view of patient treated, equals in value one of the smaller chest hospita of, say, 180 beds.

A CLINIC

Harrow Chest Clinic serves a population of ov 200,000. In October, 1946, when it first became a independent clinic, the number on the register was 37 It is now 1440. Some, but by no means all, of th increase is due to the development of a new Lond County Council housing estate in the area, where som tuberculous families are given priority in rehousin The number of patients awaiting chest hospit (sanatorium) admission at present is 109.

Our policy is to plan the management of the ca —from the medical, social, and preventive aspects—o comprehensive lines and to arrange that suitable tre ment is given while the patient is awaiting admissio In some cases domiciliary treatment may result admission becoming unnecessary; in others the patie enters hospital with the initial stages of his treatme over; in yet others unfortunately little can be done o a domiciliary basis, particularly when the patient uncoöperative, or the home conditions (lodgings f example) cannot be made satisfactory. To provide suitab basic conditions it is necessary to rely to a considerab extent on the local-authority services already mentione The medical measures employed at home are first rest, reinforced by posture, avoidance of coughin pneumoperitoneum, phrenic crush as an outpatient occasionally pneumothorax, and *p*-aminosalicylic ac as is appropriate. Some patients are admitted to th very limited number of beds under the direct control o the chest-clinic physician, for the minimum practicabl length of stay, for other methods of treatment (e.g. induction of pneumothorax or administration of strepto mycin). As a by-product, the environmental aspects o the case probably receive even greater attentio than they would if domiciliary treatment was not undertaken.

Adopting these measures, of 153 cases put on the waiting-list during a twelve-month period, 27 have improved sufficiently to make sanatorium admission unnecessary.

These figures are given to illustrate the position with which tuberculosis physicians are faced today. The clinic domiciliary-treatment results must have been bettered elsewhere. The achievements of other chest clinic physicians—some of them near neighbours—excite envious admiration. The greater use, in suitable cases, of domiciliary artificial pneumothorax has much to recommend it, but requires courage and a nice judgment, for in unskilled hands it is potentially dangerous.

CONCLUSIONS

Tuberculosis is primarily a disease of young adults, economically probably the most valuable section of the population. In consequence, and because of its prevalence, it is the most important single disease with which at present we have to deal. The situation of its victims is a very serious one, which appears to be becoming worse because of an increase in the numbers requiring treatment.

The beds available are *fantastically* inadequate; and, owing to the difficulties of finding nursing staff, the prospect of opening an adequate number of beds is far from nt—shall I say ?—" examinee." This type can be ised in thirty seconds. The thing to do then is me a question requiring a lengthy answer, such as cribe the gastro-intestinal tract." The weary ner can then snatch four minutes' complete relaxa- nd be fighting fit when the bell goes for the next date. I was amazed when one such nurse (I mean nee), asked to describe the formation of urine, d out, "Oh, I'm so glad you asked me that! een willing you to do it." Shades of the Piddingtons! as a bonny girl (and I don't mean examinee), and h I stuck strictly to the syllabus she was blushing she went out. I wonder if there *is* anything in this ht-transference business ?

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* Of these 36 were hopeless cases when put on the waiting-list.

grounds of the hospitals where the examinations eing held are plentifully signposted with the word the State Examination," complete with little arrow. s happened that outpatients have been misled in ay, and have presented themselves for examination Prelim room. One old lady, indignant and voluble, eard to demand a private examination. " Nobody's ; to State examine me," she shouted, as she was way to the proper place.

m always grateful to the sister tutors and hospital who so ably cope with the steady flow of candidates ply the wilting examiners with frequent cups of tea. too must be glad when the bell goes for the last d, and the examiners fold up their papers and steal , leaving the hospital to the comparative peace normal routine.

* * *

fine sense of exhilaration possessed us four boon panions as we ambled along through East Anglia he crisp clear November air. Crowded surgeries, ficates, and " bob prescriptions " mattered not at Soon, but not too soon, we had thirsts and appetites ming English gentlemen and were glad when we pened on a goodly hostelry. As we filed into the cosy less dining-room a big log fire in a Gothic arched fireplace gave a more than friendly welcome, and menu—mushroom soup, jugged hare with red-currant , biscuits and Stilton cheese—and a pint of local r bespoke a gracious meal. Looking around for the ter to take the order, we became aware that there was servery to the dining-room but only two entrances ectively marked *Ladies* and *Gentlemen*. In answer the bell an immaculate waiter emerged through the *tlemen* (fair enough !). Having placed the order we ld wash our hands ; still one of the graces before at. We opened our door and discovered " It " immedi- ly through a door to the right, while the kitchen and very occupied the opposite wall beyond. On the job chuckled, rather self-consciously I admit, for we well lised that our D.P.H. was now rather shabby and moded, derived as it had been by way of miasmas, demiology, and sanitary science, whereas this is the of positive health, gerontology, and social medicine. adwick rather than Ryle was our mentor. When we urned to the dining-room the most venturesome mber of the party could not resist the impulse to en the *Ladies*, but, confronted only by a flight of stairs, ready words " Sorry, Sir " died on his lips. There- er followed a merry lunch during which all agreed t the English hostelry still retains an indefinable mosphere. Quite by accident we had enriched our ech by a new idiom. And so, after the port and coffee your panel cheque still permits such hospitality to ur friends) : " Before we join the ladies, would any of u gentlemen like to see the kitchen ? "

* * *

They'd all gone and I was propping up Miss Joanna alker's R.G.50 against the ashtray when the waiting- om door opened and in he popped, the grocer's lad. simpleton, so 'twas said. " Do ee treat they Land irls at Moor House ? " he asked. " Yes, why ? " Do ee know Daisy ? " " Daisy who ? What's her urname ? " " That be what I want to find out." Why ? " (I didn't like the sound of this. The usual rouble I shouldn't wonder.) " 'Cos I want to send 'er postcard." I was sorry I couldn't oblige. But I must ell Daisy she has a smart lad as an admirer.

Letters to the Editor

REHABILITATION

SIR,—Rehabilitation is a popular word today ; but to most of us it remains no more than a word tacked on to the trilogy of Diagnosis, Prognosis, and Treatment. It should mean much more to every doctor practising clinical medicine. Despite our excellent schools of physiotherapy, it is still only too common to meet and hear of patients whose invalidism is increased because doctors ignore the principles of rehabilitation.

In a recent lecture, Dr. Howard Rusk, of New York, emphasised that the first aim of rehabilitation should be to make the patient independent. This may seem obvious, but unless we devote more time and work to making sure that each patient is helped to use his *remaining powers fully and imaginatively*, it cannot be achieved. Our aim must be to concentrate on details of the care of patients which will enable them to lead an independent and profitable life with minimum disability. When this aim is realised, perhaps one will not find in a top-floor room a young recent hemiplegic, with a reasonable prognosis for life, attending a London teaching hospital for electrical treatment, who has had no re-education in walking or speaking, whose joints are stiff, and who has never been given a stick to help him walk. Perhaps then one will not meet an adult who has lately had poliomyelitis, leaving him with an extensive trunk weakness, whose only treatment in an orthopædic hospital was a weekly communal-exercise class and who was discharged more or less straight from bed with no trunk support, no aftercare suggestions, and no introduction to the difficulties of resuming life at home. Perhaps then one will not read in your disability series of a doctor with a minimal spinal fracture having no physiotherapy and being quite unnecessarily confined to bed and an invalid's life for some months.

It is not only in such orthopædic cases that rehabilitation can help the individual and the community. For example, instruction in simple abdominal exercises and postural exercises can remove the need for thousands of specially prescribed corsets ; perineal exercises after delivery can restore the normal function of the pelvic floor, and save much misery. The list is long. The lesson it teaches is that it is a doctor's responsibility to teach his patients how to help themselves. Where patients have the good fortune to be cared for by enlightened doctors and good physiotherapists, their whole outlook is altered and their prognosis for effective recovery immeasurably improved. We must have more contact with our patients. Today I believe there is a temptation and a tendency to leave the patient's side and study the problem from afar.

Rehabilitation calls for the direct relationship—the human touch and the infectious determination which will animate patients and society and convince them that *restoration of function for big and little disabilities is* worth doing and can be done.

London, N.2. JEAN LAWRIE.

THE DISTINCTION AWARDS

SIR,—Dr. Walshe says that " To allow government to be our principal paymaster is one thing, but it is quite another to permit it to impose upon us a crude, arithmetical classification of all those imponderables that make up true distinction in our profession." But are we doing so ? If we look objectively at the proposed terms, a part-time consultant, professionally assessed, will earn from the Government by doing hospital sessions paid at a rate based on representations made by the profession to the independent Spens Committee. He will earn also by domiciliary work according to his merit in the eyes of general practitioners. To this may be routine. The newly diagnosed consumptive has a difficult phase of psychological adjustment to his disease, and one of the most important aspects of his management comprises wise and helpful guidance through this stage. Admission to sanatorium or hospital and contact with other patients or staff familiar with the new mode of life, may, (or may not!) help a great deal in attaining the necessary reorientation. A retreat is provided from the problems of everyday life which is of real therapeutic value in some instances. On the other hand, a patient can benefit greatly from the satisfaction of a loyal family rallying to his succour, and the determination to recover may be better fostered in such an atmosphere. It is a very real criticism of the present tendency to retain patients in sanatoria for many months that such prolonged segregation from the realities of life may engender a sense of lost social security on discharge. Such a dependent outlook on life readily leads to hypochondriasis, family disagreements, and a fear of resuming work, all of which detract substantially from the benefit of successful treatment for the purely organic aspect of the illness.

* * *

It should be a sobering thought for every tuberculosis physician that if a quarter of the treatable cases he diagnoses (a conservative estimate) could adequately have three-quarters of their treatment at home, sanatorium waiting-lists would disappear and a bed would be immediately available for every patient whose illness required it. It is well for us to remember the end, as well as the beginning, of Hippocrates's famous aphorism:

> "It is the duty of the physician not only to do that which immediately behoves him, but to secure the cooperation of the sick, of those in attendance, and all external agents."

NEW HEALTH DIRECTOR IN NEW ZEALAND

FROM OUR NEW ZEALAND CORRESPONDENT

THE impending retirement on superannuation of Dr. T. R. Ritchie, who has been director-general of health for three years in succession to Dr. M. H. Watt, has led to the designation as his successor of Dr. John Cairney by the Public Service Commission. The appointment is subject to the usual public service appeals. The commission was advised by a special committee consisting of Sir Charles Hercus, Dr. E. H. M. Luke, Mr. Douglas Robb, and Mr. P. E. Stainton.

Dr. Cairney, who is 51 years of age, is at present medical superintendent-in-chief to the Wellington Hospital Board, in whose service he has been since 1936. Previously he was medical superintendent of Hawera Hospital, and still earlier, demonstrator, lecturer, and finally associate professor of anatomy in the Otago medical school. He thus approaches his new task with full experience—and a great reputation—in the hospital field. This is recognised as at once the largest field within the department's duties, and the one requiring most attention. For years the machinery has been creaking, and coördination between the department and the local boards has been inadequate.

Dr. Cairney faces a formidable task. Not only the hospital system but also the hygiene work throughout the country needs improved conditions and organisation. In addition there has never yet been set up a structure to handle the numerous and important matters arising out of social-security legislation in New Zealand—now almost ten years old. His plans, therefore, will be followed with interest and hope by many. He has a great opportunity for achievement, and he has the general good will of the profession and the public behind him.

In England Now

A Running Commentary by Peripatetic Correspo

THE doctor on the telephone was worried. "I'm they must come in; they're not unconscious but they' ataxic, talking rubbish at the top of their voices, an quite uncontrollable." They were admitted as emergencies—two nice little boys, brothers, of eight and te When the H.P. saw them their condition had changed t extreme somnolence. There was no doubt about th previous condition, however, for their father gave good history, summing up by saying, "Of course I kno it couldn't be, doctor, because they've never ev tasted it, but it seemed just as though they we drunk."

Further inquiry established that an hour before the illness started the district nurse had given them both a infusion of quassia enema for threadworms. It seeme innocuous enough; but our H.P. pursued the subject an found that there are two infusions of quassia—o containing alcohol. The chemist dispensing the infusi hadn't known what it was for, the doctor hadn't specif which (did you know there were two?), so they rea were under the influence. They were much better n day, though they had rather a morning-after look abo them, and we all felt a little sorry that they hadn't ev had the pleasure of drinking the stuff.

Perhaps there is compensation in being the first have this complication of threadworms, and perhaps th first to become drunk per rectum. But were they drunk Or does the term imply that the alcohol was swallowed I must find out, too, what happened to the threadworm

* * *

Thank goodness that the oral examinations for th G.N.C. "Prelim" are to be abolished. I am convinced tha the fee I earn for examining in them does not compensa for the disruption of my ordinary medical work, the travelling, the living in hotels, the physical strain of bein immobilised on a (usually) hard seat for several hours o end (so to speak), and the mental strain of trying to co answers from unresponsive candidates. And it is astonishing how unresponsive many of them can be. At one time, used to think this shortcoming was due to large classes o indifferent teaching, but now I am sure that the inability of candidates to satisfy the examiners (and some ar satisfied with little) is due to lack of concentration on and interest in, the subjects to be studied. How els can one explain such staggering errors as "the femu has an atmospherical head"; "the anus is guarded b a spinster"; "the cows are examined by a tuberculou veteran"; and "one of the pigments is called biley virgin." In some years of teaching experience I have found only a mere handful of nurses who lacked the necessary intelligence to pass the Prelim. These can be excused. The real heart-breaking failures are the ones who could do well, but who "couldn't care less."

Only twice have I had candidates who scored no marks at all in anatomy and physiology, though in all fairness I should add that one of them correctly identified a large and life-like model of the human eye. The rest was silence and darkness over all.

The following conversation, which took place in a recent "oral," is a good example of cruelty to examiners

Me: "What germs might be found in contaminated water?"

Candidate (after deep thought): "Bâcteria."

Me: "Well then, what bacteria might be found &c., &c.?"

Candidate: "Micro-organisms."

Me (determined to see this through): "Well, what micro-organisms, &c., &c.?"

Candidate (triumphantly): "Germs!"

This is where I came in, I thought, as I passed her over to my colleague—a gentle middle-aged lady—who was soon informed that to pasteurise milk "you boil it at 105° to kill the bacteria," but with commendable restraint she did not fall into the trap by asking "what bacteria."

As a welcome relief from the girl (the G.N.C. says we must not say "nurse") who does not know the ischial tuberosity from the olecranon, comes the rare and n in coal workers,[5] differs in all the main pathological res (pigmentation, fibrosis, and focal emphysema) the true silicotic nodule as seen for instance in miners,[6] who inhale a dust predominantly siliceous mposition.[5] Airborne dust in South Wales coal- s and graphite contain relatively minor amounts of silica.[3 7] Although it cannot be denied that free may play some part in the genesis of pure dust is in coal workers and graphite workers, the *direct* of the major carbonaceous fraction of the inhaled must not be ignored. The most reasonable view s to be that simple pneumoconiosis in graphite as as coal workers is the result of a prolonged over- ng of the pulmonary mechanisms for disposal of culate matter by a dust which is largely inert in ct of tissue-reaction to it.

cordingly it is suggested that the massive lesions aphite workers are infective in nature and that the l, black, focal lesions scattered throughout the lungs ot represent a form of silicosis modified by a so-called terant dust but rather the response to overloading te lung with a predominantly carbonaceous dust h induces little fibrosis.

h National School
f Medicine, Cardiff.

A. G. HEPPLESTON
Senior Lecturer in Pathology.

HOSPITAL ADMINISTRATORS

R,—I cannot allow to pass unchallenged the arrange- t of the table, in your note last week (p. 923), showing in the Bromley group the administrative staff unt to only 1·27% of the total. Why are the 105 cal staff shown in a different section of the table? ly in the past our clerical departments, in whatever k they may have been engaged, have been regarded ne of our administrative charges when the annual pital costing has been prepared for submission to appropriate committee. Most of us are prepared to cede that there are good points both in medical and ay administration; but if we are to be presented with stical evidence, surely the figures chosen must be ctly comparable.

urthermore I feel that some clarification is needed as he exact interpretation to be placed upon the state- nt that "there may still be some superfluous ministrators in our hospitals." It is not clear whether s is an opinion expressed by the writer or a comment his report, but I am sure he will not feel aggrieved if sk whether medical superintendents are included ongst the redundancies. This point of view has been lely expressed during the past few years, but I often nder whether some of our younger lay administrators lise the extent to which they are now profiting from ir inheritance of hospitals for which some of the older dical administrators have been largely and personally ponsible.

Many of my colleagues will agree that in the days when were governed by boards of guardians, and to a tain extent under public assistance, medical adminis- tion was really tough. Often it was necessary to fight our hospitals and our patients in the face of the ost rigid economy. I well remember how I was once ked to explain in front of the full board why an instru- ent costing 8*s*. 6*d*. was essential for my small impro- ised theatre; now we have four major theatres in most constant use for which requisitions are never uestioned. For several years I was not permitted to old an antenatal clinic on the grounds that it would courage mothers to apply for hospital admission; ow we have an obstetric department which is regarded s one of the finest in the region.

To obtain improvements such as these involved long, wearisome, and often singlehanded contests extending over many years; and those who have been largely responsible should not I think be so lightly relegated to the limbo of the past as just "some of our superfluous administrators."

JOHN F. HACKWOOD
Chairman of the Medical Superintendents' Society,
London and Home Counties Branch; Surgeon-
Superintendent, Farnborough Hospital, Kent
(Bromley Group).

⁂ The table to which Mr. Hackwood refers appeared originally in the Bromley Group Hospital Management Committee's report for the period July 5, 1948, to March 31, 1949. The comment on "superfluous administrators" was ours, and it went on; "but it seems that the emergence into the management-committee's offices of clerks and others who formerly worked unseen in the local authority's medical division gives a faulty impression of fresh exuberance of numbers." We were considering only the apparent increase in office-workers, which in some hospitals has been the subject of adverse criticism by the medical staff.—ED. L.

INTERPRETATION OF VAGINAL SMEARS

SIR,—In their interesting article of Oct. 29 on the correlation of vaginal smears and mammary cancer, Dr. Walpole and Dr. Paterson have coined a new term— "mean smear index" (M.S.I.)—to signify the degree to which the vaginal mucosa is stimulated by œstrogens.

Since the normal menopausal smear may contain a preponderance of small or immature cells or, more commonly, a mixture of more mature cells, the starting-point must vary from case to case. The estimation of the degree of reaction or maturation for a given dose of stilbœstrol must therefore be different although the final cell smears may both be typical "stilbœstrol" smears.

The use of the "M.S.I." and the arbitrary use of numbers (index 0 up to 9) imply a precise knowledge of the degree of development of the mucosa. But consider the source of this index number. It is the mean of the impressions of maturity gained from examining several fields of smears on the first and sixth (or other) month of treatment. To me, therefore, M.S.I. means very little.

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Birmingham.

HUGH C. MCLAREN.

FREEDOM UNDER THE LAW

SIR,—The *Times* of Oct. 27 contains a report of Lord Justice Denning's third lecture on Freedom under the Law, in the course of which he is reported to have said that if doctors and dentists under the National Health Service injured their patients through negligence, the State would be liable to pay damages.

My contacts with medical men and lawyers lead me to think that the learned Lord Justice's observations are being misinterpreted by many members of the medical profession and are receiving a far wider construction than they can properly bear. It is wrongly assumed that a liability in the State to pay damages means an exclusive liability, and that the doctor or dentist, being relieved by the State from the personal liability which would otherwise attach to him in case of negligence, need no longer take the precautions which have hitherto been customary to guard himself against the risk of being sued for damages.

I therefore desire to emphasise that although in some cases there may well be a liability in the State, the doctor or dentist himself is also liable to be sued and probably will be sued concurrently, since the plaintiff gains certain technical advantage in having him as a defendant.

Unhappily the matter does not stop there, because the Ministry of Health have declared it to be their policy

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Simpson, F. W., Strachan, A. S. *Publ. S. Afr. Inst. med. Res.* 1935, 6, no. 36, p. 367.

Nagelschmidt, G. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1943, no. 244, p. 95.

added a merit award according as his fellow consultants judge him, and there will be added private work according to his professional standing. The sessions, domiciliary work, merit award, and private work which fall to him will depend upon his qualities of various kinds; and the final answer will be a function of four variables, flexible, far from crude; and, within the total that the Government feels expendable, determined very largely by professional arrangement and judgment.

Such analysis of the reward of the toiling human spirit in the field of medical science may seem repugnant. It is therefore worth while to refer to the leading article in *Nature* of Nov. 5, which speaks of the neglect not only of the medical but also of other professions to consider the problems which nationalisation presents to them, clearly delineated many years ago. It is notable that the article quotes Prof. A. N. Whitehead's criticism of the professions; and as, in his Harveian oration, Dr. Walshe said that he owed much to that philosopher, it is worth recalling what Whitehead wrote:

> "In the past," he said, "professionals have formed unprogressive castes. The point is that professionalism has now been mated with progress. The world is now faced with a self-evolving system which it cannot stop."

Had Dr. Boldero or Dr. Russell Brain written this, what would have been Dr. Walshe's devastating reply? And yet there can be only one answer—the answer of the colleges and the writer in *Nature*—that professional men "must accept a major responsibility for establishing and improving the channels of communication between knowlege and power and keeping them manifold and clear." To reject that responsibility is the real treason; and the worst retreat the profession can make is the retreat from reality.

Hove. W. A. BOURNE.

ACUTE MASTITIS

SIR,—I have followed the correspondence on this subject with interest. We, in the veterinary profession, have a considerable experience of this condition in the dairy cow, for it is regarded as one of the four major diseases afflicting the dairy industry. For instance, in these laboratories we have examined bacteriologically since the beginning of the year over 750 samples of milk from clinical cases of bovine mastitis in one veterinary practice alone. It is for these reasons that I should like to correct certain statements in Mr. Hogg's letter of Oct. 22 which I consider are misleading.

Although Mr. Hogg suggests that direct infusion of penicillin up the teat canal is preferable to systemic administration, he implies that it is still not settled whether the concentration achieved in the udder by systemic treatment is as satisfactory as that following teat infusion. Yet reports quite unequivocally agree that when penicillin is administered systemically (unless in enormous doses) practically none can be demonstrated in the milk; whereas when penicillin is injected directly up the teat canal, appreciable concentrations can be measured in the milk. The persistence of penicillin in the udder is influenced to some extent by the penicillin vehicle, and by the stage of lactation.

While I agree that it is a common farming practice to allow calves to suckle cows with mastitis and that it may be a sound treatment as far as the cow is concerned, I cannot but doubt whether it is sound to feed young calves on a mixture of blood, pus, and micro-organisms. Admittedly the calves appear to thrive, but one wonders how their bacteriological flora is affected and whether it may have any effect on their subsequent history as far as mastitis is concerned. We do not know, and it would take an elaborate and protracted experiment to provide the answer.

Finally, it would be most unfortunate if Mr. Hogg's letter gave the impression that penicillin preparations are directly available to farmers. The use of in the veterinary field is governed by exactly the legal safeguards as in the medical field—namely, terms of the Penicillin Act, 1947. In veterinary penicillin may be used only under the su the prescription, of a veterinary surgeon. Direct sup of penicillin to a farmer by a chemist without a veterin surgeon's prescription is against the law.

Boots Pure Drug Co. Ltd. Research Department,
Veterinary Science Division, Thurgarton, Notts. D. L. Hog

GRAPHITE PNEUMOCONIOSIS

SIR,—In your leading article of Sept. 17 attention drawn to the conclusion of Gloyne, Marshall, and Hoy and of Harding and Oliver[2] that graphite pneum coniosis represents a modified form of silicosis due the inhalation of a dust composed largely of carbonace material mixed with a small amount of free silica (of t order of 10% according to Harding and Oliver). The investigators draw an analogy between the pneum coniosis of graphite workers and that occurring coal workers.

From the descriptions and illustrations two typ lesion can apparently be recognised in graphite pneum coniosis. The first of these appears to be a small fo collection of black pigment with little fibrosis and distinct focal emphysema surrounding the pigment area, such lesions being scattered evenly througho the lungs. The second type of lesion is a pigment mass of dense fibrous tissue, often several inches acro tending to be situated in the upper and posterior pa of the lung and sometimes showing colliquative necro These latter lesions do not show obvious evidence tuberculosis.

Respectively the two types of lesion in graph workers correspond closely to the simple and infect forms of pneumoconiosis seen in coal workers.[3] Neither Gloyne and his colleagues nor Harding a Oliver, however, discuss the possibility of some lesio being due to the action of dust alone and others to t combined effect of dust and infection. The eviden justifying such a distinction in the disease of coal worke has already been presented, and, despite the absen of obvious tuberculosis in some massive lesions, reaso were adduced in favour of a tuberculous origin for them If the "conglomerate," "mixed," and massive lesion described in graphite workers were basically silicotic i nature (i.e., due primarily to the action of inhaled fr silica particles), they would be expected to assume much more uniform distribution, since inhaled du is deposited evenly throughout the lung parenchyma and to partake of the character of silicotic nodule (see below). Instead these lesions are restricted i location to areas of the lung commonly affected b chronic tuberculosis in those who have not been expo to an occupational dust hazard. Furthermore whorlin of fibrous tissue is not necessarily indicative of th action of free silica, since exactly similar effects may be produced by "healed" tuberculous foci. It thus seem that massive lesions in graphite workers should be regarded as infective in origin. Your leading article does refer to "massive progressive fibrosis of the lung superimposed on dust reticulation," thereby suggesting that the two manifestations are distinct, but no indication is given as to the nature of this distinction.

An argument against silica being the essential agent in the production of simple pneumoconiosis in both graphite and coal workers lies in the nature of the characteristic focal dust lesion. The latter, as already

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1. Gloyne, S. R., Marshall, G., Hoyle, C. *Thorax*, 1949, 4, 31.
2. Harding, H. E., Oliver, G. B. *Brit. J. industr. Med.* 1949, 6, 91.
3. Heppleston, A. G. *J. Path. Bact.* 1947, 59, 453.
4. Heppleston, A. G. *Trans. Instn Min. Engrs, Lond.* 1948-49, 108, 456.
5. Gough, J. *Occupat. Med.* 1947, 4, 86.

llocytes rose to 17·2%, with a subsequent increase ythrocytes from an initial 2,400,000 per c.mm. to ,000 per c.mm. within two weeks. A second case ed in a similar way.

artment of Internal Medicine,
it. Georg General Hospital,
Hamburg.

KURT HAUSMANN.

ANTIBIOTICS AND COAGULATION

t,—I should like to correct the impression, which annotation of Oct. 22 (p. 756) may have given, we have done any work on the influence of antis in thrombo-embolism. The presentation which de before the International Surgical Society was based alysis of 7 years' experience at the Charity Hospital ew Orleans. We have been interested in thrombolism for more than a decade and have felt that we able to prevent most cases of venous throm-, and to prevent fatality in those cases in which d occur by recognition of the phlebothrombosis and ion of the vein proximal to the site of the thrombus. were astounded, however, in our analysis to find there has been a tremendous increase in the incidence enous thrombosis and fatal pulmonary embolism he Charity Hospital in spite of all the measures h we have undertaken to prevent them.

ie study showed that there was an increase in the age yearly incidence of thrombo-embolism from o 124 during a period when the admissions increased 20%. The number of fatal cases of pulmonary olism in the last two years is approximately the e as in the previous five years, which represents an ase in the average yearly incidence from 20 to 52.

his study demonstrates that thrombo-embolism has nitely increased. Though we have not yet been able rove it, the suggestion was made that the increase hrombo-embolism might be due to the almost routine ninistration of antibiotics to hospitalised patients; at t, there is a parallelism between the two. Whether is a factor *or the sole factor cannot* be said at the ent time.

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lane University of Louisiana,
New Orleans.

ALTON OCHSNER.

PERFORATED PEPTIC ULCER AFTER GASTRO-ENTEROSTOMY

IR,—In his article of Oct. 8, Mr. Crowe observes that foration of a peptic ulcer shortly after gastroerostomy appears to be uncommon. The following e is somewhat similar to that described by him.

The patient, a man aged 32, was operated on by Mr. F. R. wn on June 16, 1949, when a wedge resection of a lesservature ulcer was carried out. He made an uneventful overy, and pathological examination of the ulcer confirmed t it was simple in nature. He was readmitted to hospital July 31 with shortness of breath and the story of having a sudden severe upper abdominal pain that day. The n had not eased, and when he was examined typical signs perforated ulcer were found. His abdomen was rigid and ere was a substantial amount of free fluid.

At operation on the same day the presence of free fluid is confirmed, and a small acute perforated ulcer was found st to the pyloric side of the anastomosis where the wedge d been removed. The perforation was closed by a series three stitches of catgut, and the abdomen was closed in ers. His wound healed satisfactorily and he was fit to ave hospital on Aug. 12. His general condition at that time as fairly poor; although he was about 6 ft. tall, his weight as only 9 st. 7 lb. However, when seen again recently, his eight had increased to 12 st., and he looked the very picture f health. He has not been dieted apart from being told to mit all heavy greasy food and spiced dishes, and he has had o complaint of abdominal discomfort.

Department of Surgery,
Medical School, Dundee.

JOHN GRIEVE.

HEAT CRAMPS

SIR,—I was much interested in the article of Nov. 5 by Dr. Ladell, having myself made some relatively insignificant observations on the same subject[1] when enjoying for that study—so far as environment goes—(to quote Sir Charles Martin) unrivalled opportunities.

Dr. Ladell remarks that heat cramps may occur when water is not drunk to excess or even when it is not drunk at all; this is true. It is also true that almost imperceptible changes in blood-chloride enable the balance in the affected muscle-fibres to be restored, after the administration of salt and water. Another fact is that the miners in Pendleton colliery put small amounts of cream of tartar (potassium bitartrate) in their drinking-water as a cramp preventive.[2] A further curious experience is that of Morton,[3] who administered 1–1$^1/_2$ pints of 2% sodium bicarbonate to his cases, with rapid improvement.

I do not think that cramps are a simple osmotic effect, as Dr. Ladell seems to imply; nor do I consider that muscular exertion is an essential preliminary. A cold environment, I have observed, makes the pain of heat cramps temporarily worse, and cold is a potent cause of muscular cramps even in temperate climes.

One of my patients was very worried in case the heat cramps, which occurred in muscle-fibres situated in parts of the body remote from each other, should spread to his heart. I tried to reassure him by saying that the heart-muscle had never been affected, so far as I knew. The patient remarked: "I might be the first case!"

Epping, Essex.

FRANK MARSH.

CURARE AND PRECIPITATE LABOUR

SIR,—As anæsthetists now use curare for upper-segment cæsarean section and for forceps deliveries, the following case-report may be of interest.

A primipara, aged 25, was admitted to hospital with acute appendicitis on Sept. 22, 1949. She was 38 weeks pregnant. Her temperature was 100·8°F and pulse-rate 130 per min. The abdomen was very tender, with localised guarding in the right iliac fossa. The chest was clear and the urine normal, and she had had no symptoms during her pregnancy.

At 6.20 P.M. she was given 'Omnopon' gr. $^1/_3$ and scopolamine gr. $^1/_{150}$ intravenously. At 6.25 P.M. anæsthesia was induced with a mixture of 10 ml. of thiopentone (5%) and 15 mg. of *d*-tubocurarine chloride (Duncan & Flockhart). Since the patient had had a little food and a drink a short time before, a cuffed tube was inserted. Anæsthesia was maintained with 45% nitrous oxide, 10% cyclopropane, and 45% oxygen. The operation started at 6.35 P.M. An acutely inflamed appendix was removed. Before closing the peritoneum the surgeon was requested to feel the uterus, which he said was as hard as a bullet. The operation was completed at 7.5 P.M. On leaving the theatre the patient was almost conscious; no neostigmine and atropine were necessary, and the fœtal heart was easily audible and beating at 120 per min.

The patient was quite comfortable in the ward until 9.30 P.M. when she requested a bedpan, which she did not use. At 9.45 P.M. she complained of sudden backache, and shortly afterwards labour pains became strong and frequent. At 10.20 P.M. a dead baby girl, weighing approximately 6 lb., was suddenly delivered. No postoperative drugs were given until 11.40 P.M., when the patient received heroin gr. $^1/_{12}$.

Even without curare, operation for appendicitis on pregnant women is said to be followed by abortion or premature labour in 40–80% of cases; and in view of the great increase in uterine tone produced by curare it would seem inadvisable to use it in operations of this type.

Scunthorpe, Lincs.

W. N. ROLLASON.

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1. Marsh, F. *Trans. R. Soc. trop. Med. Hyg.* 1930, 24, 277; *Ibid*, 1933, 27, 259; *Ibid*, 1935, 29, 309.
2. Moss, K. M. Gases, Dust, and Heat in Mines. London, 1917; p. 190.
3. Morton, T. C. S. *Proc. R. Soc. Med.* 1932, 25, 1263.

that hospital boards should, if it is sought to make them liable for negligent acts of a doctor, take such steps as are open to them under the Law Reform (Married Women and Tortfeasors) Act, 1935, to obtain a contribution from the doctor in respect of damages that may be recovered. (Under the Act such contribution may amount to a complete indemnity.) Whatever may be said for or against this policy, it is evident that common prudence demands in even greater measure than heretofore that medical and other practitioners, whether belonging to the whole-time staff of a hospital or otherwise engaged in the National Health Service, should guard themselves against the risks, both in respect of damages and costs, of actions for negligence. The professional man, whose reputation may be at a stake, cannot safely rely for his defence upon a hospital board, whose interests will conflict with his own. Not only does the State not relieve him of the burden of liability in such cases, but it now seems likely to assume the rôle of an assailant.

This is not the place to discuss whether Lord Justice Denning's extrajudicial observations as reported were intended to refer to all doctors and dentists engaged in the National Health Service, including general practitioners, or whether they are directed only to such doctors and dentists as are employed under a contract of service. It may well be that the narrower interpretation is the correct one; but that is a matter which may hereafter fall to be determined by the courts.

ALISTAIR FRENCH
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London, W.C.2.

LIVER EXTRACTS, VITAMIN B_{12}, AND THYMIDINE

SIR,—The diminished potency of purified liver extracts prepared during the post-war period from autolysed, so-called pharmaceutical, liver,[1] and other questions concerning vitamin B_{12}, have been repeatedly discussed in your journal. Investigations carried out here may therefore interest your readers.

All substances clinically examined by us have been prepared by Dr. K. Mulli (chemist). Altogether 100 patients with addisonian pernicious anæmia showed an optimal therapeutic response to a series of purified liver extracts, prepared from autolysed pharmaceutical liver by standard methods (Dakin-West, Laland-Klem, and others) and their modifications; and 12 patients reacted in the same way to intramuscular injections of cobalt-containing red pigments (issued in Germany under the name 'Pernipur'); this, we presume, may correspond with the substances described by Lester Smith.[2] The amounts of extracted solid matter and of original liver substance necessary to obtain optimal clinical results sometimes corresponded to pre-war findings,[3] and sometimes exceeded them considerably.[4]

With the methods mentioned above, and particularly precipitation with saturated ammonium-sulphate solution, considerable amounts of active substance will be lost, varying with the degree of autolysis. An active fraction from autolysed liver, not precipitable by saturated ammonium sulphate, soluble in phenol, and free of folic acid and thymine, with regard to the work of Davidson and Girdwood,[5] has been designated by us liver substance III.[6] On further purification this fraction proved to be a concentrate of a cobalt-containing red pigment, which seems to be a lower stage of vitamin B_{12}.[7] From the urine of healthy well as from the urine of patients with pernicious (3 cases), who received intramuscular injections of purified liver extracts, precipitable by sulphate, we were able to obtain concentrates ammonium sulphate which showed a clear action (5 clinical tests). Later on it was demonstra by microchemical analysis that these concentrates contained cobalt, equivalent to their presumable content vitamin B_{12}; but no cobalt-containing substan precipitable by ammonium sulphate, could be detec in these preparations.[7 8]

From sun-dried and air-dried cow-dung,[9] as well from broth-cultures of a strain of *Streptomyces gri* Mulli was *able to obtain—partly by chromatograp* methods—highly purified, cobalt-containing red stances. These concentrates, administered intramu larly in amounts which by microchemical cobalt analy *should be equivalent to about 250–1000 μg. of* vitamin were wholly ineffective in 7 cases of pernicious anæ However, following digestion with hog-stomach mu or with pancreatic-enzyme extract, the cow-dung fa *has shown clear hæmatopoietic activity.*[7]

In the light of these investigations, we assume that least three groups of different forms of vitamin B_{12} exist:

1. Cobalt-containing red compounds, which *on* int muscular injection, even in high doses, are ineffective pernicious anæmia, but with enzymatic cleavage will becom hæmatopoietically active. As precursors of vitamin (pre-vitamin B_{12} or vitamin-B_{12} conjugate, respectiv these are thought to correspond to the extrinsic factor Castle. To this group there probably belong various ot substances with so-called animal-protein-factor activity.
2. Cobalt-containing red pigments, clinically active precipitable by ammonium sulphate, as contained in puri liver extracts and described by Lester Smith.[2]
3. Cobalt-containing red pigments, clinically active soluble in ammonium sulphate, which are present especi in autolysed liver and in urine. These are believed to identical with the Wills factor, liver substance III, and growth-promoting factor of mosquito larvæ.[10]

Under the influence of certain enzymes, which propose to designate as vitamin-B_{12} conjugases and whic are to be found in stomach mucosa, pancreas, kidneys and presumably also in the liver, papain, moulds, an bacteria; the different forms of vitamin B_{12} may becom transformed one into the other and vary in *the liv* according to the degree of autolysis. By microchemica analysis of cobalt, as well as by biological assays of growth in chickens, rats, and moulds, we are not able to differentiate between hæmatopoietically active and inactive forms of the vitamin.

Purified liver extracts were prepared from the livers o two patients with pernicious anæmia who died of intercurrent disease. One patient had addisonian pernicious anæmia, and the other macrocytic anæmia associated with a sprue-like syndrome due to terminal ileitis during severe relapse only intramuscular injections of folic acid had been given. In two clinical trials the purified liver extracts from these sources showed clear therapeutic effect, which was due to their content of vitamin B_{12}.

A highly purified concentrate of thymidine, free of vitamin B_{12} and folic acid, was prepared from purified liver extracts. In one patient with pernicious anæmia where altogether 2 g. was given, after only 1 g. (administered intramuscularly in daily doses of 100–200 mg.) the megaloblastic marrow was restored *to normoblastic* an

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1. Wilkinson, J. F. *Lancet*, 1949, i, 239.
2. Smith, E. L. *Nature, Lond.* 1948, **162**, 144.
3. Ungley, C. C., Davidson, L. S. P., Wayne, E. J. *Lancet*, 1936, i, 349. Wilkinson, J. F. *Ibid*, p. 354.
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6. Hausmann, K. In a paper read before the biology section of the Hamburg Medical Association on May 13, 1947; *Dtsch. med. Wschr.* 1948, **73**, 203; *Klin. Wschr.* 1948, **26**, 504.
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8. Hausmann, K. *Z. Vitaminforsch.* (In the press); Aktuelle Probleme in Pathologie und Therapie. *Stuttgart*, 1949; p. 51.
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e greatest intellects of the world, Plato, Kant, and m philosophers like Whitehead, have shown us Science cannot give us the real picture of the rse, because what we call scientific facts are special s, imposed upon the real "thing in itself" by the ular structure of our intellect. Bergson, Eddington, Karl Jaspers, to quote only a few, have accepted another form of insight, and not the scientific od, is necessary for understanding the spiritual s. We have not the right to judge such spiritual s with the method of the test-tube and of the scope, nor to opine about religious matters without ing deeply the great world thinkers.

e problem of evil is, of course, a great stumbling- , but not only for the religious outlook. To conclude the presence of evil, and thus of disease, that thing is chance, absurdity, blind fate. a great dle, is not more rational than to accept the religious ion, which sees in evil the result of Original Sin, separation of man from God. A world in which tian principles would have a universal application d be a world without evil, because, free from wars, es, and injustices, the human reason would rapidly er physical handicaps. Would not nephritis or emia have been mastered if we had devoted to study the time and money devoted to the dis- ries of an instrument that can wipe out in a few days whole of human life? Evil is a product of man, not od. Everyone of us is responsible. as Dostoievski es, for everything towards everyone.

is the concentration of thought on our internal life, ecial privilege of man, that brings us nearer perennial h. It is by passing behind and beneath the outside of circumstance, beneath our outside self with its tuating moods, and facing the fact of our own indivi- l being that we understand that Science cannot lain human life and that there is another, a trans- lent reality that is the ultimate reality. By viewing essence of being, not in experiments on monkeys or s, not even in general, abstract principles, as in so y philosophies of the Hegelian type, but immediately nan's personal existence we find that man is not a endent creature, the mere product of Nature and iety, but a free spirit transcending itself in its reflection he Supreme Being. To prove things presented to us ernally, such as facts of biology and the principles of c, we have to prove their objectiveness and extrin- lity. Spiritual values, however, can only be appreci- d by the activity of the spirit itself, its intensity and ardour. All this is not Faith, but a well-known thod of philosophical thought which, of course, cannot applied to medical and biological problems, but is only method through which we can approach the blems of God, the Spirit, the Soul.

t here shows that we must impress upon our students nd this is what I endeavoured to do in my active ching days—that Science is to serve Humanity, and t its special method does not allow it to prove or prove religious views. For these, a special insight into e reality of Being, a deep, existential thinking, is cessary with the help of the great philosophers of the st and present.

It is not a coincidence that great physicians of the st were deeply religious: their intellect transcended e test-tube. The scientific humanism which Professor latt describes has given us some honest scientists, but so the atomic bomb. The Renaissance humanism, hich also considered the self-sufficiency of man, has sulted in the gas-chambers of the German Nazis. It a Christian humanism that is needed to save our ivilisation. We cannot, as physicians, adopt the com- ortable attitude of agnosticism or the agreeable behaviour f a juggler playing with the rival points of view of the universe. Such an attitude is allowed to those who have not to live nor act in earnest; but we physicians are living a real life of stress, danger, and responsibility. We have to act, and, thus, we have to choose.

London, W.1. A. P. CAWADIAS.

SIR,—These thoughts come into my mind as I read the admirable letters on this subject in your current issue:

1. Overwhelmed, like Blaise Pascal, whenever I contemplate the Infinite, I fail to see why an Infinite God should be expected to explain either Himself or His doings in full to His finite creatures. Were we in a position to understand fully the problem of cosmic Evil, we should, ourselves, surely be as God.

2. Professor Platt is appalled by the dominance of evil in the world. To me, too, there is far more evidence of a Devil than of God in its management. But was not this Christ's view also? On no less than three occasions He spoke of "the prince of this world" as His and man's adversary. Indeed, throughout His earthly ministry, He recognised a personal spiritual influence presenting evil thoughts to the minds of men which they were free to entertain or not. Was not it His avowed purpose to deliver mankind from the thraldom of the Evil One? The fact that his existence is denied by the greater part of "Christians" of this generation does not disprove it. Did not Baudelaire say that "the Devil's best ruse is to persuade us that he does not exist"?

3. Supposing that Professor Platt's Christless thesis is well founded, it would follow that life is one huge mistake. In such case is not the best never to have been and the second best to die? But, curiously, individual and race suicide to end the misery resulting from disease and man's moral failure does not seem to be a popular programme among agnostics.

4. Whatever be the origin of Evil, there is no doubt that the positive virtues demand it for their development. Is it unreasonable to believe that God overrules Evil for His own good purposes?

5. The end of the business is not yet. Christ offers mankind the prospect not only of a resurrection from the dead—a very different thing from mere survival—but also of His return, not this time in great humility, but in glorious majesty, to rule this tortured world in righteousness. Can Professor Platt offer a more pleasing prospect than that portrayed so vividly by another agnostic, Bertrand Russell, where there is no life beyond the grave, and "all the labours of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius are destined to extinction in the vast death of the solar system"?

6. As regard Professor Platt's creed, for an amusing description of the extraordinary divergence of views of "the least clouded and most elevated" non-Christian minds on such subjects as pleasure, virtue, and pity may I commend to his notice *The Human Situation*, written by the late W. Macneile Dixon from a non-Christian standpoint? That he (Professor Platt) and "the many earnest and beloved physicians who do not subscribe to any orthodox religion" have all been influenced to some extent by an environment which is still, in some measure, Christian, seems certain. That he relies for guidance on conscience is so interesting that one would like to know his opinion as to its origin. That he accepts the Christian ethic and not its author seems somehow illogical.

7. Is it scientific to dismiss a remedy as valueless without trying it out? Christ promises that he who seeks invariably finds. Is Professor Platt in possession of

MOTH-BALL ANÆMIA

SIR,—I was very interested to read your annotation of Oct. 29, since I had under my care in London in 1944 a similar case, which I did not publish.

A boy, aged about 3 years, was admitted to hospital with anæmia. He had been taken suddenly ill two days previously and had become rapidly worse. The day after the onset he began to pass dark urine. On admission he was gravely ill and profoundly anæmic, but he was not icteric. The hæmoglobin was less than 20%, and the red blood corpuscles numbered only a little over 1,000,000 per c.mm. The urine was a port-wine colour owing to hæmoglobinuria. The picture was that of an acute hæmolytic anæmia of Lederer type.

An immediate blood-transfusion was given, followed by a second one two days later. He recovered rapidly without relapse.

The mother volunteered the information that two days before he was taken ill the child had been discovered eating a moth-ball, and she was certain that he had swallowed at least half a one. I had one of the moth balls analysed, and it was found to consist of pure naphthalene. There was little doubt in my mind, therefore, that the acute hæmolytic anæmia was the result of naphthalene poisoning. Although I found statements in one or two textbooks that hæmolytic anæmia could be caused by naphthalene, I could find no report of a similar case.

London, W.1. GEORGE NEWNS.

LACRIMATION

SIR,—In your issue of July 9 Dr. Pickles wrote of involuntary lacrimation accompanying micturition. This has been observed by my son, aged 12, who also remarks that tears come into his eyes when yawning. The amount of tears seems to be about the same with each of these actions.

Wollongong, New South Wales,
Australia. M. C. MCKINNON.

THE DOCTOR'S CREED

SIR,—Professor Platt has opened a new chapter in a very old controversy, but some if not much of the conflict depends on the ambiguity in the terminology used.

The doctor's creed is his own affair and the less he says about it the better. But the doctor's values are totally different. According to his behaviour we can assess his philosophy and in so doing we gain an insight into the efficacy or the inefficacy of his religious teaching and experience.

Many religionists, Christian and otherwise, hold that belief in a particular scheme of dogmas is by itself adequate for the good life. Now we all know exceptions to this rule—men and women who claim 100% belief in the Bible or the Koran, but whose conduct in life does not express Christ's or Mahomet's philosophy. On the other hand, there are those—very few perhaps—who are unable to believe, and yet have acquired Christ's philosophy. In short, belief is not an adequate basis for philosophy. But the real trouble is the use of the word "belief" when the manifest content of a story covers a latent symbolic content of paramount and permanent value. If we take the story of Jonah in the whale's belly, the word "belief" is inappropriate; no intelligent adolescent takes it literally. Yet what proportion of adults are there who have learned the story in childhood and succeed in adult life to apprehend the latent message of rebirth contained in that story? Or how many of these adults have correlated it with the question Nicodemus put to Jesus? Or again, many young people have been taught Greek mythology and among other priceless myths have got to know the story of the Sowing of the Dragon's Teeth? No teachers have asked them to "believe" this story; yet the apprehension of its symbolical significance has a great contribution to to the philosophy of the adult. In short, religious and religious experience are imperfect if they do lead to maturity and a progressive scale of values. to the conflict between Science and Religion, I maint that Science has nothing to fear from Religion, as Religion has nothing to fear from Science. Science dea with the objectively demonstrable and is constant advancing its frontiers.

The religionists (and here it is the East which is mo at fault than the West) put forward certain guesses und the heading of dogma. They are all entitled to th guesses. Indeed the human mind is so constituted tha cannot endure the Unknown and the Unknowab without attempting to develop fantasies which a largely based on wish-fulfilment. They and we are free to entertain such fantasies. The young, the primitiv and the mentally inferior all demand personificati and objectivication in the Unknown. They and we free to believe what we like of such dogmas but to imp such "belief" is inadmissible. In other words, a may attain to Christ's philosophy by training experience; but the creed he holds may and does va not only from that of his neighbour, but also from th of his own childhood.

Harrow-on-the-Hill. H. CRICHTON-MILLER.

SIR,—Prof. Robert Platt's letter, arising out of t Archbishop of Canterbury's speech at Birmingha demonstrates again how strangely illogical we medic men can be when it comes to questions of philosophy a theology.

Having stated that he rejects the Christian creed, h attempts to justify the ethic which arises naturally fro that creed—on the flimsiest and most personal ground Why *should* our conduct be determined by "a sense personal responsibility," or by the inner satisfaction doing right? To whom are we to be personally respo sible, and why? How are we to know what is right a what is wrong? The undermining of religious belief, a the materialistic outlook which has evolved since th Reformation, has resulted in the product of such strange person as Professor Platt, who is conditioned behave as a Christian, although he cannot give a adequate reason why he does so.

In respect of Professor Platt's inability to accept th Christian creed, owing to his difficulty in imagining a omnipotent, benevolent, and merciful God who can ye tolerate evil, the rather infantile answers which h presumes will be forthcoming would not be given by an theologian.

The greatest gift that God could give to man surel was that of freedom of choice. That man chooses evil i unfortunate; but he frequently chooses what is good and, being an optimist, I see that the good in mankin on the whole greatly outweighs the evil. To create i creature devoid of this freedom of choice would have be to relegate us to the sphere of mere automata who coul neither have had "a sense of personal responsibility nor given greater glory to God. Péguy epitomised thi rather nicely when he said, "God, having once experi enced the love of free men, has no use for the obeisanc of slaves."

We should be grateful to the Archbishop of Canterbur for his clarion call to members of the medical professio to consider again the nature of man and his purpose.

T. CECIL GRAY.

Liverpool.

SIR,—Professor Platt shows in his letter a grea scientific sincerity and humanity. He makes, however the fundamental mistake of applying the scientifi method and reasoning to the transcendental question o religion, and of considering that the only alternativ is faith.

body. Three statements of Jesus are illuminating: not fear those who kill the body but cannot kill soul: rather fear Him Who can kill both body and in hell"; "He who loves his life loses it, and he hates his life in this world will keep it for eternal ': "the flesh profits nothing." Thus that which reasure so dearly—namely, life of the body—is, in sight of God, and therefore in reality, as nothing ared with that truly precious life of the spirit. ugh none of us expects the body to live for ever, nake the mistake of setting far too high a value it when faced with the possibility or fact of a.

t the subject of such sufferings as those endured e concentration camps the Word of God is equally inating and equally startling. The Old Testament the story of that nation which was given the job owing the other nations of the world what a wonder-hing life could be if lived in obedience to God. escribes the ghastly failure of that nation in God's ose owing to wilful, deliberate wickedness. Could d of Love allow free course to the sin which could g about nothing but the utter ruin not only of those indulged in it, but also of those who beheld and wed their example? No. He must needs punish e whom He loved, for punishment is intended arily to restore. But there were those who resisted y effort to restore, who remained a contaminating ce of infection to others, and thus we find that the t frightful wickedness calls forth the most frightful ishment—given only after clear and oft-repeated nings. Indeed the very things which Professor Platt rds as proof of the non-existence of God are those h, according to the Bible, God has used as ishments for man's wickedness.

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laînth, Dorset. P. R. BOUCHER.

R.,—The objection raised by Professor Platt to Fisher's affirmation is indeed not new. It is a serious , and could have been stated even more strongly. ect answers to it seem always to beg further questions those who are not Christians. To those who are, matter does not appear quite the same; and to gest, as might be done, that they either ignore evil blindly accept orthodoxy is to deny the reality of a at deal of Christian thought and action. May I ke two comments?

f a man demands that this objection be answered ore he can or will believe in the God the Christians rship, then in all humility I would say that I do think God can or will provide an answer to a free ature of His in such a prosecuting or judicial frame mind.

Second, I understand that in philosophy it has been t unfruitful when a question yields perplexing answers reconsider the question. I would respectfully suggest Professor Platt that he think over again the meanings intends by "omnipotent" and "wholly benevolent," d compare these meanings with those arrived at by hristian theologians of an intellectual stature equal to s own.

Helston, Cornwall. GEORGE JOHNSON.

SIR,—One of the best-known books written by H. G. ells is "The Story of a Simple Soul." I always feel, owever, that there is a simpler soul even than this, nd it is the person in the surgery who sometimes says: Why does my mother (or father, or whoever it may be) have to suffer from this terrible disease? She has never done any harm to anyone." That anyone of Dr. Platt's medical eminence should put out this self-same query more or less rather takes one's breath away. We know little still of the origin of many of the diseases which we have to treat; but we know that some are inherited; and what (so far as our present knowledge goes) is to prevent leukæmia and acute nephritis—to mention the two diseases referred to by Dr. Platt—being possibly inherited too? The influence of the misspent life (not necessarily sinful) of some distant ancestor may be carried down in the chromosomes of the victim of acute leukæmia, and we are merely having a repetition of the Biblical reminder that the sins of the fathers shall be visited upon the children unto the third and fourth generations.

The question of free will has been brought out by more than one of your correspondents. Man, who is clever enough to invent radar and television, should surely be intelligent enough to protect himself from man's inhumanity to man. Why should the Deity be expected always to lead him by the hand when he is so infernally clever himself? So many today think they have "grown out" of religion. The essence of Christianity is still simplicity and humility, but man—"that miserable two-forked radish" as Carlyle called him—is now too big for his boots. In spite of his apparent cleverness he remains at the mercy of his dictators and has to suffer all the horrors which they bring upon him. His sufferings should remind him of his own impotence; but they have not yet succeeded in doing so.

Brighton. G. L. DAVIES.

SIR,—Professor Platt has done us a good service in voicing the thoughts, rarely heard in public, of many doctors and of an increasing number of the rising generation. We easily forget the significance of the fact that our beliefs are largely determined by the circumstances of our upbringing. Those of us brought up in the Christian faith rarely question the teaching and the feeling that our religious experience results from our personal contact with the Creator. To many not so brought up, and their number is rapidly increasing, this idea appears to be without foundation. While having a great respect for the Archbishop of Canterbury and valuing his guidance on ethical matters they will be little influenced by his answers to the "three problems or mysteries."

The one thing that is common to the many sects of Christians is the fervent desire that Christ's way of life shall prevail. Now among people of Professor Platt's persuasion are many who wish for just the same end and who do not simply enjoy the benefits of the Christian spirit handed down to them but allow increase to that spirit in their lives and hand on that spirit to their children.

Those of us who are concerned, or would be concerned, with the future welfare of mankind will do well to remind ourselves of these facts constantly. We will do well to relegate our beliefs to a subordinate place and have faith in the Spirit of Christ that is abroad. Let those who stand outside the Church not throw stones at the windows but enter in and open them. Let those who are within the Church not pray for the unbelievers outside but open the doors and remove the stumbling-blocks to all those who sincerely desire to seek Christ's way of life.

Recent correspondence in the *Times* has shown again how apparently insuperable are the obstacles to unity within Christendom. Is it not time that there was another revolution within the Church? The alternative would seem to be a further loss of way and drift toward the rocks.

Bristol. HARRY F. WEST.

any evidence that this promise is vain? Pascal, one of the world's greatest scientists, declared that he, at any rate, could discover none.

London, W.1. J. W. LINNELL.

SIR,—The first step towards a clearer understanding of experience, both in religion and in science, has been taken when a distinction has been made between things that are both similar, and also significantly different. To call both "Buchenwald" and the death of an innocent "child from leukæmia," evil is to fail to recognise a significant difference. Most will agree that Buchenwald was predominantly man-made and that (so far as we know) leukæmia is predominantly due to natural causes. In this letter I shall use the word "evil" to describe "Buchenwald-like" conditions and consequences, and I shall use the word "bad," to describe the "bad" results produced by natural conditions. It might prove to be true to hold that God is in no sense "responsible" for evil, and yet was (in some sense) responsible for "bad"; and to do so without contradicting the basic religious insight that "God is Good." For my part I consider that modern Christian philosophers have succeeded in offering such an "explanation of evil" and that that explanation is rational, scientifically credible, and religiously satisfying.

Since, however, I am certain that neither religion nor science can make any satisfactory progress towards an understanding of the "problem of evil," until that problem has been restated in this dual form, I wish to draw attention to this significant difference. We are discussing two different problems, that require different explanation and are amenable to different methods of "cure." May I add also, that the good and the healthy call for just as much "explanation," as do the "bad" and the "evil."

Worcester. H. E. COLLIER.

SIR,—It has often been stated that it is impossible to accept the ethic of Christianity without accepting the doctrine. I believe this to be true, for the two are inseparable. He Who said, "Blessed are the peacemakers" also said, "Blessed are ye, when men shall revile you, and persecute you, and say all manner of evil against you falsely, for my sake." Without the acknowledgment of a Being higher than oneself, to Whom one is responsible moment by moment, practice of the Ethic is subject to qualification by the Ego which it is the Agnostic's goal to satisfy. A version of the Ethic, edited by a political conscience, may well serve to rally the masses for atomic warfare, but will it produce a Niemoller?

As for Professor Platt's "better hypothesis," provide me with a laboratory in a camp of starving men, and only let enough friends advise me that the end justifies the means, and I shall achieve the inner satisfaction of doing right by experimenting on, and expediting the end of, hundreds of people already doomed—and that in the cause of scientific truth. Regiment me with the rough, and teach me to admire my superiors, and how long will my conscience gainsay the impression that the gift of self-assertion and the grace of undetectability are the endowments most to be coveted? Replenish me with respect for truth and present me with the dilemma that a lie told just for once will ultimately further the cause of truth, and to what court shall my conscience take the conflicting claims of Propaganda and Information? Did ever a murderer fail to justify himself, to himself?

It is only my belief in a higher Judiciary that will keep the bench of my conscience alert to the "Thou shalt not" of the Bible, as against the special pleading of my own inclinations, always biased in favour of my own immediate interest as I see it in terms of a relatively short duration.

London, N.19. S. R.

SIR,—There are many thinking persons on the f of religion, and I believe that Dr. Platt's feelings those, not only of many earnest doctors, but of majority of medical men today. It is probably b to be an honest atheist or agnostic than simply believe because one has been brought up to bel The important thing is to try to think these things for ourselves, and here the Archbishop's address is helpful because it gives us something to bite on. E so, faith is a very difficult thing to acquire and it is a at the level of simplicity and humility that we obtain it.

The explanation of the presence of evil in the wo in spite of an omniscient, omnipotent, and wholly be volent God, has already been given by some of correspondents. It is a sequel to the endowme man with a will of his own to choose good or evil. made the world to be ruled by certain physical which for practical purposes never change; so we have a purely materialistic outlook if we wish. will not be proved scientifically, mathematically, b miracle, or in any other way unless faith is alre present. He is obvious enough in the works of na and yet remains almost incredible. Man, it seems, evolved with a mind just capable of comprehend the existence of an Almighty God, but the balance realisation is very finely adjusted. The initial appro must be made by the individual concerned and it not depend on mental development or reasoning pow in fact the simple-minded often find it easier to acq faith. The earth is the testing-ground; man's will m therefore be allowed to prevail on it.

The knowledge of the sum total of good and evi the world at any one time could explain many of world's evils. The atrocities of Buchenwald and Au witz are the indirect result of the intensity of evil, hatred, the greed for power, and the unscrupul domination of the Hitler régime: in other words, th were due to the development of evil in man and by m The child dying of leukæmia is, I admit, more diffic to explain, but the difficulty is not now one of explanation of the presence of evil, but of its distribut This distribution may remain incomprehensible to the without faith and is, I agree, a great barrier to t acceptance of Christianity; but to those who ha faith in Christ there is no difficulty at all. We have alrea been reminded by Dr. Carroll that the symbol Christianity is a Cross.

Having tried to explain the presence of evil a having discussed its distribution, it behoves us consider how to overcome it, and here again the answ is found in the teachings of Christ, "return good f evil."

Norwich. G. K. MCKE

SIR,—All Christian apologists appear to accept hum sorrow and suffering as a sign of a consequence of ma "having fallen from God." Would any of them ca to consider the case of a rabbit being eaten slowly by a weasel?

Buxton.

SIR,—I am sure that the important difficulty described by Professor Platt occurs only in the minds of those thinkers who have not seen the whole of the picture. The whole truth is to be obtained only from the study of the entire Bible, Old Testament and New.

The first thing to be understood is the true value of what is usually called "life," and refers to the life of ody. Three statements of Jesus are illuminating: not fear those who kill the body but cannot kill oul: rather fear Him Who can kill both body and in hell"; "He who loves his life loses it, and he hates his life in this world will keep it for eternal ; "the flesh profits nothing." Thus that which reasure so dearly—namely, life of the body—is, in ight of God, and therefore in reality, as nothing ared with that truly precious life of the spirit. ugh none of us expects the body to live for ever, ake the mistake of setting far too high a value it when faced with the possibility or fact of h.

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econd, I understand that in philosophy it has been unfruitful when a question yields perplexing answers reconsider the question. I would respectfully suggest Professor Platt that he think over again the meanings intends by "omnipotent" and "wholly benevolent," d compare these meanings with those arrived at by ristian theologians of an intellectual stature equal to own.

elston, Cornwall. GEORGE JOHNSON.

SIR,—One of the best-known books written by H. G. ells is "The Story of a Simple Soul." I always feel, wever, that there is a simpler soul even than this, d it is the person in the surgery who sometimes says: Why does my mother (or father, or whoever it may be) have to suffer from this terrible disease? She has never done any harm to anyone." That anyone of Dr. Platt's medical eminence should put out this self-same query more or less rather takes one's breath away. We know little still of the origin of many of the diseases which we have to treat; but we know that some are inherited; and what (so far as our present knowledge goes) is to prevent leukæmia and acute nephritis—to mention the two diseases referred to by Dr. Platt—being possibly inherited too? The influence of the misspent life (not necessarily sinful) of some distant ancestor may be carried down in the chromosomes of the victim of acute leukæmia, and we are merely having a repetition of the Biblical reminder that the sins of the fathers shall be visited upon the children unto the third and fourth generations.

The question of free will has been brought out by more than one of your correspondents. Man, who is clever enough to invent radar and television, should surely be intelligent enough to protect himself from man's inhumanity to man. Why should the Deity be expected always to lead him by the hand when he is so infernally clever himself? So many today think they have "*grown out*" of *religion*. The essence of Christianity is still simplicity and humility, but man—"that miserable two-forked radish" as Carlyle called him—is now too big for his boots. In spite of his apparent cleverness he remains at the mercy of his dictators and has to suffer all the horrors which they bring upon him. His sufferings should remind him of his own impotence; but they have not yet succeeded in doing so.

Brighton. G. L. DAVIES.

SIR,—Professor Platt has done us a good service in voicing the thoughts, rarely heard in public, of many doctors and of an increasing number of the rising generation. We easily forget the significance of the fact that our beliefs are largely determined by the circumstances of our upbringing. Those of us brought up in the Christian faith rarely question the teaching and the feeling that our religious experience results from our personal contact with the Creator. To many not so brought up, and their number is rapidly increasing, this idea appears to be without foundation. While having a great respect for the Archbishop of Canterbury and valuing his guidance on ethical matters they will be little influenced by his answers to the "three problems or mysteries."

The one thing that is common to the many sects of Christians is the fervent desire that Christ's way of life shall prevail. Now among people of Professor Platt's persuasion are many who wish for just the same end and who do not simply enjoy the benefits of the Christian spirit handed down to them but allow increase to that spirit in their lives and hand on that spirit to their *children*.

Those of us who are concerned, or would be concerned, with the future welfare of mankind will do well to remind ourselves of these facts constantly. We will do well to relegate our beliefs to a subordinate place and have faith in the Spirit of Christ that is abroad. Let those who stand outside the Church not throw stones at the windows but enter in and open them. Let those who are within the Church not pray for the unbelievers outside but open the doors and remove the stumbling-blocks to all those who sincerely desire to seek Christ's way of life.

Recent correspondence in the *Times* has shown again how apparently insuperable are the obstacles to unity within Christendom. Is it not time that there was another revolution within the Church? The alternative would seem to be a further loss of way and drift toward the rocks.

Bristol. HARRY F. WEST.

any evidence that this promise is vain? Pascal, one of the world's greatest scientists, declared that he, at any rate, could discover none.

London, W.1. J. W. LINNELL.

SIR,—The first step *towards* a clearer understanding of experience, both in religion and in science, has been *taken when* a distinction has been made between things *that* are both similar, and also significantly different. To call both "Buchenwald" and the death of an *innocent "child from leukæmia,"* evil *is to fail to* recognise a significant difference. Most will agree *that* Buchenwald was predominantly man-made and that (so *far* as *we know*) leukæmia is *predominantly* due to *natural* causes. In this letter I shall use the word "evil" *to* describe "Buchenwald-like" conditions and consequences, and I shall use the word "bad," to describe the "bad" results produced by natural conditions. It might *prove to be* true to hold that God is in *no sense* "responsible" for evil, and yet was (*in some sense*) responsible for "bad"; and to do so *without* contradicting the basic religious insight that "God is Good." For my part I consider that modern Christian philosophers have succeeded in offering such an "explanation of evil" *and that that* explanation is rational, scientifically credible, and religiously satisfying.

Since, however, I am certain that neither religion nor science can make any satisfactory progress towards an understanding of the "problem of evil," until that *problem has been restated in this dual form, I wish to* draw attention to this significant difference. We are *discussing* two different problems, that require different explanation and are amenable to different methods of "cure." May I add also, that the good and the healthy call for just as much "explanation," as do the "bad" and the "evil."

Worcester. H. E. COLLIER.

SIR,—It has *often* been stated that it is impossible to accept the ethic of Christianity without accepting the *doctrine. I* believe *this* to be true, for the two are *inseparable.* He Who said, "Blessed are the peacemakers" also said, "Blessed are ye, when men shall *revile you, and persecute you,* and *say all manner* of evil against you falsely, for my sake." Without the acknowledgment of a Being higher than oneself, to Whom *one* is *responsible* moment by moment, practice of the Ethic is subject to qualification by the Ego which *it is* the Agnostic's goal to satisfy. A version of the Ethic, edited by a political conscience, may well serve *to rally the masses for atomic warfare, but* will it produce a Niemoller?

As for Professor Platt's "better hypothesis," provide me with a laboratory in a camp of starving men, and only let enough friends advise me that the end justifies the means, and I shall achieve the inner satisfaction of doing right by experimenting on, and expediting the end of, hundreds of people *already doomed*—and that in the cause of scientific truth. Regiment me with the rough, and teach me to admire my superiors, and how long will my conscience gainsay the impression that the gift of self-assertion and the grace of undetectability are the endowments most to be coveted? Replenish me with respect for truth and present me with the dilemma that a lie *told just for* once will ultimately further the cause of truth, and to what court shall my conscience take the conflicting claims of Propaganda and Information? Did ever a murderer fail to justify himself, to himself?

It is only my belief in a higher Judiciary that will keep the bench of my conscience alert to the "Thou shalt not" of the Bible, as against the special pleading of my own inclinations, always biased in favour of my own *immediate interest* as I see it in terms of a *relatively short duration.*

London, N.19. S. R.

SIR,—There are many thinking persons on the of religion, and I believe that Dr. Platt's feeling those, not only of many earnest doctors, but of majority of medical men today. It is probably to be an honest atheist or agnostic than simp believe because one has been *brought up to be* The important thing is to try to think these things for ourselves, and here the Archbishop's address is helpful because it gives us something to bite on. so, faith is a very difficult thing to acquire and it is at the level of simplicity and humility that we obtain it.

The explanation of the presence of evil in the w *in spite of an* omniscient, omnipotent, and wholly volent God, has already been given by some of correspondents. It is a sequel to the endowme man with a will of his own to choose good or evil. made the world *to* be ruled by certain physical which for practical purposes never change; so we have a purely materialistic outlook if we wish. will not be proved scientifically, mathematically, miracle, or in any other way unless faith is alre *present.* He is *obvious* enough in the works of na and yet remains almost incredible. Man, it seems, evolved with a mind just capable of comprehend the existence of an Almighty God, but the balanc realisation is very finely adjusted. The initial appro must be made by the individual concerned and it not depend on mental development or reasoning po in fact the simple-minded often find it easier to acq faith. The earth is the testing-ground; man's will therefore be allowed to *prevail on it.*

The knowledge of the sum total of good and evi *the* world at any *one time* could explain many of world's evils. The atrocities of Buchenwald and Au witz are the indirect result of the intensity of evil, hatred, the greed for *power, and* the unscrupu domination of the Hitler régime: in other words, were due to the development of evil in man and by m The child dying of leukæmia is, I admit, more diffi to explain, but the difficulty is not now *one of* explanation of the *presence* of evil, but of its distribu This distribution may remain incomprehensible *to th* without faith and is, I agree, a great barrier to acceptance of Christianity; but to those who h faith in Christ there is no difficulty at all. We have alre been reminded by Dr. Carroll that the symbol Christianity is a Cross.

Having tried to explain the presence of evil a having *discussed its* distribution, it behoves us consider how to overcome it, and here again the ans is found in the teachings of Christ, "return good evil."

G. K. McKE

Norwich.

SIR,—All Christian apologists appear to accept huma sorrow and suffering as a sign of a consequence of ma "having *fallen from God.*" Would any of them ca to consider the *case* of a rabbit being eaten slowly b a weasel?

OINS.

Buxton.

SIR,—I am sure that the important difficulty describ by Professor Platt occurs only in the minds of tho *thinkers who* have *not* seen the whole of the pictu The whole truth is to be obtained only from *the stu of the entire* Bible, Old Testament and New.

The first thing to be understood is the true va of what is usually called "life," and refers *to the life* who had been unvaccinated at the time of contact, put under observation with symptoms of early pox. His illness is relatively mild.

original case may possibly have infected others g the pre-eruptive stage, but all contacts are believed under close surveillance and spread to the general is not expected.

Poliomyelitis

ring the week ended Nov. 5, notifications in England Vales were: poliomyelitis 318 (347), polioencepha- .2 (20). Figures for the previous week are shown rentheses. Prevalence is falling slowly but remains pread as is shown in the following list of counties which multiple cases were reported :

don 50 (55), Bedford 6 (2), Berks 7 (3), Buckingham Chester 16 (10), Derby 3 (2), Devon 3 (3), Dorset 7 (3), m 3 (2), Essex 24 (26), Gloucester 6 (9), Hereford 4 (2), ord 4 (9), Huntingdon 5 (0), Kent 15 (16), Lancaster), Leicester 12 (3), Lincs, Lindsey 5 (13), Middlesex), Norfolk 7 (5), Northampton 4 (1), Northumberland Nottingham 9 (8), Oxford 2 (2), Salop 2 (0), Somerset , Southampton 9 (13), Stafford 7 (3), Suffolk, East 2 (2), 6 (14), Sussex, East 5 (9), Warwick 7 (8), Westmorland Wiltshire 2 (1), Yorks, North Riding 2 (2), Yorks, West), Glamorgan 4 (7).

Water-pollution Research

e Department of Scientific and Industrial Research ssued, albeit somewhat tardily, the report of the r Pollution Research Board for 1948.[1] If this work s at present more closely concerned with helping stry and public undertakings than with promoting c health, it is reassuring to find that manufacturers statutory bodies are coöperating in the fight against ition.

ere is an interesting account of the re-use of sea r for cleaning shellfish—a matter of importance e mussels or other shellfish from tainted areas cleansing in water which at neap tides is deficient linity. Sea water re-oxygenated after a prescribed ment with sodium hyperchlorite and after aeration apparently be used again and again for this purpose ghout a whole season.

other object of the board's research was the nuisance ed by flies emerging from the percolating filters h treat settled sewage. Successive applications of ticide (D.D.T. and 'Gammexane'), adjusted to the population and to weather conditions, gave good lts at low cost. The quantity, however, must be fully controlled. Too much gammexane causes nding" of the filter and may diminish its efficiency. eover, gammexane, like other insecticides, is strongly c to fish if applied in excessive doses. One of the es included in the report gives details of the average city to rainbow trout of gammexane in different entrations and at different temperatures.

he board has been studying various industrial waste ers—those, for instance, resulting from the processing isal and coffee in Kenya, the washing of wheat, the ping of barley, the brewing of cider, and the "pick-" of steel. Another task was an investigation of the sey estuary to determine the effect of the discharge rude sewage on the composition and properties of mud in the navigable channels and in the big tidal n between Liverpool and Widnes. Most of the terial dredged up out of the upper estuary seemed to e been brought in from the sea rather than from the sh-water streams. The discharge of crude sewage o the estuary had no marked effect on the rate of imentation of the flocculated mud carried to and fro the tide. Lately a similar inquiry has been underken, at the request of the Mersey Docks and Harbour ard, to find the effect of discharging into the head of e estuary an alkaline sludge resulting from the manuture of sodium carbonate by the Solvay ammonia ocess at the Cheshire works of Imperial Chemical dustries. The manufacturers provided laboratory cilities and lent some of their chemists. Useful information has been obtained of the rate of deposit of Mersey ud and of its resistance to erosion, though it is too early to make any confident forecast of the ultimate effects. The department is now embarking upon a three-year examination of the causes of silting in the Thames estuary. The Port of London Authority is providing a laboratory at Tilbury and a specially fitted launch for surveys. Experiments will be made with a large-scale model of the river from Teddington to the Nore.

In enacting the River Boards Act last year, Parliament gave the big new boards the responsibility for preventing river pollution and the power to obtain information from any persons who appear to be discharging effluents into streams or inland waters. The Thames, with its special problems and authorities, was excepted from the Act. Let us hope that our legislators will somehow some day see it a salmon river again.

Obituary

SIR HERBERT EASON

A FRIEND writes: If History knows her business she will put Herbert Eason, along with Brodie, Henry Acland, and MacAlister, in the first class among the eleven presidents of the General Medical Council. Called to the chair after 15 years of service, he filled it with ever-growing acceptance by his colleagues through almost 10 years of unprecedented strain.

There are paradoxes in every interesting character, and in Eason's there were many. As a man he looked back to the past; as a president he looked, and encouraged his council to look, to the future. He did not seem to think mankind had improved since about 1750; and this outlook combined with a profound personal reticence to make it easier for him to show affection for institutions than for men. He did not abound in reverence: but he revered Guy's, the Law, and the General Medical Council.

In the chair he displayed unerring power to refer instantaneously to relevant provisions of the Medical Acts and of the standing orders; unhesitating ability to guide rather than to rule the course of business; the lawyer's aptitude for putting to a shifty witness the one deadly question; urbanity in encouraging and bringing forward junior colleagues; patience (not practised without strain) in listening to speakers who had not his gift of terseness; and control of his own command of pungent phrases throughout the public proceedings. The smooth running of every meeting over which he presided was ensured, so far as might be, by detailed rehearsal and prediction of the course of events.

In medical education, which he realised with keen historical sense to be the primary business of the council, it was his policy to leave to universities and medical corporations the freedom, guaranteed to them in 1858, to teach and examine as they would, if only they taught and examined up to a standard sufficient to make the public safe. He set his face against any attempt to undermine or circumvent that freedom by subterfuge or subtlety in drafting. It is true that he did not think the prolonged and difficult labour of the council in producing new recommendations about the minimum curriculum was best conducted in the public hearing. But he gave support, expressed with unaccustomed warmth, to the policy of enlightening anybody who might feel concerned, which the council first fully adopted in explaining their *Rules* (1945) *for Diplomas in Public Health,* and their revised *Recommendations* (1947) *as to the Medical Curriculum*, both issued during his presidency. In 1946, in search of the best that was to be had for assimilation into the new recommendations, he led a delegation of four of his younger colleagues on the council to visit medical schools in America and Canada, under the auspices of the Rockefeller Foundation —an experience he thoroughly enjoyed except for recurrent anxieties about missing trains; he was devoted to punctuality.

As spokesman of the council in exercise of discipline he sighed as a man—an autobiographical fragment reveals that he hated ordering the erasure of a name— but obeyed as an intellect. Indeed he may have given the impression, as he brilliantly maintained the right of the council to find whatever was discoverable of truth,

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[1] H.M. Stationery Office. 1949. Pp. 56. 1s. 3*d*.

Parliament

New Clauses to Amending Bill

Lord **SHEPHERD**, on behalf of the Government, has tabled the following new clauses for insertion in the National Health Service (Amendment) Bill. The committee-stage of the Bill is being taken in the House of Lords this week.

Regulations made under section 34 of the Act of 1946 and regulations made under section 35 of the Act of 1947 may confer or impose on the Medical Practices Committee or, as the case may be, the Scottish Medical Practices Committee such additional functions in relation to arrangements for the provision of general medical services as may be prescribed.

Section 38 of the Act of 1946 and section 40 of the Act of 1947 (which provide for the making of arrangements for pharmaceutical services) shall be amended by the addition at the end of each of those sections of the following subsection:

> (3) Regulations may provide for the making and recovery, in such manner as may be prescribed, of such charges, in respect of such pharmaceutical services, as may be prescribed, and the regulations may provide for the remission or repayment of the charges in the case of such persons as may be prescribed.

The powers of the Minister to make regulations under the Act of 1946 shall, notwithstanding anything in section 1 of that Act, include power to make regulations providing for the making and recovery, in such manner as may be prescribed, of such charges, in respect of such services provided under the Act of 1946, as may be prescribed, being services provided in respect of such persons not ordinarily resident in Great Britain as may be prescribed; and such regulations may provide that the charges are only to be made in such cases as may be determined in accordance with the regulations.

QUESTION TIME

War Pensioners and Medical Prescriptions

Replying to questions asking what method would be adopted to ensure that war pensioners who were receiving treatment for pensionable disability would be exempt from the charge which was to be made for medical prescriptions, Mr. H. A. **MARQUAND** said: The pensions instruments ensure free treatment—including medicines and dressings—for war pensioners for their pensioned disabilities. Disabled men have never during the last 30 years failed to receive the free treatment and they will not fail now. I shall continue to discharge this obligation. Detailed arrangements will be announced when a change has been made in the existing provisions of the National Health Service.

Treatment of Arthritis

Colonel J. R. H. **HUTCHISON** asked the Minister of Health what steps he was taking to encourage the production of the anti-arthritis discovery, 'Cortisone.'—Mr. A. **BEVAN** replied: The Medical Research Council, in touch with the Nuffield Foundation, is promoting intensive research into cortisone and other substances that might take its place and be available in adequate amounts. Various pharmaceutical firms, with whom my officers are in close contact, are also actively engaged in this field. I am prepared to render all the assistance in my power. Colonel **HUTCHISON**: While it is not desirable to raise public hopes too high in this connexion, is the Minister satisfied that there should not be any access to, or liaison with, the Mayo Clinic in America where I believe the discovery was made?

Mr. **BEVAN**: I think the hon. Member can take it for granted that all the scientific information that can be made available is made available in this field, but what we are looking for is a material out of which this substance can be cheaply and plentifully made.

Dentists and the N.H.S.

Colonel M. **STODDART-SCOTT** asked the Minister how many dentists had withdrawn from the National Health Service during the present year; how many were still withholding their service; and which townships in England and Wales had no dental treatment facilities for N.H.S. patients.—Mr. **BEVAN** replied: There were 9468 dentists on the dental lists of executive councils on Oct. 1, compared with 8914 on Jan. 1—a net increase of 554; it is believed that about 500 general dental practitioners have not joined the service; the names and addresses of dentists taking part are shown in lists available at post offices, but to get out the information in the form suggested would involve considerable tim labour, which I do not think would be justified.

Supply of Wigs

Mr. **MARQUAND**, Minister of Pensions, informed Sir E. GRA -**LITTLE** that about 7700 wigs had been provided unde National Health Service. There was no information whether any of these were supplied to foreign visitors. firms had been invited to tender for the supply of wigs. average price was considerably less than £18.

Cost of Hearing-aids

Mr. F. J. **ERROLL** asked the Minister of Health in proportions and amounts the cost of the 'Medresco' he aid, recently officially announced to [illegible] any costs of research, development. [illegible] tion, fitting, and servicing.—Mr. B [illegible] represents approximately the manufacturing cost o original aid but does not include all the costs referred the hon. Member.

Eradication of Tuberculosis in Cattle

Replying to a question Mr. **TOM WILLIAMS**, Minis Agriculture, stated that the proposed scheme for the eradi of tuberculosis in cattle on an area basis would be intro on Oct. 1, 1950.

Public Health

Typhoid at Salford

ON the morning of Monday, Nov. 7, the m officers of health of Salford learned that 3 patie surrounding townships were thought to be suffering typhoid fever. During the day the number of increased till at 4 P.M. there were 7. All these pa had eaten a meal at the Masonic Hall, Salford, on (This meal consisted of reconstituted dried celery roast beef, mashed and baked potatoes, carrots, cabbage; trifle; and coffee.

The water-supply could be reasonably excluded primary consideration because fortnightly tests i preceding months had shown no coliform orga present and a residual chlorine of 0·1 parts per 1,00 The milk-supply could similarly be excluded as i known that the dairy gave efficient heat trea and that the staff were careful operators. No sh or foodstuffs such as watercress had been consumed

Suspicion fell on the trifle, but it was found 2 of the patients with typhoid had not eaten an was soon apparent that there was no consistent co tion between the cases of typhoid and any one detailed list of foods. Attention was re-directed t staff, none of whom had admitted a history of ty fever. Until the result of Widal and culture tests known, two members of the staff on whom sus fell were suspended from duty as food-handlers drastic hygiene precautions were instituted. Subsequ a history of typhoid fever was confirmed in one of th suspended members of the staff, who was found excreting organisms of Vi-phage type E.1—the found in the outbreak.

Up to noon on Nov. 13 there were 15 confirmed of typhoid and a further 15 in which this diag though still unconfirmed, was hardly in doubt.

Infection has been proved not to be confined t meal on Oct. 6. Over 3000 people who partook of pos infected meals up to Nov. 5 were "at risk."

Smallpox

In Liverpool, a male laboratory assistant, aged 16 who handled glassware contaminated with smallpox modified by egg passage, has developed smallpox. illness started on Oct. 24, and the rash, which is dis and modified, appeared on Oct. 27. Primary vaccin had been performed on Oct. 17, 1949, soon afte began work in the laboratory. The diagnosis has confirmed by the isolation of smallpox virus pustules. The patient was isolated on Oct. 29, and tacts have been vaccinated and placed under surveill

On Nov. 10, the patient's younger brother, 15 years, who was living at the same address in Live

ISTRIBUTION OF GENERAL PRACTITIONERS

e following amendments have been made to the Medical ces Committee's classification of executive-council described in our issue of July 30 (p. 211). Other dments appeared in our issues of Aug. 20 (p. 355) and (p. 633). Schedule 1 contains the names of parts where doctors are needed; schedule 4 of the "closed areas."

Schedule 1

ADDITION

x.—Canvey Island.

DELETIONS

nshire (Lindsey).—Louth.
kshire (East Riding).—Howden, Goole.
outhshire and Newport.—Pontypool, Risca.
tingdonshire.—Ramsey.

Schedule 4

ADDITIONS

t and Canterbury.—Dover R.D.
rthenshire.—Areas immediately adjacent to Henllan and ter.

DELETIONS

kinghamshire.—Haddenham.
wall.—Bude.
setshire.—Kinson.
fordshire.—Braughing.

CORRECTIONS

olnshire (Holland).—Add Gedney Hill.
lesey.—Valley R.D. should read Valley R.D. (excluding ead Island).
efordshire.—Delete Hay-on-Wye.

CIVIL DEFENCE

March, 1948, the Civil Defence Joint Planning Staff set up under the chairmanship of Major-General S. F. ; and in December the Civil Defence Act received the l Assent. Recruitment to the new organisation began week. The four services concerned are the Civil Defence , the Auxiliary Fire Service, the National Hospital ce Reserve, and the Special Constabulary. The National ital Service Reserve is to be concentrated on the hos-; static first-aid posts will be set up only at the hospitals arby, and first-aid to casualties will be given mainly by le first-aid units based on the hospitals. For the moment eserve is open to: (1) trained nurses and midwives, led assistant nurses, and nursing assistants class 1 ing assistants in Scotland); (2) people trained, or willing trained, as nursing auxiliaries; and (3) in Scotland only, lance workers. In England and Wales the ambulance on is part of the Civil Defence Corps.

HOSPITALS' DIRECTORY

New directory,[1] prepared by the Ministry of Health, sets he areas covered by the fourteen regional hospital boards, ther with the names and addresses of the secretaries, and ames and number of beds of hospitals under each management committee, together with the name and address of the tary. Similar information is given about teaching itals. There are also lists of disclaimed hospitals, and stitutions with which regional boards have made contual arrangements. The directory concludes with an abetical list of hospitals and other institutions.

INTERNATIONAL EUROPEAN SOCIETY OF HÆMATOLOGY

E hæmolytic anæmias were the main subject of the nd International Congress of Hæmatology, held at reux on Sept. 15–17. The discussion started with a al survey by Prof. L. Heilmeyer (Freiburg), and with ar presentation of primary hæmolytic anæmia by Dr. W. shek (Boston, U.S.A.), who had observed 63 cases. This followed by more than twenty papers on hæmolytic mia and hæmolytic phenomena studied from various les by physicians, pathologists, and biologists of many ionalities. The second day's discussion concerned anti-otic and cytostatic substances. Dr. P. Dustin (Brussels) ested that mitotic poisons are more important for the hemical study of mitosis than for the control of malignant ase; and Prof. A. Haddow presented a new hypothesis cerning the mode of action of the nitrogen-mustards. L. M. Meyer (New York) said that the folic-acid agonists had not fulfilled the hopes placed in them for the atment of leukæmia. Similar experimental and clinical rvations were repeated in more than a dozen shorter munications. Various other morphological and immunological aspects of hæmatology were reviewed, and the congress ended with an emphatic plea by Prof. K. Rohr for the preservation as far as possible of the classical terminology of the blood and marrow cells. Prof. P. Chevallier (Paris), Prof. P. Lambin (Louvain), and Prof. G. Di Guglielmo (Naples) presided; and Dr. S. Moeschlin (Zurich) deserved great credit for the general arrangements. The next congress of the society will be a joint one with the International Society of Hæmatology, under the presidency of Sir Lionel Whitby, at Cambridge in August, 1950.

University of Birmingham

Prof. G. Haswell Wilson has retired from the chair of pathology. Dr. W. T. Smith has been appointed lecturer in pathology.

Royal College of Surgeons of England

At a meeting of the council on Nov. 10 with Sir Cecil Wakeley, the president, in the chair, Mr. L. C. E. Lindon, of Adelaide, was elected as a temporary member of the court of examiners.

Diplomas of membership were granted to those named in our report of the comitia of the Royal College of Physicians on Nov. 5 (p. 867).

Royal Faculty of Physicians and Surgeons of Glasgow

Dr. A. L. Goodall will open the celebration of the 350th anniversary of the foundation of the faculty on Wednesday, Nov. 23, at 5 P.M., when he delivers the Finlayson lecture on its history. On Nov. 25 the lord provost and corporation of Glasgow will receive the president (Dr. W. R. Snodgrass) and fellows of the faculty, and on Nov. 27 at 10.30 A.M. there will be a special service at Glasgow Cathedral. On Nov. 28, at a reception in the hall of the faculty, the honorary fellowship will be conferred on Prof. E. P. Cathcart, M.D., F.R.S., Sir Hector Hetherington, LL.D., Prof. G. B. Fleming, F.R.C.P., Prof. Hilda Lloyd, F.R.C.O.G., Lord Moran, P.R.C.P., Mr. R. B. Ness, F.R.F.P.S., Dr. W. D. D. Small, P.R.C.P.E., Sir Cecil Wakeley, P.R.C.S., and Mr. W. Quarry Wood, P.R.C.S.E. On Nov. 29 the faculty is giving a commemoration dinner.

Faculty of Ophthalmologists

Some confusion has arisen as a result of two apparently conflicting decisions of the council of this faculty concerning the period of postgraduate training and experience recommended before qualifying as a consultant. In 1946 the three Royal Colleges, having considered the advice of other bodies including the faculty, drew up a list of criteria and agreed on a minimum of five years. Early this year, on a further request from the Joint Committee for Consultants through the Royal College of Surgeons, the council of the faculty gave its opinion that ten years was the necessary period. This was done before it was known that there would not be a division between specialists and consultants. When it was discovered that there would be no division, the decision was rescinded and the original view of five years was confirmed.

Association of Industrial Medical Officers

Dr. L. G. Norman, chief medical officer of the London Transport Executive, has been elected president of this association.

Royal Society

A Royal medal has been awarded to Prof. R. A. Peters, M.D., F.R.S., for his researches on the biochemical rôle of vitamin B_1 in tissue metabolism, and the mechanism of the toxic action of lewisite and other arsenical compounds.

International Control of Morphine Substitutes

A United Nations agreement to place the synthetic morphine substitutes under international control is expected to come into operation early next year. According to B.U.P., the last of the 25 signatures needed to make the agreement effective is expected shortly.

Pavlov Centenary Celebrations

In connexion with this centenary the film *Mechanism of the Brain* will be shown at Guy's Hospital Medical School, London, S.E.1, on Monday, Nov. 28, at 5 P.M. *Academician Pavlov*, which was lately reviewed in THE LANCET (Oct. 29, p. 821) will be shown at the Hammer Theatre, Wardour Street, W.1, on Thursday, Dec. 8, at 7.45 P.M. Tickets may be had from the Society for Cultural Relations with the U.S.S.R., 14, Kensington Square, W.8.

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[1] Hospitals' Directory: England and Wales. H. M. Stationery Office. Pp. 164. 3s.

HE DIAGNOSIS OF BONE TUMOURS *

JAMES F. BRAILSFORD
M.D., Ph.D. Birm., F.R.C.P., F.I.C.S.
LTING RADIOLOGIST AND DIRECTOR OF RADIOLOGICAL
DIES IN LIVING ANATOMY, UNIVERSITY OF BIRMINGHAM

> "They that have power to hurt and will do none,
> That do not do the things they most do show,
> Who, moving others, are themselves as stone,
> Unmovéd, cold, and to temptation slow;
> They rightly do inherit Heaven's graces,
> And husband Nature's riches from expense;
> They are the lords and owners of their faces,
> Others, but stewards of their excellence."
>
> *Sonnets*, W. SHAKESPEARE.

HEN the diagnosis of bone tumours depended solely he clinical evidence, limbs were sometimes amputated gh the lesion was benign and would have resolved r efficient treatment. There were no early diagnoses probably no cures.

cause of this and because pathologists had shown dvantages of histopathological examinations in soft-e lesions, it became customary to seek early diagnosis one tumours by biopsy. This practice, however, ys carries important risks, and I believe these should nger be taken now that radiological aids to diagnosis an alternative.

the same time it is clear that radiography can be gravely misused. There has been a tendency ach that radiology is a short cut to diagnosis, which ers preliminary clinical investigation unnecessary even undesirable—that progressive disease is asymp-tic and its detection in the early stages only possible adiography. This in turn has focused attention on radiographic appearances rather than the patient's lition; indeed it has led to treatment of the radio-hic appearances, and sometimes gross neglect of the se. Such erroneous teaching indicates ignorance portant radiographic periods:

The *latent negative radiographic period*—the period between the date of trauma, or the onset of clinical signs and symptoms, and the first appearance of abnor-mality on the X-ray film. (In some cases the clinical signs and symptoms begin to fade before the radiographic signs develop, for there is a lag in the radiographic evidence of resolution as well as of progression.)

The *positive radiographic symptomless period*—the period during which radiography continues to show signs of a lesion, though resolution or complete healing has taken place and the patient is free from symptoms. This period often endures for the remainder of the patient's life.

ertain circumstances the first of these two periods rlaps the second: the radiographic signs of an ve illness have not yet appeared, while those of a ner illness are still conspicuous.

o ignore the clinical evidence and treat the patient rding to the radiographic findings may have serious sequences, and radiography, therefore, should never cede or supplant adequate investigation. The fact ains that the diagnosis of tumours of bone from clinical signs and symptoms alone is almost impossible.

RISKS OF BIOPSY

If biopsy could be proved to result in a prompt curate diagnosis, the risks it involves might be worth king. But in bone lesions it has very serious limitations, d is liable to important erroneous interpretations.

1. Biopsy necessitates an anæsthetic. Though this ay appear of little significance, it is well to remember at some patients die during the exploration of lesions und afterwards to be benign—indeed, by a trick of fate, the exploration of an inoperable carcinoma seems to carry less risk.

2. Biopsy necessitates cutting into the lesion. It is contested that this does not spread malignant cells, but we are all familiar with the dispersal of infective organisms by such surgery: the cutting into a tuberculous focus has been responsible for the subsequent development of tuberculous meningitis. In any condition where the clinical and radiographic features determine the need for resection we should avoid making any unnecessary incision into the lesion. Comparison of radiographic appearances before and after biopsy shows that the surgical incision does disperse malignant cells locally, if not generally; before biopsy we see the disease confined to the bone, but after the cortex of the bone has been cut into we see an irregular periosteal reaction, spicules, and abnormal soft tissue tumours—a sort of explosive effect.

3. Biopsy adds the reactions of trauma to those of the disease. These affect not only the histological features of the lesion but also the serial radiographic appearances which may become much harder to evaluate. It interferes with the normal sequence of changes in bone lesions, which, left undisturbed, may be characteristic and permit of accurate diagnosis.

4. Biopsy removes bony scaffolding which may seriously interfere with the resolution and stability of the affected bone—particularly when it is a "real biopsy" in which an extensive survey of the exposed lesion is made and several pieces of tissue, sometimes of good size, are removed. Needle biopsy is acknowledged, even by the enthusiasts for biopsy, to be of little use for bone lesions.

5. Biopsy does not always provide material on which a reliable opinion can be formed. The material removed may be from bone away from the influence of the pathological process (e.g., normal bone), from bone showing only the reactive changes surrounding the lesion, or from a degenerative part of the lesion. But even when the whole lesion is submitted for histopathological examination to a number of eminent pathologists, we may receive as variable a number of verdicts, ranging from benign to highly malignant. Particularly in the presence of some deficiency, osseous dystrophy, or dysplasia, the histological responses of bone to trauma, inflammation, and neoplastic change may be apparently indistinguishable; and the result of biopsy is that some malignant processes escape detection while some benign lesions are given the significance of malignancy. In any case, the tissue removed represents but a part of the bone at the time of its removal, and from it the pathologist may not be able to estimate its age, assess the essential nature of the change or origin, or determine the rate of growth of the cellular structure. If the lesion has been subjected to any extraneous influence such as trauma, X radiation, or influential medication, the histological findings may be changed accordingly: the extent of the influence of these factors may be impossible to estimate. Too often the pathologist is blamed when it is the material supplied which is responsible for the difficulties. The unreliability of the procedure has never been better demonstrated than in a case where an osteopathologist's biopsy diagnosis of chondrosarcoma had later to be changed to benign ossifying hæmatoma—because the patient was considered unfit for amputation and his lesion had a chance to resolve. The comment made was: "had the limb been amputated in this case no one could have proved that this was not a sarcoma cured by amputation" (Baker 1946)—an admission of the highest significance when evaluating the reliability of biopsy.

6. Biopsy may actually be the cause of delay in surgical treatment. This happens more often than is supposed.

Based on an address delivered at many of the chief medical centres in the United States of America, 1948–49.

London County Medical Society

A clinical meeting of this society will be held at Boxley Hospital, Boxley, Kent, on Wednesday, Dec. 7, at 3 P.M.

General Medical Council

Dr. O. C. Carter has been elected to the council as a direct representative for England for the five years from Nov. 8, 1949. The voting was as follows:

OCTAVIUS CYRIL CARTER, M.B.	12,603
LEON GILLIS, M.B.E., M.CH.ORTH., F.R.C.S. ..	2507
WILLIAM ALEXANDER BRYCE, M.B.	2329

Aureomycin and Chloromycetin Centres

The regional hospital board centres for the distribution of aureomycin and chloromycetin are as follows:

Region	*Distribution Centre*	*Tel. no.*
Newcastle	Newcastle-on-Tyne General Hospital, 418, Westgate Road, Newcastle, 4.	Chief Pharmacist New. 35211
Leeds	Leeds Blood Transfusion Laboratory, The Bridle Path, York Road, Seacroft, Leeds.	Leeds 45091
Sheffield	Ci	Nottingham 66292
East Anglian	Ac Cambridge.	Chief Pharmacist Cam. 1451
North West Metropolitan	West Middlesex Hospital, Twickenham Road, Isleworth.	Chief Pharmacist Hounslow 2311
North East Metropolitan	Mile End Hospital, Bancroft Road, E.1.	Physician Supt. Advance 2873
South East Metropolitan	Grove Park Hospital, Lee, S.E.12.	Lee Green 1077
South West Metropolitan	South London Blood Supply Depot, Benhill Avenue, Sutton, Surrey.	Vigilant 0068
Oxford	Unit Ch	Chief Pharmacist Oxford 48651
South-Western	Ham Hc Bristol.	Bristol 31165
Wales	City Isolation Hospital, Canton, Cardiff.	Med. Supt. Cardiff 960
Birmingham	Selly Oak Hospital, Birmingham.	Med. Supt. Selly Oak 1361
Manchester	Royal Infirmary, Manchester, 13.	Chief Pharmacist Ardwick 3300
Liverpool	Fazakerley Sanatorium, Liverpool, 9.	Med. Supt. Aintree 2321

Liverpool Regional Hospital Board

The probable expenditure of the board on Capital Account for 1949–50 is estimated at £309,801 as against the maximum of £334,000 approved by the Ministry of Health. The under-spending has been occasioned by delays in the commencement of schemes. For 1950–51 two lists are submitted at the Ministry's request, the first totalling £334,000 (i.e., the same as permitted for 1949–50), and the second totalling £167,000 or half this figure. Works in the second category will be undertaken only if the national finances permit. Provisional lists of schemes have also been submitted at the Ministry's request amounting to £668,000 for 1951–52 and £1,002,000 for 1952–53.

The net requirements for the whole of the region for the current year are estimated at £7,658,688, which is £535,384 or 7·5% in excess of the approved figure. Seventeen of the nineteen hospital management committees show increases, £478,958 of which is attributable to salaries and wages. About £111,000 of the latter figure (offset by £26,000 income) is represented by national pay awards to various types of nurses, but the remainder is due to the employment of increased staffs, particularly nurses. The corresponding estimate for 1950–51 is £8,694,864, which is £1,571,560 or 22·1% in excess of this year's approved figure. Provision has been made for the occupation of 1173 additional beds above this year's figure, and about £425,000 may be ascribed to this cause. The remainder of the increase is largely attributable to improvement of standards, particularly in nursing strengths, and development of ancillary services. Provision is sought for the engagement of an additional 1890 employees, of whom 1289 are nurses. The total increase in the salaries and wages bill is £959,963 gross, less certain charges for board-residence. Repairs and maintenance of plant and premises show an increase of £202,842, largely because of the cuts made under this heading for the current year which cannot be repeated. Provisions show an increase of £129,461. In making the estimates no allowance has been made for any general rise in the price level as the result of devaluation except to a very limited extent for the price of bread and flour confectionery.

U.S. Army's Plan to Conserve Doctors

Under a plan adopted by the United States Army view to securing economy in professional staff in hospital personnel will be divided into two trative and professional. The professional group, of doctors, dentists, nurses, and others, will not be to join the unit until this is engaged in the actual care patients; and when the need for this group ceases they be transferred elsewhere while the administrative remains to supervise the moving of equipment and By this plan, out of 47 professional people required for type of field hospital, only 4 will be needed for constant with the unit. All field hospitals will eventually be orga according to this plan.

Prof. T. Pomfret Kilner has left for Turkey where he give a series of lectures sponsored by the British Council the Turkish ministry of health.

CORRIGENDUM.—*The Lymphocyte and Defence Mechan* In the leading article of Nov. 12 (p. 899) under referen add Dougherty, T. F., White, A. *J. Lab. clin. Med.* **32**, 584. This paper gives a full summary of their wor

Diary of the Week

NOV. 20 TO 26

Monday, 21st

UNIVERSITY OF LONDON
6 P.M. (London School of Hygiene, Keppel Street, W.C. Sir James Learmonth: Contribution of Surgery to ventive Medicine. (First of four Heath Clark lectur

HUNTERIAN SOCIETY
8.30 P.M. (Apothecaries' Hall, Black Friars Lane, E.C.4.) J. Y. Dent, Dr. Desmond Curran, Dr. Henry Yellow Mr. Archibald Crawford, K.C.: That Alcohol has Co buted More to the Happiness than to the Mis Mankind.

Tuesday, 22nd

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East,
5 P.M. Prof. N. B. Capon: Development and Behavio Childhood. (Charles West lecture.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. James Craigie, F.R.S.: A Quantitative Appr to the Study of Transplantable Tumours (Imp Cancer Research Fund lecture.)

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. I. Muende; Histopathology of the Skin.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Postgraduate Medical School of London, Ducane Rd W.12.) Dr. Mary Gilmour: Radiotherapy in malignant Uterine Hæmorrhage.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
5 P.M. (University New Buildings, Teviot Place.) Dr. T. Hunt: Pancreatitis.

Wednesday, 23rd

ROYAL COLLEGE OF SURGEONS
5 P.M. Sir Henry Wade: The Barber Surgeons of Edinbu (Thomas Vicary lecture.)

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, S.E.5
4.30 P.M. Dr. E. Stengel: Lecture-demonstration.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Port Place, W.1
3.30 P.M. Dr. W. Blood: Mechanisation in its Relation to Public Health.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. Vin Street, Glasgow
5 P.M. Dr. Archibald Goodall: The Royal Faculty of Phy and Surgeons. (Finlayson lecture.)

Thursday, 24th

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Desmond Curran: Psychiatry lecture demonstration.

KING'S COLLEGE OF HOUSEHOLD AND SOCIAL SCIENCE, Camp Hill Road, W.8
5.30 P.M. Prof. John Yudkin: Food and Mankind.

MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Dr. W. Lindesay Ne statter: Psychiatry and the Defence.

UNIVERSITY OF LIVERPOOL
4 P.M. (Medical school.) Prof. S. L. Baker: Basic Reac of Bone Tissue. (Lady Jones lecture.)

HONYMAN GILLESPIE LECTURE
5 P.M. (Edinburgh University New Buildings.) Dr. Jam Laurie: Pleurisy.

Friday, 25th

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9
5 P.M. Dr. P. H. Sandifer: Clinical demonstration.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES
8 P.M. (11, Chandos Street, W.1.) Prof. Arnold Sorsby: Ocu Aspects of the Venereal Diseases.

HE DIAGNOSIS OF BONE TUMOURS *

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6. Biopsy may actually be the cause of delay in surgical treatment. This happens more often than is supposed.

Based on an address delivered at many of the chief medical centres in the United States of America, 1948–49.

In one case I recorded, the diagnosis of osteogenic sarcoma was made from the characteristic radiographic features, but there was seven months' delay in amputation because of failure to obtain histological evidence of tumour or malignancy, despite exploratory biopsy and resection of the large abnormal bony mass as completely as possible. *The idea prevails that biopsy facilitates early diagnosis, and early diagnosis permits of precipitate amputation*; yet this patient was subjected to three unnecessary exploratory operations in the seven months' interval between the radiological diagnosis and the belated amputation.

THE SURGEON'S RESPONSIBILITY

In view of the foregoing risks I would *suggest that*, before doing any biopsy, the surgeon should *(a)* undertake to act on the pathologist's findings, *and (b)* plan the operation he would consider necessary if malignant *disease is reported*, and *(c)* obtain the necessary permission *of the patient* or relatives.

If he is going to quibble over the pathologist's report, even to the extent of sending the preparations to other pathologists *for opinions*, or if the patient or relatives are going to deny him *permission* to do what he thinks essential, he ought not to do the biopsy *at all*; *for it will be useless and will inflict* unnecessary mental and physical pain without conferring the slightest benefit on the patient. Sometimes, after receiving *a biopsy report* that a lesion was malignant, surgeons have *attempted* a local removal, either because they hoped it *might* be successful or because they did not wish to bear the responsibility *of* mutilating the patient. But if a lesion, clinically *and* radiographically, appears to be localised *would it not be better to do a localised resection in the first instance, instead of having a first operation to cut a bit out and then have to face the risks and anxieties of a second?* The resected lesion can then be sent entire to the pathologist, who will have a better chance to study its character. Whatever the pathologist's report, the surgeon has the satisfaction of knowing that his surgery was designed to remove the entire lesion without dispersing the pathological tissue. The patient is better off than he would have been after a biopsy, for the surgeon has now the choice of waiting and watching the subsequent development, or of amputating the limb if he considers that necessary, and he has the patient's consent.

Many lesions resected in this manner, though reported as malignant from the histological characters, have proved to be benign and the patient has suffered no further disturbance. There have also been cases where the patient has died of metastases, though his lesion was *reported as histologically benign*.

If any surgical intervention is to be undertaken, the surgeon should ask for *radiological localisation and skin markings*; *for the position of a lesion in a bone relative to the skin can be very confusing and a skin localisation* saves time and assists efficiency.

RADIOGRAPHY OF BONE TUMOURS

Our knowledge of the radiographic appearances of many bone lesions has been built up from continuous studies of their course to destruction or resolution, aided by the pathologist's contributions on isolated cases. As I have shown elsewhere (Brailsford 1948a), many bone diseases and tumours have characteristic radiographic appearances which allow of ready identification. On the other hand I am well aware that different kinds of lesions may have radiographic features which are indistinguishable from one another; and that is why I disapprove of the practice of encouraging students to make a "spot" diagnosis from one film. Sometimes the development of a lesion must be watched clinically and *radiographically*, over a period depending on its of change, before coming to any conclusion. To *who crave early diagnosis* this appears as pr *and they blame it for contributing to the high mortality from osteogenic sarcoma*; but I have myself that the earliest diagnosis of this prompt amputation does not ensure cure.

Indeed, I have set out to detect evidence of osteog sarcoma at the earliest possible moment (sometimes the first visit of a patient whose symptoms or si have been present but a few weeks, as was suppor by the nature and extent of the radiographic chang and get amputation quickly; yet in no such case the patient survived—death has occurred within years with metastases. In some cases metastases ca demonstrated in the lungs on the first visit of a pa complaining of a localised lesion of recent origin, it is the experience of most surgeons who have d with a number of cases of osteogenic sarcoma t metastases and death follow prompt amputation

But if precipitate or prompt amputation does ensure cure, it may certainly involve the loss of a for a benign lesion, which, left untouched, would resolved. Such an accident indicates undue haste, insufficient and sometimes inefficient clinical and ra graphic observation. It is said that by watching waiting for the diagnosis to be established clinically radiographically, you jeopardise the patient's chances cure if the lesion should turn out to be malignan but I nevertheless believe the delay to be justifia In my experience, when the clinical and radiograp evidence was inconclusive, the histology was equ confusing. No-one can prove that the delay resulte the patient's death. MacDonald (1949) recently st that figures from the Registry of Bone Sarcoma sho "that more of the cured than the fatal cases had bio done one day to five years before amputation." O *workers have said that patients who sustained than one biopsy lived longer than those who had* or but one. I cannot understand such reasoning. patient with a lesion which clinically and radiographic was an osteogenic sarcoma would not have needed biopsy; certainly not more than one. Do not mult biopsies mean indecision and inconclusive evidence? my experience biopsy has hastened, rather than reta *the development of osteogenic sarcoma.* The esse claim made for biopsy is that it permits of early diagn but actually it may confuse and seriously delay recognition of malignant disease (Brailsford 1948b).

My thesis is that careful clinical examination radiography by experienced workers will enable th to give an early and accurate diagnosis without cau the patient any pain and without the consequence surgical trauma. Sometimes the radiographic evid is conclusive at the first examination. In other c first radiographs in themselves do not permit of a def *diagnosis, but in the light of the clinical history* t may be very *suggestive.* For instance, where the his is of a definite trauma and the radiographs show cha which could have been produced by that trauma, it very unlikely that malignant metaplasia has occur in the tissues; for trauma as the immediate cause sarcoma is very very rare. I am fully conscious of t fact that, in many cases of sarcoma, the history trauma is given; but it is usually possible to see fr the radiographic appearances that the trauma me drew attention to a pre-existing lesion. That sarc can arise at the site of an old injury, or within a fo of disturbed ossification (e.g., in the dysplasias of bo I have much evidence to prove. But if the trau is recent the probability is that it has initiated inflammatory focus and that suitable *immobilisatio* and chemotherapy will soon confirm this without an rt to surgery. Too often is the diagnosis of Ewing's ōma made of a syphilitic or other inflammatory s in bone because of certain ill-understood radio- hic features, perhaps supplemented by histological nination of material removed at biopsy. Before hing such a diagnosis it is particularly important xclude all possibilities of an inflammatory focus, ı to the extent of administering appropriate medica- , for the reports on serum reactions cannot always elied on, and the only other alternative—amputation deep X-ray therapy—are no cures for a Ewing's oma or syphilis.

is important to remember that the presence of a plasia of bone does not confer immunity to trauma, iency, endocrine, inflammatory or neoplastic com- ations; and in some cases only a double diagnosis explain the unusual clinical and radiographic features the confusion in the histopathology. The possibility ı localised destructive process in a bone being a astasis from a carcinoma must always be considered, the response of such a lesion to a reasonable dose of ays may well be worth seeking—especially as the m which will respond to such radiation will not ire the dosage to be pushed to skin tolerance.

mong the many radiographic features which often to distinguish the nature of lesions in young people he integrity of the growth cartilage. The malignant wth is often limited in its extension by this, though adjacent diaphysis or epiphysis may be seen to be lly infiltrated. The most common transgressor ugh the growth cartilage, even in the early stages lesion, is the tubercle bacillus—a fact which is often reat diagnostic help.

hough from a study of many cases the gross histo- ical features can be suggested, it is not usually possible the radiologist to offer a histological diagnosis. He contributed his maximum for the good of his patient n he has reported to his colleagues that the lesion enign or malignant: the enumeration of conditions, ed on histological features, which it might be, is s-work, and of little value to his surgical colleagues. it is histological features which the latter seeks, he obtain them from a more reliable source.

n the past the responsibility for the diagnosis has n passed to the pathologist. I believe that surgeon, hologist, and radiologist all have their responsibility l only by a full recognition of that responsibility the patient receive the best treatment.

SUMMARY

n the diagnosis of bone tumours, biopsy has serious itations and risks. On a mistaken interpretation, a limb y be amputated for a lesion which would have resolved eft undisturbed.

Usually a local resection of the entire lesion is preferable biopsy.

Certainly no surgeon should undertake biopsy unless is prepared to accept the pathologist's findings and eady has the patient's consent to the operation these tate.

The best and safest means of arriving at an accurate agnosis is clinical observation, aided by serial radio- aphic studies.

Though this observation may involve some delay, ere is little reason to suppose that more immediate eatment would improve the patient's chances of rvival if his lesion is malignant. If his lesion is not alignant, an accurate diagnosis may save his limb.

REFERENCES

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CHLOROMYCETIN IN THE TREATMENT OF TYPHOID FEVER

FOURTEEN CASES TREATED IN THE MIDDLE EAST

A. T. COOK
M.B. Lond.
CAPTAIN, R.A.M.C.

D. E. MARMION
M.A., M.B. Camb., M.R.C.P.
MAJOR, R.A.M.C., MEDICAL SPECIALIST

THE accidental discovery by Smadel et al. (1948) that 'Chloromycetin' was effective in the treatment of typhoid fever was confirmed by Woodward et al. (1948), and a small number of favourable reports have since been published in the United Kingdom (Bradley 1949, Murgatroyd 1949). A limited amount of the drug was made available for use in British military hospitals in the Middle East Land Forces. We here describe the results obtained in the British Military Hospital, Fayid, in a small series of cases from the Suez Canal Zone of Egypt.

CLINICAL MATERIAL AND SELECTION OF CASES

Typhoid and paratyphoid fevers are endemic in Egypt, and tend to occur sporadically and in small outbreaks of three or four cases among military and Royal Air Force personnel and families. The 25 cases recorded here were seen between February and September, 1949. All the patients had been protected by T.A.B. inoculation, though 3 had not had booster doses within the preceding twelve months.

The original intention was to carry out a controlled trial. However, the untreated control (case 2) of the first case treated with the drug became so desperately ill that it was deemed unjustifiable to withhold chloromycetin, and there is little doubt that it saved his life. After this it was decided to give the drug only to the most severe cases.

Future severity is difficult to assess in the early stages of typhoid, but experience showed that (1) a high maintained fever, (2) severe toxæmia with delirium, prostration, and repeated vomiting, and (3) the occurrence of complications, augured unusual severity when present in the early stages of the illness; in any event such cases run a long course, imposing a heavy strain on their resources, resulting in great debility and prolonged convalescence. This was the basis of selection for chloromycetin therapy.

Salmonella typhi was isolated from the blood in all cases except no. 9 in which it was grown from the fæces, and no. 14 in which the diagnosis was confirmed by agglutination reactions. This last case was treated at a civil hospital under the supervision of Lieut.-Colonel A. P. Trimble, R.A.M.C.

Of the 25 cases, 14 were treated with chloromycetin, and of these 3 had relapses which were similarly treated. In addition we treated 1 case each of paratyphoid A and B fevers, with results identical with those obtained in typhoid. In 11 cases chloromycetin was not given. The 2 most severe of these (nos. 15 and 16) occurred before we had the drug: one died of a perforation after a very stormy course, while the other relapsed ten weeks after becoming afebrile, but eventually recovered.

DOSAGE AND ADMINISTRATION OF CHLOROMYCETIN

Chloromycetin (Parke Davis & Co.) (chloramphenicol) was dispensed in capsules containing 0·25 g. for oral administration. Each course started with a dose of approximately 50 mg. per kg. body-weight (10–14 capsules). Vomiting, delirium, and lack of coöperation often made it difficult to administer this large dose, and it would have been an advantage to have a preparation for parenteral injection. In one case it was necessary to pass a Ryle's tube and inject an aqueous suspension of the drug into the stomach. After the initial dose

Case no.	Age and sex	Day of illness admitted to hospital	Length of illness (days)	Chloromycetin (g.)	Severity of fever (F) and toxæmia (T)	Main symptoms and signs								Relapse (day of commencement)	Blood or fæces culture and day of 1st +ve.	Other symptoms, signs, complications, and general remarks
						Headache	Delirium	Vomiting	Diarrhœa or constipation	Meteorism	Incontinence	Spleen	Exanthem			
1	26 M	4	20	22	F: + + T: + + + +	+ +	+ +	+	D + +	0	+ +	0	+ +	..	BC 14	Dysenteric onset. See case-hi
2	20 M	10	30	22	F: + + + T: + + + +	+ +	+	+	C→D	0	+	0	+ + + +	..	BC 10	Muscular pains; hæmorrh bronchopneumonia, transf rigors, neuritis. See case-hi
3	20 M	3	10	20	F: + + T: + +	+	0	0	C	0	0	0	+	22	BC 5	
		REL	8	21	F: + + T: + +	+	0	0	D	0	0	0	+	..	BC 24	Small hæmorrhage at onset relapse
4	19 M	4	13	22	F: + + T: + + +	+	(+)	+	C	+	(+)	0	+	..	BC 16	..
5	21 M	3	12	22	F: + + + T: + + + +	+	+	+ + +	C	+ +	+	0	+	35	BC 5	See case-history
		REL	8	20	F: + + T: + +	+	0	+	C	+	0	0	0	..	BC 38	
6	38 M	18	25	22	F: + + T: + + +	+ + +	0	(+)	C	0	0	0	+	..	BC 18	Mental irritability and negati See case-history
7	20 M	2	16	21	F: + + T: + + +	+	+ +	+	C	0	+	0	+	..	BC 11	..
8	19 M	4	15	21	F: + + + T: + +	+	0	0	C	0	0	0	+	..	BC 8	..
9	35 F	11	15	21	F: + + T: + +	(+)	0	+	0	0	0	+	+	..	FC 11	Muscular pains
10	26 F	2	12	20	F: + + + + T: + +	+	+	+	C	+	0	0	+	31	BC 4	See case-history
		REL	8	20	F: + + + + T: + + + +	+ + +	+	+ +	C	+ +	0	0	+ +	..	BC 32	Confluent bronchopneumo severe prostration
11	19 M	2	26	20	F: + + T: + +	+	0	0	0	0	0	+	+	..	BC 9	..
12	21 M	4	16	21	F: + + + + T: + +	+ +	0	+	C	0	0	+	+	..	BC 8	Backache. See case-history
13	19 M	3	15	21	F: + + T: + + +	+ +	0	0	D	0	0	0	+	..	BC 8	..
14	39 F	19	37	21	F: + + + + T: + + + +	+ +	+ + +	+	C	+ +	+	0	0	..	Agglut. reactions	In another hospital. Fever sub by crisis two days after chl mycetin commenced; supp moribund
15	19 M	3	27	..	F: + + T: + + + +	+ +	+ +	+ +	C	+ + +	+ +	0	0	..	BC 5	Chloromycetin not available. foration about 22nd day, de 27th. Post mortem: ge peritonitis
16	20 M	7	37	..	F: + + + T: + + +	+ + +	+	0	C	+	0	0	+ +	115	BC 13	Severe muscle pains and int spinal rigidity, especially at of relapse, when it was his important symptom. C spinal fluid normal. Submand lar adenitis in convalescence
		REL	22	..	F: + + T: + +	(+)	0	0	C	0	0	0	0	..	BC122	
17	24 M	15	25	..	F: + + T: +	+	0	0	C	0	0	0	0	..	BC 23	..
18	19 M	1	19	..	F: + + T: +	+	0	+	0	+	0	+	+	..	BC 7	Muscle pains
19	19 M	8	29	..	F: + + + + T: + +	+	(+)	+	C	+	0	0	+	..	BC 11	..
20	19 M	21	?	..	F: (+) T: +	+	0	0	D	0	0	0	0	..	BC 35	Abdominal colic. Low fever 99°F persisting till after di-ch from hospital
21	20 M	23	33	..	F: + + T: + +	+ +	+	+	C	+	+	0	+ +	..	BC 6	..
22	22 M	4	7	..	F: (+) T: (+)	+	0	0	0	0	0	0	0	..	BC 4	Very mild and short attack
23	19 M	6	25	..	F: + + T: +	+	0	0	0	0	0	+	+ +	..	BC 9	..
24	36 F	9	29	..	F: + + T: +	+	0	0	C	0	0	0	+	..	BC 11	..
25	20 M	2	33	..	F: + + T: + +	+	+	+	0	0	0	0	+	..	BC 5	..

Most of the terms and symbols used are self-explanatory. "Length of illness" refers to the time from the onset of symptom the last day of fever.

The symbol (+) is used where the symptom, &c., was present but to an insignificant extent: + = mild, + + = moderate, + + + = sev + + + + = very severe.

capsule was given every two hours until the tem- ture fell to normal, and thereafter every four hours mplete the course of 20–22 g., varying according to size of the patient and the response to treatment. verage course took nine days.

eneral treatment followed accepted lines. Patients nursed in air-conditioned wards at a temperature 0–80°F (the day temperature outside often being over 100°F), and small frequent feeds were given of gh-calorie, low-residue bland diet with adequate rals, vitamins, and fluids. When there was respira- infection of more than trivial degree, penicillin was 1; but it was not observed to make any difference e the typhoid infection remained active.

l treated cases were kept in bed for 14 days or more the fever had subsided, and by this time all but most severe had become very active in bed (in ked contrast to untreated cases). Exercises and sage were started in all cases within a week of rvescence.

CASE-HISTORIES

he main features of all 25 cases are summarised in accompanying table. We do not regard the untreated s as controls, but it is nevertheless instructive to pare the two groups.

bbreviated clinical charts of the following cases are n in fig. 1.

ase 1.—*A severe case with dysenteric onset.* Male, aged 26, oral, R.A.F. He had been admitted to another hospital 4 days' history of bloody diarrhœa; this was unsuccess- treated with sulphonamides, and no pathogenic organisms found in the stools. He became steadily worse, more and dehydrated, and was transferred to our hospital he 14th day of illness as a case of "clinical enteric." admission he was very ill, emaciated, confused, and ly incontinent; he had severe pea-soup diarrhœa, and ores. *S. typhi* was grown on blood-culture. Chloro- etin treatment began on the 17th day of illness, and he afebrile 4 days later, though he did not recover sphincter rol till the 28th day. By the 33rd day he was mentally e normal, eating heartily, and gaining weight. He started t up on the 46th day, and was discharged to convalescent t on the 75th day.

ase 2.—*A very severely toxic case with intestinal hæmorrhage.* e, aged 20; aircraftman, R.A.F., admitted to hospital r a collapse at work, with several weeks' history ague ill health and headaches, and 10 days' muscular s and sweating (taken to indicate the onset of the illness). general condition was good, and there were no physical s except fever. *S. typhi* was grown from the blood. the 16th day of illness he developed a confluent rash on k and limbs, and deteriorated steadily thenceforward l on the 25th day he had pea-soup diarrhœa and was tional and incontinent. Though he was a "control" it was deemed unjustifiable to withhold chloromycetin longer, and on the 27th day administration was started. he next 48 hours he had gross intestinal hæmorrhage ut 4 pints in all); a continuous intravenous glucose- e drip was instituted, and he also received 4 pints of d, the latter causing severe rigors. He developed con- lation at both lung bases, and the outlook was considered less. On the 30th day, after a rigor, he was thought e dying, but he rallied in two or three hours, and improve- t began from that time. He was very weak and remained ntinent until the 50th day; he was also found to have kness of his left anterior tibial muscles (probably due to ritis). He started to get up on the 70th day, and was alided to the U.K. on the 93rd day, fully ambulant and ning weight and strength but having tachycardia on rtion.

Case 5.—*A severe case with a relatively mild relapse.* Male, d 21; aircraftman, R.A.F., admitted with 4 days' history nausea, constipation, and headache. There were no physical ns except fever: *S. typhi* was grown on blood-culture. He came rapidly worse with incontinence, profuse vomiting, d delirium. Chloromycetin was commenced on the 7th day; started to improve 2 days later, was afebrile on the 12th y and mentally normal on the 13th. Progress was unevent- l until the 35th day when he had evening fever, and for the next 3 days his temperature mounted steadily. *S. typhi* were grown on blood-culture on the 38th day, and chloromycetin was recommenced on the 40th. He had moderate meteorism and vomiting. Temperature was normal on the 43rd day, and convalescence was thereafter uneventful; he got up on the 61st day and was discharged to convalescent depot on the 82nd.

Case 6.—*A typical case of moderate severity with a long prodromal period.* Male, aged 38; major, R.A.S.C. 18 days before admission he had a few days' fever and headache, which improved, and then became much worse 3 days before admission. There were no physical signs except fever: *S. typhi* were grown on blood-culture. He rapidly became worse, and was mentally irritable and negativistic. Chloromycetin was begun on the 21st day, and his headache and mental condition improved 2 days later. He was afebrile on the 25th day, and free from symptoms. Further convalescence was uneventful: he got up on the 40th day and was discharged to convalescent depot on the 59th.

Case 10.—*A severe case treated early, with a very severe relapse complicated by bronchopneumonia.* Female, aged 26; aircraftwoman, W.R.A.F. Admitted from another hospital with 8 days' history of headache and fever; *S. typhi* had been grown from the blood on the 4th day. She had a tumid abdomen with rose spots and a palpable spleen. She became more ill, with vomiting and delirium, and chloromycetin was commenced on the 10th day. She started to improve 2 days later, was afebrile the next day, and thereafter appeared to progress satisfactorily. On the 24th day she complained of retrosternal pain and was very miserable, and for the next few days her evening temperature was about 99°F. From the 31st day the fever increased rapidly, and on the 32nd day *S. typhi* were grown on blood-culture.

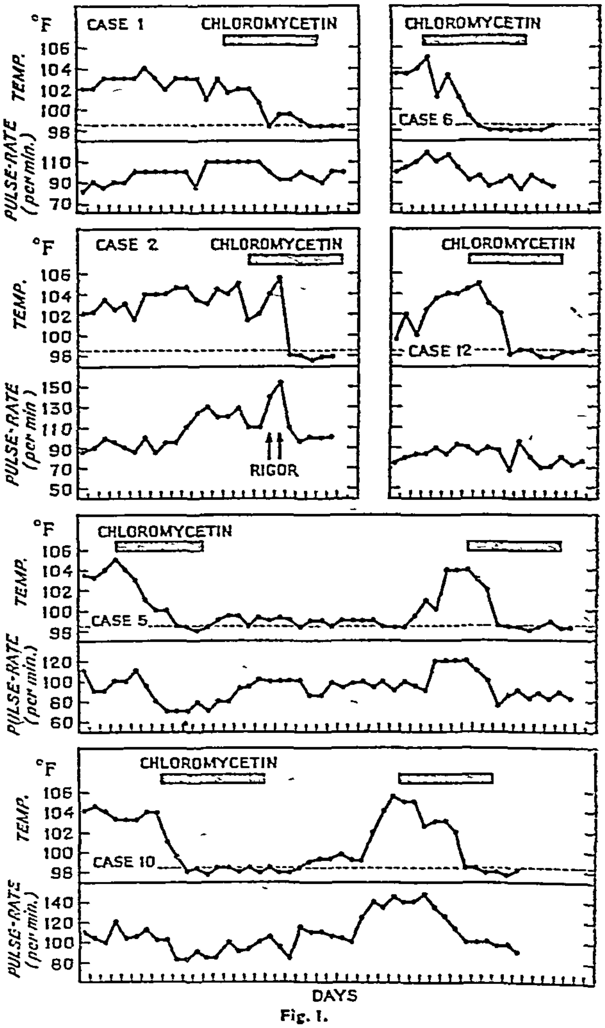

Fig. 1.

By this time she had high fever with severe headache, abdominal distension, vomiting, respiratory distress, and prostration. There were signs of confluent bronchopneumonia in both lungs. Her temperature remained high and her general condition slowly deteriorated. Chloromycetin was recommenced on the 33rd day, but deterioration continued until the 38th day, when there was a slight but definite improvement. The following day she was afebrile and mentally normal, but very weak. Convalescence was uneventful: she started to get up on the 53rd day, and was invalided to the U.K. on the 70th day, ambulant and gaining weight rapidly.

Case 12.—*A case of average severity without complications.* Male, aged 21; lance-corporal, Lancers. Admitted with 4 days' history of headache, malaise, fever, and backache. His spleen was palpable, and *S. typhi* were grown on blood-culture on the 8th day. He became drowsy, with meteorism and occasional vomiting, and chloromycetin was begun on the 11th day. 2 days later he was still very ill and passing fluid stools, but his temperature was beginning to subside. On the 15th day he was afebrile and much improved generally. He started to get up on the 33rd day, and was discharged to convalescent depot on the 55th day.

EFFECTS OF CHLOROMYCETIN IN TYPHOID FEVER

The temperature is the most reliable objective guide to the progress of typhoid fever, and the temperature charts in fig. 1 show clearly the almost dramatic effect of the drug in bringing about rapid defervescence. It can be seen from fig. 2, furthermore, that there is no material difference in the speed of reaction at any stage of the illness: in no case did the fever persist for more than 5 days after administration of the drug was started.

In the less toxic cases the general improvement keeps pace with defervescence, but in the more severely ill it is naturally retarded. In case 2, for example, chloromycetin therapy began on the 27th day of illness, and though defervescence took place in 3 days, mental confusion persisted for 13 and urinary incontinence for 23. Blood-pressure tended to drop as the temperature fell, but rose after a few days to a level higher than that maintained during the febrile stage.

Where toxæmia was relatively mild the first improvement was a subjective one: headache and malaise diminished, and symptoms of respiratory infection subsided. This happened remarkably constantly within 48 hours. The more toxic patients, who were mostly delirious responded less dramatically, but even in them some degree of improvement was discernible on the second day of treatment: vomiting and became less troublesome, and there was partial clearing of consciousness. Appetite usually to return in 4–6 days, and was soon voracious.

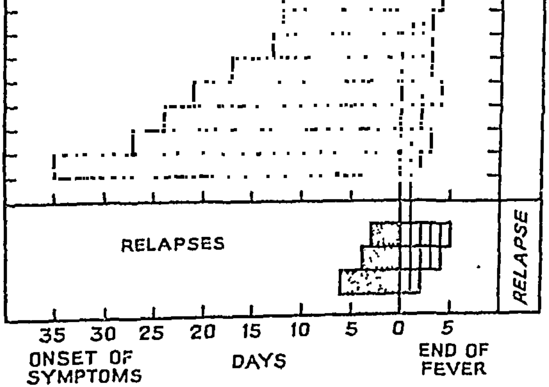

Fig. 2.

Whereas in the earlier and less severe cases the striking effect of chloromycetin is the curtailing length of illness, in the later and very severe accent is on the saving of life. Our cases 2 and 14 regarded as moribund at or soon after the beginning chloromycetin therapy, and case 10 was almost desperately ill during her relapse. In our opinion th patients would have been unlikely to recover with chloromycetin.

In the three relapses in our treated cases chloromyc was just as effective as in the original attack. It noteworthy that the severe respiratory infection was the most important feature of case 10's rel responded within five days of the start of chloromyc therapy, pari passu with the signs and symptoms abdominal infection and toxæmia. Though peni was given in this case there was a strong clinical im sion that the relief of typhoid toxæmia by chloromy was the predominant factor permitting recovery of concomitant respiratory infection.

The effect of chloromycetin on complications ca be judged on so small a series. The complications extreme debility (*bedsores, skin sepsis, parotitis,* should, of course, be reduced almost to vanishing-po As in the case mentioned above, respiratory infecti (which is so constantly present that it should be look on as part of the disease rather than as a complicati was usually relieved by chloromycetin, like the o clinical manifestations of typhoid fever. Perfora did not occur in any of our treated cases, but there intestinal hæmorrhage during treatment in one pa (case 2), and after treatment in another (case 3), ciding with the onset of a relapse. Both hæmorr and perforation have been reported by Woodward (1948), who point out that the intestinal lesions re time to heal after the arrest of the active infection.

Clinically speaking, the effect of chloromycetin se to be to arrest the disease at whatever stage it reached, and to sterilise the blood at the same ti defervescence takes place within five days, and valescence then starts. In consequence a patient tre fairly early in his illness is spared much of the drawn- fever and toxæmia associated with the classical pic of typhoid, and begins his convalescence with relati little debility. He also has much more strength which to meet late complications and relapse, if occur. After 14 days free of fever it is usually neces to curtail rather than encourage activity, and the ea *return of appetite is noteworthy.* It is fair, in fact say that the period of convalescence is halved by tr ment with chloromycetin within the first two weeks the illness.

As regards late cases, so much damage has alre been done here that, as we have said above, the acc is inevitably on the saving of life; but even in th cases the total length of the illness must be considera diminished.

No toxic effects were observed in patients giv chloromycetin. Nausea and vomiting were present, i at all, before the drug was given. No particular effec were noted on the blood picture or the urine.

It is obvious but worthy of comment that chlo mycetin considerably eases the heavy burden that typh fever imposes upon the nursing staff, and in these da of universal shortage of nurses this is not the least the benefits it confers.

Our results and clinical observations cannot be treat statistically. In general, however, they are in accord with those of Woodward et al. (1948).

SOME COMMENTS

age.—The fact that relapses are seen in treated s suggests that the dosage used was not optimal, when the drug is more plentiful larger doses might iven with advantage. The present initial dose is it as much as a severely ill patient can manage. the effect of increasing the dose after a few days, the patient is fitter, might be tried.

lapses occurred in 3 cases, all of which had been ed early in the disease and responded rapidly. It s possible that early treatment does not allow the levelopment of immunity. This suggests a profitable of investigation which we have not been able to w up.

rly Diagnosis.—Now that an effective specific treat- t is available for the enteric fevers, the importance rly diagnosis is apparent. In parts of the world e "P.U.O." is inevitably one of the commonest ical diagnoses on admission to hospital, and where enteric fevers occur sporadically, early diagnosis nds on early blood-culture.

wing to the usually insidious onset of the enteric rs, and the difficulties of early diagnosis, it will be for treatment to commence earlier than the second k of the disease.

anagement.—Despite the efficacy of chloromycetin, re impressed by the fact that typhoid fever remains vere and potentially dangerous disease. calling as in past for a high degree of skill and vigilance on the of the medical and especially the nursing attendants.

SUMMARY

series of 25 cases of typhoid fever is presented. Of 14 treated with chloromycetin, 3 relapsed but res- ded to a second course. There were no deaths in treated cases, 1 in the untreated.

general terms the effect of chloromycetin was to ninate the fever within five days, and to arrest the gress of the disease at the stage reached.

o toxic effects were observed with chloromycetin.

hloromycetin appears to be an effective agent against hoid fever, which nevertheless remains a severe ase.

e wish to express our gratitude to Brigadier W. R. D. hilton, O.B.E., consulting physician, Middle East Land es, who suggested and made possible this investigation, whose advice and encouragement at all stages have n invaluable; to Lieut.-Colonel A. P. Trimble, R.A.M.C., er i/c medical division, for granting us every facility to y on the work and for allowing us to include case 14 providing us with the case-notes; to the Officer Com- ding the Central Pathological Laboratory, M.E.L.F., and staff, for carrying out the pathological and bacteriological estigations; and to the nursing officers and nursing erlies for their ready coöperation in the midst of their ting duties.

e are indebted to Colonel W. J. Officer, O.B.E., commanding British Military Hospital, Fayid, and to the Director of dical Services, Middle East Land Forces, for permission to lish this paper.

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". . . the forty-nine years which have elapsed since the discovery of Mendel's work would have sufficed to supply e present generation of animal breeders with material of e utmost value, had the adoption of inbreeding programmes t been delayed by prejudice and inertia, reinforced perhaps y superstitious fear. The example of their success in plant eeding is, however, now so overwhelming that serious eps will certainly be increasingly taken to make similar provements in the breeding of livestock."—Prof. R. A. SHER, F.R.S., in *Theory of Inbreeding*. Edinburgh: Oliver & oyd. 1949.

MALIGNANT DISEASE OF THE THYROID GLAND

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INTEREST in diseases of the thyroid gland has lately been focused mainly on the possibility of controlling thyrotoxicosis by non-surgical means. This seems to be an opportune time to show that nodular goitre must be treated by surgery, whatever views one may hold on the best method of dealing with the toxic types.

The cases reviewed here comprise all the cases of goitre admitted in 1931–44 under the care of the late Cecil Joll to the Royal Free and Royal Cancer Hospitals in which malignancy was finally diagnosed. We hope that the evidence brought forward will convince the reader that *a localised nodule in the thyroid gland should be regarded* in the same way as a localised nodule in the breast and submitted to histological examination as soon as possible.

INCIDENCE

The malignant adenoma is the commonest malignant neoplasm of thyroid tissue. Graham (1925) states that this tumour constitutes 85% of all carcinomata of the thyroid gland, and his findings have been accepted by most other workers. Hence it is this group whose detection and cure offer the greatest scope and the best results in the war against thyroid carcinoma.

Lahey (1941), who also emphasises that most thyroid carcinomata arise in adenomata, has always advocated the removal of adenomata to forestall malignant change. The patient's age or the size of the adenoma gives no guarantee that it is not malignant. Cattell (1946) states that "it is well recognised that malignant disease of the thyroid most frequently arises in the discrete fœtal adenoma. *All* should be removed irrespective of the age of the patient or the size of the adenoma."

That this advice is sound is shown by the fact that almost every writer on this subject emphasises the difficulty of diagnosis. This is not surprising when one remembers that, in Graham's classical paper (1925), photomicrographs of different parts of the same malignant adenoma are reproduced which show all the varied histological pictures from simple colloid adenoma to frank cancer.

Cole et al. (1945) found that 24% of solitary nodules in the thyroid gland, but only 11% of the multinodular type, showed features of malignancy. This incidence is considerably higher than that quoted by most other workers:

Joll (1932) estimated the incidence of malignant change in adenoma at 1%. Cattell (1946) states that about 4% of discrete thyroid adenomata show histological evidence of malignancy. Ward (1944) gives the incidence as 4·8%. Pemberton and Lovelace (1941) found malignancy in 11·4% of cases diagnosed as fœtal or papillary cystadenoma. Balfour estimated the incidence at 1·6%, and Mears at 3·2%. in nodular goitre (both cited by Lahey et al. 1940).

One of the most interesting studies in this connexion is that of Hinton and Lord (1946), who compared the solitary nodule in the thyroid gland with that in the breast. They found, from 200 consecutive biopsies of tumours of the breast at the New York Hospital, that 6·7% of clinically benign lesions were malignant, but in their own series of 184 clinically benign nodular goitres 7·6% were cancerous. They state emphatically that

"All non-toxic nodular goitres—single or multiple—should be removed surgically because of the high incidence of unsuspected cancer, a rate which exceeds that of cancer of the breast in the clinically benign group."

Much of this work is American; it may therefore disarm criticism if the figures of the Royal Free Hospital (table I) are given, since diseases vary somewhat in different countries.

TABLE I—THYROID NEOPLASMS AT THE ROYAL FREE HOSPITAL

Type of neoplasm	Year								Total
	1931	1932	1933	1934	1935	1936	1937	1938	
Localised nodular goitre	32	37	28	35	28	47	37	34	278
Generalised nodular goitre	23	16	41	4	10	31	37	47	209
Retrosternal adenoma	..	..	..	2	6	1	1	..	10
Malignant adenoma	..	..	3	3	..	5	9	13	33
Total adenomata ..	55	53	72	44	44	84	84	91	530
Other forms of thyroid carcinoma	6	2	..	1	6	5	6	6	32

Table I shows that in eight years there were 530 nodular goitres, which included 33 malignant adenomata—an incidence of 6·2%. The incidence of other forms of thyroid carcinoma (32) in this series is 6·0%. The figures in table I support our previous statement that there is a sufficiently high rate of malignant change in thyroid adenomata to render excision of all such nodules advisable.

However, lest it be objected that careful clinical diagnosis and observation should enable one to predict the possibility of malignancy in a given nodule, we examined the case-records of 44 patients with non-toxic nodular goitre in which a malignant change in a nodule was ultimately diagnosed. In these a clinical diagnosis of possible malignancy had been made in only 3 cases. These cases were all seen in a clinic where large numbers of goitres were being seen regularly, and so, if such diagnosis were possible, the conditions were ideal. When it is remembered that the earliest histological sign of malignant change is invasion of the veins, and that invasion of the capsule is a comparatively late sign, it will be obvious that even the best clinician cannot expect to make even a small proportion of correct diagnoses, and all writers on this subject are agreed that, even under the microscope, the difficulties may tax the skill of the pathologist to the utmost.

Most of the histological examinations in this series were performed by the same pathologist; thus a desirable uniformity has been achieved. The main difficulty lies in the criteria adopted for classifying adenomata as malignant, and in this series the standards suggested by Vaux (1937) have been largely adopted. In the main these correspond to Graham's (1925) original work, and it was accepted that 60% of such cases could be diagnosed on morphological grounds, while, in the remainder, invasion of the blood-vessels, or the close relation of the neoplastic cells to vascular endothelium, was accepted as evidence of malignancy.

RESULTS OF OPERATION

It now remains for us to show that operation carries a negligible mortality, and that its results are good.

Mortality

In the years for which complete records are available at the Royal Free Hospital—i.e., in 1931–38 inclusive—there were 334 operations for non-toxic localised nodular goitre and malignant adenomata, with 2 deaths—a mortality of 0·6%. In the same period there were 197 operations for non-toxic generalised nodular goitre, with 3 deaths—a mortality of 1·52%. Among them were 10 retrosternal cases, with 1 death. If we these, there were 187 operations, with 2 dea mortality of 1·07%. Many of these were "bad cases which had been referred for that very hence the mortality-rate cannot be said to be too

In the same period operations of various types performed on 32 cases of carcinoma of the thyr without a single death, a fact which shows the safety biopsy.

Follow-up Results

Table II shows the follow-up results of operati in those cases of thyroid carcinoma from the se which we examined in person. In all of them malignan was proved histologically, but the cases are divided two groups according to whether malignancy was was not suspected preoperatively.

The results of operation in the cases where malignan had not been suspected were almost uniformly goo whereas once signs of malignancy had appeared t prospects of cure were much reduced. We do not im that treatment of thyroid carcinoma is hopeless, fo certain types the results are good, and some wo —e.g., Lahey et al. (1940)—have found a better surv rate in cases of papillary adenocarcinoma than in of adenomata in which malignancy had been diagn on the invasion of blood-vessels. Ward (1944) clai that his 5-year cures were 20% if malignancy had b diagnosed or suspected before operation, 40% if it been first suspected at operation, and 80% if it only been revealed by histological examination of specimen obtained at operation.

Our figures (see below) show that, where full rout treatment—i.e., operation and postoperative irradiati —was given, the survival-rate for all forms of thyr carcinoma was surprisingly high, and for malign adenoma almost uniformly excellent.

TABLE II—FOLLOW-UP RESULTS OF OPERATION IN CASES THYROID CARCINOMA IN WHICH MALIGNANCY WAS UNSUSPECTED, AND (B) SUSPECTED ON CLINICAL GROU BEFORE OPERATION

Condition at follow-up	Years since operation								To
	3	4	5	6	7	8	9	10 or more	
(A) *Malignancy unsuspected*									
Without signs or symptoms	5	5	5	7	..	5	6	12	
With signs or symptoms suggesting recurrence	..	..	..	..	..	..	1	1 1	
Dead of recurrence ..	..	..	..	..	..	..	..	..	
Dead of other cause ..	..	..	..	..	..	..	..		
[illegible]									
[illegible]	..	1	1	..	..	1	1	..	
[illegible]	..	..	1	..	..	..	..	..	
Dead of recurrence ..	..	..	..	..	..	..	..		

Malignant Adenomata (50 Cases)

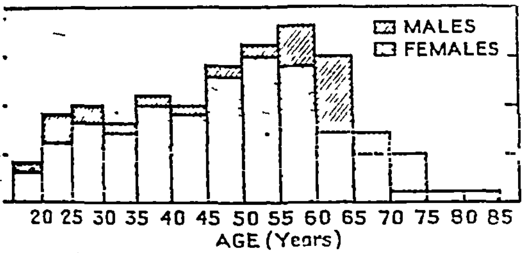
After five years 10 patients were untraced but alive a well when last seen, and of the 40 traced all were al and well.

After ten years, of 10 patients who had undergo operation ten or more years previously, 1 was untrace Of the 9 patients traced, 1 had died of cancer after seve years, 1 was alive and well after treatment to a secon primary neoplasm in the ninth postoperative yea and 7 were alive and well.

Other Forms of Thyroid Carcinoma (24 Cases)

After five years 4 patients were untraced, of who 3 had probably died of carcinoma, 12 were alive and wel 1 was alive after removal of recurrence, and 7 had die of cancer.

After ten years, of 11 patients who had undergone operation ten or more years previously 1 was untraced.



e-incidence of all types of malignant disease of thyroid gland.

e alive and well, 1 had died of intercurrent disease e eighth postoperative year, 1 was alive after treat- of a recurrence in the second postoperative year, had died of cancer.

AGE-INCIDENCE

many writers have emphasised, the age of the nt or the duration of symptoms gives no guarantee a thyroid nodule is benign. Lahey et al. (1940) cite the e case of a girl, aged 20, with a small thyroid adenoma h had been present for three years, who died of brain stases after partial thyroidectomy and postoperative iation to the extent of 7000 r. Pemberton and llace (1941) state that malignant thyroid disease is ively common in younger patients, and 22% of cases of carcinoma of the thyroid occurred in nts under the age of 20.

e age-incidence of all forms of thyroid carcinoma ur series is shown in the accompanying figure. In case of the youngest patient symptoms had been noted at the age of 3 years, and in the whole Royal Hospital series for 1931–38 27% of patients with oid carcinoma were under the age of 30 when ted, but the relatively small number of cases renders lusions risky. In all forms of thyroid carcinoma verage age at operation was 42·7 years, with extremes and 83 years, and the average duration of symptoms been 6·98 years, with extremes of 39 years and 5 s for malignant adenoma and 4 years and 1 week ther forms of carcinoma. Only 34·6% of the patients complained of an increase in size of the lump, and any of these the increase had been very gradual.

TREATMENT

he general lines on which the patients in this series e treated are as follows.

peration.—If a localised nodule was present, it was oved by the usual method of resection-enucleation. he presence of several nodules made wider resection isable, the affected lobe was excised to remove all affected tissue. If the appearance or consistence of tumour when exposed at operation suggested carci- na, the affected area was resected, as wide a margin healthy tissue as possible being removed. If any cent tissue was adherent or infiltrated, as wide block removal" as possible was done.

ostoperative Irradiation.—All the patients received toperative irradiation, but dosage varied widely. e early cases, from the 1920s until the middle 1930s d several series of treatments with small doses, but er 1935 one series was usually given, starting with fairly low dose but sometimes being stepped up to 00 r, the usual dose being 2500–3000 r. A more detailed cription of radiotherapeutic measures has been given Graham and McWhirter (1947).

RECURRENCY

Recurrent nodules should be even more suspect. In e present series there were 7 cases of recurrent nodules; 3 of these proved (at the second operation) to be frankly carcinomatous though originally either innocent or of the malignant adenoma type. Three interesting cases will be described in more detail.

Case 1.—A woman, aged 27, developed a small adenoma in the right lobe of her thyroid. This was removed by enucleation-resection and found to be a malignant adenoma. She remained well for ten years and then noted another swelling in the left lobe of her thyroid. This was removed by enucleation-resection, and the pathological report was: "A single adenoma composed of columns and solid masses of anaplastic cells. There are many thin-walled vessels, some containing cells in their lumina. Histologically, a malignant adenoma, which corresponds to descriptions of earlier adenoma."

Case 2.—A woman, aged 41, had a seven-eighth partial thyroidectomy for generalised nodular goitre, and histological examination revealed a papillary adenocarcinoma in one area. Deep X-ray therapy was given postoperatively and the patient remained well for eight years. She then began to notice breathlessness on exertion, lassitude, and some loss of weight; when seen two years later she had no toxic signs, but there was a firm nodule about $^1/_4$ in. in diameter in the region of the thyroid cartilage on the right side. The nodule did not seem to be attached to deeper structures, but after a few weeks' observation it was decided that exploration was advisable.

At operation an oval mass of abnormal thyroid tissue about an inch long was found adherent to the carotid sheath, trachea, and sternohyoid muscles. It was removed, and the pathological report reads: "Multiple small adenomata both colloid and fœtal; one edge shows invasion by carcinoma cells. One subgroup bears some resemblance to adenoma of eleven years ago, but remainder shows little differentiation. The original carcinoma seems to have recurred."

Case 3.—A girl, aged 14, was first seen in December, 1934, when partial thyroidectomy was done, and section of the specimen showed papilliferous adenocarcinoma. In January, 1935, the patient received a routine course of radiotherapy. In January, 1936, she reported with enlarged cervical lymph-nodes. These were excised, and further nodes were excised in April of the same year. On each occasion the excised masses consisted of lymph-nodes invaded by adenocarcinoma. In April she had a further course of irradiation, but by July further enlarged nodes were present. These were excised and on section showed "much infiltration of surrounding tissue and invasion of veins." Two more courses of irradiation were given in August and September, 1936. After this the patient was seen at regular intervals with no evidence of recurrence. In May, 1945, nine years after the last treatment, a soft rounded mass was noted in the thyroid region. In January, 1946, it grew bigger and was excised. On section the mass showed features of both malignant adenoma and carcinoma. In May, 1946, the patient was admitted for excision of a further nodule in front of the trachea; this was found at operation to extend down behind the suprasternal notch, and section showed that it was a papillary adenocarcinoma. In December, 1948, a further nodule was excised, from the left side of the trachea, and this again proved to be an adenocarcinoma on section. In March, 1949, a further nodule was found, in front of the trachea and proved at operation to be a recurrence in the pyramidal lobe.

The third case is remarkable for the long survival despite repeated local recurrences—fourteen years since the first operation—particularly in view of the patient's youth when first seen.

These 3 cases show the necessity for long-continued postoperative supervision, and the dangers of drawing conclusions from the results in cases less than five years after treatment.

CONCLUSION

It is agreed by those with wide experience of thyroid carcinoma that all non-toxic nodular goitres should be removed surgically, but it may require a good deal of moral courage on the part of the general practitioner to persuade a patient with a small nodule in the thyroid gland, which may have been present many months without causing symptoms, to submit to operation.

It is hoped that the arguments propounded here will provide sufficient inducement to this desirable end.

We wish to thank the staffs of the Royal Cancer and Royal Free Hospitals for permission to use the hospital records; Prof. D. W. Smithers for his encouragement and advice; and Dr. H. O. Hartley for helpful criticism.

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STREPTOMYCIN IN THE TREATMENT OF TUBERCULOUS SINUSES

REVIEW OF 11 CASES

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THE results of treatment of tuberculous cutaneous sinuses with streptomycin at the North Wales Sanatorium since September, 1948, have been so dramatic that this early review seems justified.

The pronounced effect of systemic streptomycin on tuberculous sinuses has been reported by several workers (Hinshaw et al. 1946, American Trudeau Society 1947, Feldman and Hinshaw 1948). Brock (1948) reviews 12 cases with a total of 60 draining sinuses. He used a dosage of 1·8 g. daily, divided into six doses given every four hours, for 90–150 days, with an interval in the longer courses; in 10 cases the sinuses originated in bone, 1 sinus was ischiorectal, and 1 developed after laparotomy. The average duration of the sinuses before treatment was two years. Only 1 sinus remained patent after four months, and most of them closed within twelve weeks of the start of treatment.

The present review is of 11 cases with 28 draining sinuses; in 5 cases the sinuses originated in bone and joint, in 3 cases they developed in thoracoplasty wounds, in 2 cases they followed nephrectomy, and in 1 case Monaldi drainage. The dosage of streptomycin adopted was usually 1 g. daily, but in some acute cases 0·75 g. was given twice daily; the total dose depended on the response, and no local treatment with streptomycin was attempted. In all the 8 proved tuberculous cases the tubercle bacillus was of the human type.

THERAPEUTIC EFFECTS

General.—One of the most conspicuous features in all the cases was the exceptional improvement in the patient's general condition, which was subsequently maintained; in cases 7, 9, 10, and 11 (see table) the response was such that, owing to the extreme sinus cachexia, streptomycin therapy was a life-saving measure. The control of the toxæmia was reflected in the temperature chart; in most cases the temperature settled within three or four weeks of the start of treatment. An improved appetite was a notable feature of all cases, and the few patients who were weighed regularly showed a definite increase of weight during and after treatment.

Local.—A favourable local response to streptomycin was shown by the discharge from the sinus becoming serous instead of purulent and diminishing in quantity. This occurred within three or four weeks of the start of streptomycin therapy and was followed by the development of healthy granulation tissue, a scab, and finally a firm healthy scar. A similar observation was by the American Trudeau Society (1947), F Hinshaw (1948), and Brock (1948). In the present 74% of the sinuses healed within three months, further 25% after three months; and the single remaining open looks much healthier. No reopened. One required plastic surgery owing to The time taken by the sinuses to close was as

ANALYSIS OF CASES

Time taken	*No of sinuses*
One month	2 (*7·1%*)
Six weeks	8 (*28 6%*)
Two months	2 (*7·1%*)
Three months	8 (*28 6%*)
More than three months	7 (*25%*)
Remained open	1 (*3 6%*)

The average duration before treatment was ab 11½ months, and the average length of time since clo is 3 months 3 days, the longest being 7 months 15 day

Other Lesions.—No change was observed in pulmo lesions, and only one case of early joint (case 7) showed a striking improvement (see

Complications.—There was some discomfort at of injection in most cases, but it was never Cases 3, 5, and 7 had some transient giddiness in the few weeks, but the dosage was not reduced, permanent vestibular damage was apparent. Case 7 a mild urticarial rash on the face on the fiftieth d but it subsided rapidly when 'Benadryl' was giv These complications were less than had been expec from earlier reports and confirm the observation th if the dosage is kept below 2 g. daily, complicati are considerably reduced (Medical Research Cou 1948).

DISCUSSION

Sinuses may be arbitrarily divided into three m groups: (1) those, usually multiple, which give rise extreme cachexia and are usually associated with spreading lesion; (2) those, usually single, which or may not give rise to much cachexia and are usu associated with a localised lesion which is not spreadin and (3) the chronic sinus which may persist for ye after the underlying lesion has healed and which compatible with a healthy active life. These are pro ably caused by tuberculous infection of the surroundi soft tissues (Hawkins and Thomas 1946) and shou respond well to streptomycin.

Ten years ago almost all the patients in group 1 a some in group 2 died, the treatment, which was usu ineffective, consisting of such measures as ultravio irradiation. Secondary infection was an extreme serious complication in all these groups, leading amyloid disease in many cases. With the use of sulphonamides and penicillin the dangers of second infection were reduced, but even then 5% of pati with combined skeletal and pulmonary disease died sinus cachexia (Hawkins and Thomas 1946).

The present series shows that 93% of a varied collec of sinuses closed within four months of the start streptomycin therapy, and that streptomycin had a m pronounced effect in controlling sinus cachexia. Th prognosis of sinus cases is therefore improved with th form of therapy, and the following conclusions may b drawn.

Sinuses Originating in Bone and Joint Tuberculosis

Of patients with bone and joint tuberculosis, 30% develop abscesses, of which 76% break down to form sinuses (Hawkins and Thomas 1946); this type of ca reacted dramatically to streptomycin. Both Girdlesto (1940) and Mercer (1944) emphasised that the progno in tuberculosis of bones and joints is materially worse a sinus forms and becomes secondarily infected. The defined the treatment of abscesses as primarily conserva and in their view the abscesses should not be aspi- . unless there is pressure on vital parts, extreme on of the skin, or secondary infection. In pyogenic tions with pus formation early drainage is an oted surgical principle. With the aid of streptomycin may now be applied to tuberculous abscesses, and ated aspirations with the attendant dangers of idary infection and possible ultimate sinus formation ld be discarded in favour of relatively early and ive drainage under cover of streptomycin. Feldman Hinshaw (1948) mentioned this in their earlier al reports, and both they and Brock (1948) laid on the tremendous importance of adequate drainage scesses if streptomycin is to have the desired effect. necessity for not only free but also early drainage is rated in the present series, the most striking results ıg been obtained in patients with recent severe activity.

ses Originating in Thoracoplasty Wounds

the past this type of sinus was very resistant to all s of treatment. This was probably because the sinus lly originates in a patent intrapleural or extrapleural , which is often infected with tubercle bacilli; and, this space is obliterated, the sinus cannot close. 4 illustrates that streptomycin will sterilise these es and so allow them to close either by approxi- on of the walls or by the formation of healthy nlation tissue.

ANALYSIS OF CASES

Type and duration of disease	Site of sinus and duration before treatment	Dosage of strepto-mycin and total given	Swab culture before treat-ment	Duration before closure (days)
Bilateral pulmon-ary 17 yr.	Rt. anterior chest, 4 mos.	1 g. daily, (47 g.)	+	33
Pulmon-ary, 2 yr.	(1) and (2) Pos-terior chest, 12 mos.	1 g. daily (131 g. in two courses of 47and 84 g.)	(1) and (2) +	(1) 169, (2) 178
Pulmon-ary, 8 yr.	(1), (2), and (3) Posterior chest, 25 mos.	0·75 g. b.d. (still in progress)	(1), (2), and (3) +	(1) 10, (2) 74, (3) 69
Bilateral pulmon-ary, 2 yr.	(1) and (2) Anterior chest, 3 days	0·5 g. b.d. (90 g.)	(1) and (2) +	(1) 75, (2) 20
Renal tract, 6 mos.	(1) and (2) Lt. nephrectomy wound, 3 days, (3) Scrotum, 2 mos.	1 g. daily (90 g.)	(1), (2), and (3)—	(1) 92, (2) 92, (3) 63
Rt. kidney	(1) Rt. groin, 5 mos. (2) Rt. loin, a few days	1 g. daily (still in progress)	(1) and (2) —	(1) 42, (2) 90
Spinal caries (L5), 18 mos.	(1) and (2) Rt. groin, 12 mos.	1 g. daily (90 g.)	(1) and (2) +	(1) 88, (2) 90
Spinal caries (L1, 2, 3), 18 mos.	(1) Lt. loin, 17 mos. (2) Rt. iliac fossa, 4 mos.	1 g. daily (90 g.)	(1) + (2) not done	(1) open, (2) 73
Spinal caries (L5)	(1) Rt. groin, 5 mos. (2) Rt. loin* (3) Lt. loin*	1 g. daily (90 g.)	(1), (2), and (3) +	(1) 99, (2) 99, (3) 200
Rt. hip, 22 mos.	(1) to (6) Rt. upper thigh, 1–12 mos.	1 g. daily (90 g.)	(1) to (6), none taken	(1) 137, (2) 137, (3) 100, (4) 64, (5) 69, (6) 66
Doubtful lesion of rt. sacro-iliac joint, 3 mos.	(1) Rt. iliac fossa (fæcal fistula), 4–12 mos. (2) Lt. loin, 2 days	1 g. daily (90 g.)	(1) and (2) +	(1) 63, (2) 63

Formed a few days after streptomycin treatment was begun.

Secondary Infection with Pyogenic Organisms

Cairns (1949) found that culture plates exposed in the operation field during intracranial operations always yielded a bacterial growth despite the most rigid precautions, but such precautions can hardly be expected during the dressing of sinuses, and thus it is almost impossible to prevent secondary infection in every case. The present series shows that, where there is delayed healing or only little response to streptomycin, a swab often reveals secondary infection, and this possibility must always be borne in mind. The onset of secondary infection is accompanied in most cases by a change from the low-grade remittent fever of tuberculous toxæmia to the high intermittent fever characteristic of pyogenic infection.

The impression has been gained that penicillin-resistant staphylococci seem more common in tuberculosis than in other diseases. Continued treatment with sulphonamides and penicillin in such cases has given very satisfactory results. Case 11 shows that in the presence of a mixed infection with the tubercle bacillus and the *Bact. coli* group of organisms streptomycin alone can produce a dramatic response.

Effect on Bone and Joint Tuberculosis

Previous reports gave no hope that streptomycin had any effect on established bone or joint tuberculosis, and no effect was seen in 4 of the 5 cases treated in the present series, the skeletal disease being old-standing. In case 7, with tuberculosis of the fifth lumbar vertebra and multiple sinuses, a fresh lesion in the hip appeared while streptomycin therapy was in progress. For four months this lesion clinically improved rapidly, though without any material change in the radiological appearances. This improvement took place despite the fact that the patient could not tolerate adequate immobilisation, because of his extremely poor condition and the positions of his multiple discharging sinuses.

Length of Treatment

A ninety-day course of streptomycin therapy seems to be satisfactory in most cases, and the persistence of sinuses is no indication to continue longer, because some may still close. A second course may be given after a short rest if there is renewed sinus activity.

Streptomycin Sensitivity Test

Owing to the delay before the result of a laboratory test of sensitivity can be known, it seems to be of little clinical value unless a second course of streptomycin seems necessary.

Significance of Swabs

In the choice of cases for streptomycin therapy it has been found that the inability to recover tubercle bacilli is no reason to withhold streptomycin if, from the history and the appearance of the granulations, the sinus is obviously tuberculous. As previously pointed out, the more active the sinus the better the response, and this is logical in view of the bacteriostatic action of streptomycin and is supported by the fact that in some of the present cases a negative swab was obtained immediately before the sinus closed.

SUMMARY

Systemic streptomycin therapy has been given to 11 patients with 26 draining cutaneous tuberculous sinuses, which in 5 cases originated in bone and in 3 followed thoracoplasty, in 2 nephrectomy, and in 1 Monaldi drainage.

This treatment has a definite value for sinuses developing in thoracoplasty or abdominal wounds of tuberculous origin, and the response of sinuses originating in bone is dramatic.

A plea is made for the treatment of tuberculous abscesses by early drainage under streptomycin cover,

but further experience will be necessary to determine the best time for such drainage.

I am grateful to Dr. F. S. Hawkins, Dr. G. O. Thomas, and Mr. J. Howell Hughes, F.R.C.S., for their advice during the preparation of this paper.

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GASTRIC SECRETION AND SUBSEQUENT DYSPEPSIA

A FOLLOW-UP STUDY[*]

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FIFTEEN years ago Lander and Maclagan (1934) investigated the response of 100 normal medical students to histamine test-meals. The students were all healthy, any that had had gastro-intestinal symptoms having been excluded. They do not therefore provide a random sample from the point of view of determining the liability to develop ulcers, but they do provide an opportunity for determining whether there is an association between gastric secretion in health and the subsequent development of dyspepsia.

Records of 99 of the subjects are still available. Gastric secretion had been stimulated by an injection of 0·5 or 0·75 mg. of histamine,[†] and measurements had then been made of the highest free acidity and the volume of juice and amount of free acid secreted per hour.

The subsequent medical history has been obtained by a questionary. Three of the original 99 are known to have died, and the addresses of 10 others cannot be traced; 85 of the remaining 86 have answered the questionary.[‡]

One of us (F. A. J.), who had no knowledge of the results of the previous test-meals, has divided the subjects into four groups, as follows, according to the history given in reply to the questionary:

(1) No history of dyspepsia (45 cases).

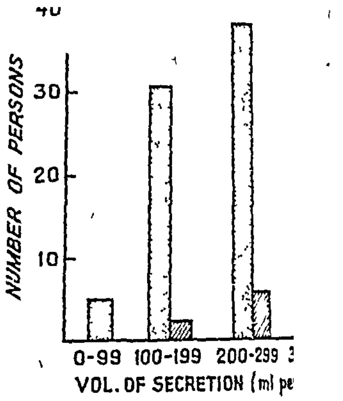
(2) History of minor dyspeptic symptoms—e.g., heartburn or belching (12 cases).

(3) History of significant abdominal pain not suggestive of ulcer—e.g., associated with diarrhœa, persisting continuously for several days, or occurring in isolated attacks (9 cases).

(4) History of dyspepsia suggestive of ulcer—i.e., attacks of epigastric pain related to meals and occurring in bouts (10 cases).

Group 4 contains 3 men in whom a peptic ulcer had been clinically diagnosed, but in no instance had an ulcer been proved radiologically or by operation.

The results of the original test-meals, averaged for each group, are shown in table I.



Volume of gastric juice and develo of subsequent symptoms: hatched co dyspepsia suggesting peptic ulcer; columns, other or no dyspepsia.

The groups are comparable as regards sex and age, all the subjects are men, and the average age of each group at the time of the test-meal was 21·8–22·8 years.

From table I it is evident that the highest free acidity attained was practically the same in all the groups. In contrast, the average volume of juice secreted by those who subsequently developed dyspepsia suggesti ulcer was significantly greater than that secrete the others. The difference in the average amou free acid secreted was almost significant and was evi more closely related to the volume of juice se than to the maximum acidity.

Similar results are obtained by an analysis of va applied to all four groups, when it can also be s that there were no significant differences among the non-ulcer-type groups.

The variation in the volumes of juice secret shown by the frequency distribution of the indi results, as follows:

Vol. of juice (ml. per hour)	*No. of men*	
	Ulcer-type dyspepsia	*Others*
0– 99	0	5
100–199	2	31
200–299	6	39
300 +	2	0

From this it will be seen that all the cases of dys suggestive of ulcer occurred in subjects who had se more than 100 ml. of gastric juice an hour (se accompanying figure).

DISCUSSION

Ryle and Bennett (1937) reported a similar inve tion. They followed up 120 men who had had test-meals 12–15 years previously, when in good g health and completely free from digestive sym Their results are summarised in table II.

Ryle and Bennett concluded that they could no any support for the view that hyperchlorhydria necessary precursor of the tendency to ulcer. material cannot be compared exactly with the p

TABLE I—GASTRIC SECRETION AND SUBSEQUENT SYM

Symptoms subsequent to test-meal	No. in group	Highest free acid (ml. *N*/10 HCl per 100 ml. juice)		Vol. of juice (ml. per hour)		Am of acid *N*/10 per l
		Mean	S.E.	Mean	S.E.	Mean
(1) No dyspepsia ..	45	103 0	±27·6	192·0	±57·9	180 6
(2) Minor dyspepsia	21	103·7	±26 0	199·1	±48 7	189 1
(3) Other dyspepsia not suggestive of ulcer ..	9	101·6	±22 4	187·1	±42 7	158 0
Groups 1–3 ..	75	103·1	±26 6	193·4	±53 9	180 3
(4) Dyspepsia suggestive of ulcer	10	105·6	±19·1	239 3	±59 1	226 4
Total ..	85	103 4	±25·9	198 8	±56 5	185 7

Comparing group 4 with the sum of the other groups:
Highest free acid .. t = 0·28, n = 83; 0·70 <P<0
Volume of juice/hr. .. t = 2·47, n = 83; 0 01 <P<0
Amount of acid/hr. .. t = 1·96, n = 83; 0 05 <P<0 1

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[*] A communication to the British Society of Gastro-enterology.

[†] Eight received only 0·5 mg., but the results were not appreciably different from those when 0·75 mg. was given.

[‡] The 86th reply was received after the results were in print. It did not appreciably affect them.

since detailed figures were not given; in particular, ethod of performing the test-meals did not allow tes to be made of the volume of gastric juice d, the measurement found to be of the greatest t in the present investigation. It is particularly g that, in our series, none of the subjects with a on of less than 100 ml. an hour in response to ine developed symptoms suggestive of ulcer, is the only 2 who had a secretion of more than . an hour have done so.

e is general agreement that most patients with al ulcers show hyperacidity and hypersecretion, is in patients with gastric ulcers the figures are l or below average (Bockus 1943, Ihre 1939). uestion, however, arises whether hypersecretion ctor in the production of duodenal ulcers or is ult of the ulcer. Shay et al. (1942) have shown he normal mechanism by which gastric secretion ibited by the presence of free hydrochloric acid duodenum is depressed in patients with duodenal and they have suggested that the hypersecretion ndary to the ulcer instead of being its precursor. resent series is small, but the results are clear-cut, is reasonable to adduce them in favour of Hurst's that increased gastric secretion predisposes to the pment of ulcer-like symptoms, though whether al ulceration has not been determined.

II—GASTRIC SECRETION AND SUBSEQUENT SYMPTOMS (AFTER RYLE AND BENNETT)

ptoms 12-15 years after test-meal	No. of men with test-meal showing		
	Achlorhydria	Normal acidity	Hyperchlorhydria
Depsia	3	69	8
lyspepsia	2	13	2
ms suggestive of ulcer	0	14	1
ulcectomy)	(0)	(7)	(1)

SUMMARY

subsequent digestive histories of 85 healthy men ad a histamine test-meal performed fifteen years ve been investigated.

have since developed symptoms suggestive of ulcer. The average volume of gastric juice secreted e men in this group was significantly higher than ecreted by the remainder. No difference was found maximum free acidity of the juice secreted.

results support the view that hypersecretion is a rather than an effect of peptic ulcer.

are much indebted to the volunteers who underwent iginal test-meals for their further kind coöperation in eting the follow-up forms, and to Dr. F. P. Lee Lander lowing us to use his records.

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.. Why is it so widely granted that the methods of ht and generalisation used in science do not reach to ems of value? I know nothing to suggest that the ion of value concepts is an activity which is fundaally different from that which goes into creating such pts as space, time, the physical universe, the organisation e nervous system, or the ecology of host and enzyme. . . . ce is concerned with function, with structure, with ion and with organisation. The concepts of value are imple, even when put beside these; and it is certainly bvious either that they are empty fictions, or that they od-given. It is surely time that we thought about their ion to scientific concepts less dogmatically and more ly."—J. BRONOWSKI, *New Statesman*, Nov. 19, p. 586.

ACUTE DISSEMINATED ENCEPHALOMYELITIS FOLLOWING HERPES ZOSTER, VACCINATION, AND IMMUNISATION

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MENINGO-ENCEPHALITIS sometimes complicates herpes zoster and more often follows smallpox vaccination; but meningo-encephalitis following both herpes zoster and vaccination is rare; apparently only 2 cases have been published.

Lillie (1943), who treated successfully 11 cases of herpes zoster ophthalmicus with smallpox vaccine, reported that his first case developed meningo-encephalitis ten months after vaccination. A purulent localised infection of the skin of the nose two weeks before the onset of nervous symptoms was considered to be the probable cause. Madonick's (1946) case of herpes zoster ophthalmicus, treated by vaccination four days after the onset of the rash, developed meningo-encephalitis eight days later. Both of these patients recovered.

The following case is unusual in that the herpes zoster had healed before routine vaccination was done. The subsequent development of the nervous symptoms made the correct diagnosis problematical.

CASE-RECORD

A corporal, aged 39, who had served as a cook in the R.A.F. for the past eight years, had been vaccinated successfully and without ill effect for the first time in November, 1942, at the age of 32. An unsuccessful attempt had been made at revaccination in May, 1945. The patient's previous inoculations had included T.A.B. 0·5 ml. and A.T.T. 1 ml. in August, 1941, and T.A.B.T. 0·5 ml. each subsequent year till 1944. He had also been immunised against diphtheria by two inoculations in February, 1942, and against scarlet fever by five weekly injections at the same time. In childhood he had had measles, mumps, rubella, and influenza, but never varicella or whooping-cough. There was nothing else of note in his previous medical history till the onset of the present trouble.

On Feb. 20, 1949, he developed left-sided frontal headache. Vesicles appeared next day on the left upper eyelid and spread to the left side of the forehead two days later. Apart from the headache, which was severe at the onset, there was little constitutional disturbance, and the patient returned to duty after a week. Though at the onset it was feared that the conjunctiva might be affected it escaped involvement, and this attack of herpes zoster ophthalmicus subsided within a fortnight, leaving scars on the forehead.

Since the patient was due to go overseas and had recovered from the herpes zoster, he was vaccinated for the third time and injected with T.A.B.C. 0·25 ml. and A.T.T. 1 ml. on March 7. After these procedures he experienced no ill effects. The vaccination produced the reaction of immunity, with slight redness of the arm three days later, but this rapidly subsided.

The patient was perfectly well till twelve days later, when he woke up at 4 A.M. on March 19 feeling ill with headache nausea, dizziness, and a feeling of rotating to the left. He vomited four times in the next six hours. After about three hours the dizziness, which had not been associated with tinnitus or deafness, cleared, leaving him exhausted. He then noted diplopia for distant objects; and, when he tried to get up, his left leg gave way under him. He tended to stagger to the left and when he tried to save himself he found his left arm weak and clumsy. On using his hands he noted pronounced shakiness of the left hand.

On examination the patient was febrile, with a temperature of 101°F. There was a coarse nystagmus when he looked to the right and to the left. The optic discs were normal, and the ocular movements appeared full. The lower jaw showed a spontaneous sustained side-to-side movement at the rate of 80 a minute; this disappeared on voluntary effort. There was a left-sided weakness of the muscles supplied by the trigeminal nerve, but cutaneous sensation was unimpaired. All the other cranial nerves were normal. Hypotonia of both arms and legs was present, more pronounced on the left side.

The left arm and leg were weak in all movements, as were plantar flexion and dorsiflexion of the right foot. No fibrillation or wasting was seen. There was gross ataxia of the left arm and leg, with difficulty in performing rapid small movements with these limbs, but no past pointing. All sensations were normal. Reflexes were normal, except the right knee-jerk, and both ankle-jerks were unobtainable. The right plantar response was flexor, and the left equivocal. With the eyes closed the patient immediately lost his balance. Other systems were normal, apart from a slightly raised blood-pressure of 170/90 mm. Hg.

Investigations.—Lumbar puncture on March 26 yielded a clear colourless fluid under a pressure of 100 mm. H_2O, with no evidence of spinal block. The cerebrospinal fluid (C.S.F.) contained 14 lymphocytes per c.mm., 85 mg. of protein per 100 ml., and a slight excess of globulin with the Pandy reaction. It produced no alteration in the colloidal gold curve and gave a negative Wassermann reaction. The blood Wassermann and Kahn reactions were negative. A blood-count and the erythrocyte-sedimentation rate were normal. Audiometry and caloric tests were made but were normal; and so was an electromyogram of the muscles of the arms and legs.

Progress.—The patient slowly improved. His temperature settled within 48 hours. The headache, which was mainly left frontal over the site of the herpes scars, persisted about two weeks and then cleared, by which time the diplopia had disappeared. He began to get up a week later, and, though his left leg gave way at first and was sometimes uncontrollable owing to the ataxia, he could get about with a stick. Within five weeks of the onset of the illness he could walk normally and the clumsiness of the left hand was only slight. About this time the side-to-side movement of the jaw, which had gradually diminished, disappeared. Six weeks after his illness began the patient was fit to be transferred to a rehabilitation unit. The cranial nerves were then all normal, apart from slight weakness of the left masseter muscle; there was slight cerebellar ataxia of the left arm and leg, with some hypotonia; and the right knee-jerk and both ankle-jerks were still absent. The patient returned to duty on July 11.

C.S.F. Changes.—The C.S.F. was examined twice more, at three-week intervals after the onset of nervous symptoms. The findings were as follows:

	After 3 weeks	*After 6 weeks*
Cells (lymphocytes) per c.mm.	11	4
Protein, mg. per 100 ml.	65	35
Globulin	In excess	No excess
Lange gold curve	0012344432	0001210000
Wassermann reaction	Negative	Negative

DISCUSSION

Though this patient appears to have had an acute disseminated encephalomyelitis, from which he has made an excellent recovery, the ætiological agent is not at all certain. At least four possible explanations for the facts can be offered.

(1) The events in the history might all be unconnected. The patient first had an attack of herpes which settled; he was then vaccinated and immunised; finally he had an attack of a demyelinating disease, such as disseminated sclerosis. Apart from the natural desire to bring the events together under one heading, it seems most unlikely that the earlier presence of either the herpes zoster or vaccinia virus had nothing to do with the subsequent symptoms, especially since both are known to produce encephalitis. There was no previous history of any transient episode typical of disseminated sclerosis, and though only the continued observation of the case can eliminate this possibility with certainty, it seems the least likely explanation from the physical signs elicited.

(2) The nervous symptoms may have been due to a herpes-zoster encephalitis, which came on four weeks after the beginning of the cutaneous eruption. In the reported cases the interval between the cutaneous and nervous manifestations varied from none (McCormick 1947) to six weeks (Thalhimer 1924). Thus Krumholz nd Luhan (1945), summarising the interval in 7 published cases, found it to be from four to six weeks in 3 ases in which the clinical manifestations were generalised, nd from one to three weeks in 4 cases where the onset vas with focal signs, such as facial palsy. The interval of four weeks in the present case thus fits in zoster encephalitis, while the fact that the physical were in face, arm, and leg on the same side as the rash, with the motor division of the trigeminal especially involved, supports this diagnosis. A point, emphasised by Schiff and Brain (1930), frequency of myoclonus in zoster encephalitis, and side-to-side movements of the jaw in the present presumably due to involvement of the olivode system, is an example of rhythmical myoclonus. tremors of the lower jaw were noted from time to in the case reported by Madonick (1946) after zoste vaccination. Against the present case being herpes zoster are the low cellular response in the and the rapid return to normality within six w since most of the published cases had a high and persi cell-count.

(3) The third possibility is postvaccinal encepha The onset of the symptoms twelve days after is consistent with this (Glanzmann 1927), as are the C.S.F. changes and quick return to normality. extremely rare, however, for encephalitis to de after a revaccination; according to Dutch exper this occurs in not more than 1 in 50,000 cases. It is less likely to occur after a third vaccination, espe when, as in the present case, the vaccination fails the case reported by Madonick (1946) the patient been vaccinated three times, and this was used as a against a diagnosis of postvaccinal encephalitis. Us in revaccination cases the incubation period is sh than the commonly accepted twelve days after pri vaccination, though there are examples of longer pe in published cases up to thirty-four days (Eckstein For these reasons it seems unlikely that postvac encephalitis is the correct diagnosis.

(4) The remaining possibility is that more than agent was responsible. In Lillie's (1943) case the period before symptoms developed in the nervous sys —the complication of nasal skin infection, and the ab of C.S.F. findings make it impossible to decide what the ætiological agent, but the explanation favoured Madonick (1946) in his case was that the zoster was activated by the second virus introduced by vac tion. This may apply in the present case; the pa genesis might then resemble that in the experiment rabbits by Levaditi and Nicolau (1926) and Zuruka (1927), in which herpes virus placed on the nasal mu or injected subcutaneously was induced, by simultan inoculation of smallpox vaccine, to excite a fatal herp encephalitis. The present case differs from Madon in that vaccination was performed later—fifteen instead of four—when the zoster had subsided instea being at its peak, and the C.S.F. ex changes were less and subsided more quickly. The explanation therefore be different.

A further suggestion is that m yelinoclasis from allergy due to an anti-brain ol. antibody Within a fortnight two viruses, (m herpes zoster vaccinia, and several foreign proteins, ho including and paratyphoid vaccine and tetan us toxoid, introduced into this patient. The pr oteins may h acted as an adjuvant to the viruses, or p ossibly vice ve This case might thus resemble, in the hu man, the exp ments on demyelination in the monkey by Rivers et (1933) and Rivers and Schwentker (1 935), confirm by Ferraro and Jervis (1940). Aqueous emulsions alcohol-ether extracts of sterile normal rabbit br were injected into monkeys and resulted in demyelinat in 7 out of 8 animals; but they did not do this wh combined with vaccine virus in monk ays previou sensitised to normal rabbit brain. In the rabbit, Le (1933) found that fresh homologous brain ti ssue posse little or no antigenic power, whereas Sc hwentker a Rivers (1934), using autolysed brain tissu ie or emulsio

n 0 1 ± ±5 ±5 ±5 grou 0·70 0·01 0·05

h homologous brain infected with vaccine virus, ble to produce antigenic activity as shown by :ation or complement-fixation.

adjuvant technique, whereby antigenic activity ianced by injecting material such as killed tubercle or liquid petrolatum in addition to the antigen, roduced by Freund and McDermott (1942) and en used successfully to produce demyelination. organ (1946) was successful in 7 out of 12 monkeys omologous spinal cord tissue as antigen, and in f 9 with cord infected with poliomyelitis; and et al. (1946) produced rapid demyelination in nonkeys by this technique. In the rabbit, instead ig to administer intracerebral injections of protein ously sensitised animals, as described by Davidoff 932), demyelination can also be produced by this ue (Morrison 1947). Thus, in laboratory animals iin antibodies can be produced by homologous altered by autolysis or made effective by the 1 of adjuvant.

e present case the processes involved may be along lines, with the possibility of auto-antigens being from the patient's own nervous system owing to fection. If this view is correct it might explain sence of features of both zoster and postvaccinal litis.

gh it is unfair to generalise from a particular case, on, if any, to be drawn from this report seems to there is a risk of myelinoclasis if either vaccina-immunisation is undertaken shortly after a virus n. In view of the frequency of these two proce-t seems worth while to inquire for any previous ifection, especially herpes zoster, and to delay ion if there has recently been one.

fourth possibility suggested is correct, immunisa-er an attack of herpes zoster is contra-indicated east 4–6 weeks—i.e., the incubation period of ncephalitis.

SUMMARY

e of acute disseminated encephalomyelitis occur-r weeks after an attack of ophthalmic herpes nd twelve days after combined vaccination and ation is described.

le ætiological factors are discussed, and it is d that foreign protein may act as an adjuvant iruses, thus relating the case to experiments on

e is a history of recent virus infection, especially zoster, it is suggested that vaccination or ation should be deferred because of the possibly l risk of encephalitis.

nks are due to the Director-General of Medical R.A.F., for permission to publish this case; Squadron-I. Meanock, who referred the case to me; Group-V. H. Tompkins for much useful advice and ment; Dr. P. H. Sandifer for helpful criticisms and ns; and Squadron-Leader J. M. White for help with

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HÆMOLYTIC EFFECTS OF MYANESIN

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SINCE the introduction of 'Myanesin' by Mallinson (1947) and Berger and Bradley (1947) several objections have been raised to its use. The most serious of these is the possibility of its causing intravascular hæmolysis and hæmoglobinuria. Though much has been written on this subject, the issue is still confused.

Pugh and Enderby (1947) reported 3 cases of hæmoglobinuria following the intravenous injection of myanesin, and showed experimentally that the intravenous injection of 1·5 ml. of 10% or 5% myanesin in distilled water could produce intravascular hæmolysis. They deduced from their experiments that such hæmolysis occurs in all patients who receive intravenous myanesin, but that, owing to the high renal threshold for the excretion of hæmoglobin, hæmoglobinuria develops in only a few cases.

Lyall (1947) found hæmolysis in 44 of 50 cases in which myanesin had been used, but the hæmolysis was not serious, and there was no hæmoglobinuria.

Stephen and Chandy (1947) gave 30 mg. of myanesin per kg. of body-weight to 12 conscious patients, 10 of whom subsequently voided reddish-brown urine which gave a positive orthotoluidine test for blood but contained no red cells.

Hewer and Woolmer (1947) reported a case of fatal uræmia following an operation for which myanesin had been given. Hæmaturia had been noted on the fourth and fifth days after operation, and the patient died on the sixth day. The necropsy findings were similar to those in incompatible blood-transfusion, and it was suggested that death was due to renal anoxia following peripheral circulatory failure. A similar case was reported by Goodier and Goodhart (1949) in which complete anuria developed on the fourth day after the administration of myanesin; but this patient had also had 13·5 g. of sulphadimidine ('Sulphamezathine'). At necropsy the kidneys showed much cortical damage, in places amounting to necrosis.

Noble (1948) reported the case of a boy who received myanesin under anæsthesia and next morning passed 8 oz. of urine containing much free hæmoglobin, granular casts, and red cells. He was symptomless, and subsequent specimens of urine were normal.

Brooks et al. (1948) reported 2 cases in which intravenous myanesin was followed by intense hæmoglobinuria. They injected myanesin intra-arterially into a paralysed but otherwise healthy arm about to be amputated, and tested venous blood before and after injection of myanesin. They found gross hæmolysis in all four samples taken after injection but none in the pre-injection sample.

Wilson and Gordon (1948) reported a series of 60 cases of appendicectomy in children given intravenous myanesin. They found no hæmolysis before induction; slight hæmolysis and a slight increase in red-cell fragility after induction; and a considerable increase in hæmolysis and in red-cell fragility after myanesin. They found no hæmoglobinuria by naked eye or spectroscopically.

Ogilvie et al. (1948) showed conclusively that myanesin had a strong hæmolytic action in vitro.

Cowen (1948) reported a case in which an intravenous dose of myanesin, followed two days later by another dose produced no urinary change, but a larger dose, given a day later still, was followed in $1^1/_2$ hours by the passage of wine-red urine containing blood pigment and one or two red cells per field. The urine was not examined spectroscopically, and two hours later was normal.

Griffith et al. (1949) stated that of 75 conscious patients given myanesin 12 subsequently had transient hæmoglobinuria.

Davison et al. (1949) treated 2 cases of tetanus with myanesin: the first patient, in whom hæmoglobinuria was not observed, received 58 ml. in 60 hours; the second patient received 265 ml. in $26^1/_2$ hours, developed hæmoglobinuria, and died two hours later. At necropsy the kidneys appeared normal to the naked eye and on section. The serum showed "little or no hæmoglobin" microscopically, but the bladder contained slightly smoky urine.

Mallinson (1948) reported that out of more than 100 cases in which myanesin had been used he had found 3 possible examples of hæmoglobinuria, but incomplete investigation did not allow of definite conclusions. In 15 other cases of his, the urine was investigated: 5 gave a positive or weak positive benzidine test for blood, 4 contained a few red cells, and 4 contained a few casts, but no iron was detected spectroscopically in any of the specimens. Mallinson brought forward evidence that myanesin increased the fragility of the red cells, and suggested that, owing to this fact, the hæmolysis obtained by Pugh and Enderby (1947) in vitro was an artefact. He also pointed out (Mallinson 1949) that fatal anuria similar to that ascribed to myanesin can occur after operations in which myanesin has not been used.

Belfrage (1947) reported that a patient with tetanus who received 78 mg. of myanesin intramuscularly in 120 hours had a diminished renal output but showed no clinical evidence of hæmolysis.

Torrens et al. (1948) did not note hæmoglobinuria or signs of hæmolysis in a tetanus patient who received 7 g. of myanesin intravenously and 15 g. intramuscularly in nine days.

Ballantine (1948) reported 76 cases in which myanesin was used but did not mention hæmolysis or hæmoglobinuria.

Musgrove (1948) reported that in 200 cases given myanesin no naked-eye hæmoglobinuria was noted.

Schlesinger et al. (1948) stated that in a large series of persons "given 2% myanesin at the rate of 30 drops a minute" no hæmoglobinuria was produced.

We report here some clinical experiments made in an attempt to clarify the situation.

CLINICAL EXPERIMENTS

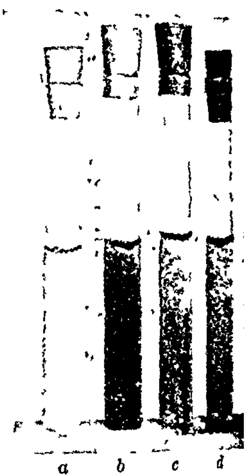
Twenty anæsthetised patients were given 1 g. myanesin dissolved in 10 ml. of solvent, as usually supplied by the makers. The myanesin solution was given intravenously at the rate of 1 ml. in 6 seconds. The premedication used was 'Omnopon' gr. $^1/_3$ and scopolamine gr. $^1/_{150}$. The anæsthetics administered, by the semi-closed method, were: (1) nitrous oxide and trichlorethylene; (2) nitrous oxide and ether; and (3) thiopentone, nitrous oxide, and trichlorethylene. The patients were all good surgical risks, all were adults, and no difficulties were met with in induction and maintenance of anæsthesia.

Four venous blood samples were taken from each patient: (1) after induction of anæsthesia but just before the injection of myanesin; (2) 10 minutes after the injection of myanesin; (3) 30 minutes after the injection; and (4) 60 minutes after the injection.

To obviate the danger of producing hæmolysis by the use of syringes, all samples were collected through a wide-bore needle with a small rubber tube attached to the hub. After the needle had been introduced, the blood was collected by gravity into clean dry bottles, which were allowed to stand until the sera separated. After the return of these patients to the ward, the first three specimens of urine voided were collected and sent to the laboratory.

As controls 10 other patients, who had received similar premedication and anæsthesia but no myanesin, were bled in a like manner and had their first three postoperative specimens of urine collected.

Blood (Hb 100–110% Haldane) was collected from one of us (J. B. P.) and heparinised with 10 I.U. per ml.; 10 ml. of this blood was then added to 90 ml. of water, producing complete hæmolysis. From this 10% solution of hæmolysed blood, standards were made as follows: 5%, 4%, 3%, 2·5%, 2%, 1·75%, 1·5%, 1·25%, 1%, 0·9%, 0·8%, 0·7%, 0·6%, 0·5%, 0·4%, 0·3%, 0·2%, and 0·1%. The sera obtained from the patients were matched with these standard tubes and a tube of unhæmolysed serum. Excellent comparison was obtained between test and standard samples, but it was sometimes difficult to express the degree of hæmolysis to the nearest 0·1%. The standard tube containing 0·1% of hæmolysed blood was just visibly pink, and any serum giving a reading less than this was considered to show no hæmolysis.



Four specimens of serum fro patient given myanesin: a, b injection of myanesin; b, 10 after injection; c, 30 minutes injection; d, 60

The specimens of urine from the 20 test patients and the 10 controls were examined for albumin, occult blood by the benzidine test, and microscopically for red cells and casts.

To estimate the delicacy of the benzidine test, hæmolysed blood (Hb 14·5 g. per 100 ml.) was added to normal urine in various proportions and subjected to the test. It was found that 14·5 mg. of Hb per 100 ml. of urine (≅0·1% of hæmolysed blood) gave a negative result, 29 mg. of Hb per 100 ml. a weak positive, and 58 Hb per 100 ml. a full positive reaction.

RESULTS

Hæmolysis.—None of the sera from the 10 pati who had not received myanesin showed any hæmoly nor did any of the samples taken from the 20 myan patients before the myanesin was given. After injection of myanesin, the sera of 18 of the 20 pati showed hæmolysis, and 2 did not. The amount of hæ lysis ranged from 2·75 to 0 2%. Usually the grea hæmolysis was obtained in the sera taken 10 min after the myanesin. (The figures for intravas hæmolysis speak for themselves.)

Urine.—The results were as follows:

	Myanesin patients (20)		*Controls* (10)	
	Positive	*Negative*	*Positive*	*Neg*
Occult blood	5	15	0	10
Red cells	4	16	0	1
Casts	18	2	3	7
Albumin (more than trace)	16	4	4	[illegible]

Of the 5 myanesin cases which had positive tests occult blood, 2 also showed red cells and casts, an casts only. All specimens of urine which gave a pos test for occult blood were turbid and browner than us Two of the 4 myanesin patients whose urines showed cells also had casts and gave a positive test for oc blood, whereas the other 2 had casts only. The diffe between the myanesin patients and the contr regards casts is highly significant, and as regards alb significant. The figures regarding occult blood and cells are not significant but are suggestive of a differe between the test and control series.

DISCUSSION

We have shown that the intravenous injection of 1 of myanesin is followed by hæmolysis in 18 out of cases. To meet the argument that this is an artefact, took all precautions to minimise trauma to the red c We did no fragility tests after myanesin, because believe that this test, which measures the o pressures in the cells in vitro, does not nece measure the fragility of the cells in their nor surroundings. The amount of trauma to which red cells were subjected in our experiments probably less than red cells experience in the body. 15 of the 18 cases showing hæmolysis this reach

aximum in 10 minutes. The evidence that some
ascular hæmolysis occurs after the clinical use of
esin is overwhelming; the real point at issue is
ler it is of sufficient degree to limit the usefulness
drug. We have not found any report of an investiga-
which correlates the degree of intravascular hæmo-
with its toxic effects: and, until more is known
this matter, it seems wisest to keep such hæmolysis
to a minimum. Our impression is that serious
s of hæmolysis are most likely to occur with the
doses of myanesin. Intravascular hæmolysis such
y follow incompatible blood-transfusion can cause
and death. Cases have been reported in which
esin was given and the patients subsequently
ped anuria, but it is still uncertain whether the
esin was to blame, because similar cases have been
ed where no myanesin had been given. Further
igations, particularly when symptoms arise, should
de and reported.

vious workers have tried to estimate the threshold
hich hæmoglobin is excreted by the kidneys.
avasquez (1940) placed the threshold between 459
82 mg. of Hb. per 100 ml. of plasma (equivalent to
3% of hæmolysed blood in a normal person). This
vorked out on a single case of paroxysmal hæmo-
uria with a urine pH of 5·5–6·3. Since none of our
its had such a high degree of hæmolysis and yet
had hæmoglobinuria, this figure for the threshold
rs to be too high. Gilligan et al. (1941), from experi-
in which hæmoglobin was injected into 10 normal
abnormal persons, concluded that the threshold
bout 135 mg. of Hb per 100 ml. of plasma. In our
of hæmoglobinuria the average maximum level of
the plasma was 202 mg. per 100 ml. of plasma,
as in those without hæmoglobinuria it was 142 mg.
presence or absence of hæmoglobinuria therefore
ly indicates the amount of intravascular hæmolysis.
possible dangers of intravascular hæmolysis, one
of which is myanesin, are anuria following renal
a, and permanent renal damage. The evidence that
esin can cause anuria is still controversial, and there
evidence that it can cause permanent renal damage,
e suggest that the drug should be used with great
n, avoiding unnecessarily large dosage and watching
th hæmolysis and hæmoglobinuria. Since the main
n seems to be borne by the kidney, myanesin
l not be given where renal function is impaired.

SUMMARY

vious work on the possibility of myanesin causing
ascular hæmolysis and hæmoglobinuria is reviewed.

sera and postoperative specimens of urine of 20
hetised patients receiving myanesin and 10 not
ing myanesin were examined.

molysis was present in 18 of the test cases, and in
of the controls.

differences in the *two* series were significant as
ls casts and albuminuria, and highly suggestive as
ls hæmoglobinuria and red cells.

is suggested that in the present state of our know-
of this drug it should be given in the smallest
ive dosage.

thanks are due to Dr. J. A. Fraser Roberts for his
st and advice.

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HYPERSPLENISM WITH ARTHRITIS

REPORT OF A CASE

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HYPERSPLENISM was first described by Wiseman and Doan (1939, 1942), who reported as a new syndrome five cases of profound neutropenia of the peripheral blood, splenomegaly, and myeloid hyperplasia of the bone-marrow. None of these cases of splenic neutropenia (the name they gave to the syndrome) showed hepatic damage such as is found in Banti's disease, and there was a complete absence of factors known to cause agranulocytosis. In all these patients the leucocyte-counts became normal after splenectomy. Further examples of the condition have since been reported by Moore and Bierbaum (1939), Muether et al. (1941), Rogers and Hall (1945), Salzer et al. (1945), Langston et al. (1945), Kinsey and Bingham (1946), McClean and Coleman (1947), Sacks and Carey (1948), and Palumbo (1949).

In most of these patients the granular white cells were predominantly affected, but in some cases the platelets and/or red cells were also slightly reduced in number. Doan and Wright (1946) recorded two cases in detail and charted the blood findings in five others in which the numbers of white cells, red cells, and platelets (especially the last two) were all very low. This condition they termed splenic panhæmatopenia, and in every case splenectomy was followed by a rapid return of the blood picture to normal. Semple (1948) described a case which differed from those reported by Doan and Wright only in the slow recovery of the red-cell count after splenectomy.

All but one of these cases have been examples of acquired primary hypersplenism. The exception is one of the cases of splenic panhæmatopenia described by Doan and Wright (1946), which they believed to be congenital. Van Creveld (1948) reported such a condition in a child aged 2 years, and this, too, probably falls into the congenital category.

That hypersplenism may be secondary to a pre-existing enlargement of the spleen is generally recognised. Wilensky (1942), Mandelbaum et al. (1942), Dameshek and Miller (1946), Davis et al. (1949), and others have described examples of thrombocytopenic purpura complicating Gaucher's disease in which the symptoms were relieved by splenectomy. Doan and Wright (1946) mentioned three patients with Hodgkin's disease—one showing severe anæmia and neutropenia, and the other two thrombocytopenia with purpura—all of whose symptoms were relieved (the first for as long as 2 years) by splenectomy. They also cited two examples of a panhæmatopenic syndrome associated with Gaucher's disease, in both of which the symptoms improved after removal of the spleen.

DR. CLENDON, DR. PENFOLD: REFERENCES—*continued*

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The association of chronic arthritis, splenomegaly, and leucopenia in middle-aged people, first described by Felty (1924), is well known. Two of Wiseman and Doan's (1942) patients gave a history of joint pains, but manifestations of rheumatoid arthritis were negligible during the neutropenic phases. The patient described by Langston et al. (1945) also had arthritic symptoms, which cleared after splenectomy, leaving only the deformities resulting from the acute stage. Smith and McCabe (1948) published two cases of splenic neutropenia with arthritis; though their first patient had a hypoplastic marrow, both showed clinical improvement with a return to normal leucocyte-counts after splenectomy.

The following case is an additional example of hypersplenism with joint changes.

CASE-RECORD

A married woman, aged 38, was admitted to the Royal Infirmary, Aberdeen, on Dec. 8, 1947, with 9 months' history of tiredness, depression, loss of weight, and worry over domestic affairs. Her relations had noted her increasing pallor. She had had no dyspeptic symptoms except anorexia, and gave no history of breathlessness, cough, or unusual loss of blood. Since the birth of her first child in 1932 she had had a vesicovaginal fistula for which she had undergone four operations in that year without relief. During the past 16 years the fistula had remained unchanged, and the continual dribbling of urine caused much discomfort. About 1934 she had developed rheumatoid arthritis affecting mainly her hands. At first this was mild, but it gradually became more incapacitating, and in 1942 the patient had a course of chrysotherapy, the dosage of which is unknown. This treatment relieved her symptoms, and for the past 5 years her rheumatoid arthritis had been quiescent. The patient's family history was irrelevant.

On examination the patient was pale, tired-looking, and febrile, with some marginal atrophy of the tongue but no glossitis and no evidence of koilonychia. Her blood-pressure was 115/70 mm. Hg, and no abnormality was detected in her chest apart from a generalised soft systolic murmur, which was attributed to her anæmia. Her spleen was uniformly enlarged and extended to about 1 cm. below the umbilicus; it was firm, bulky, and smooth, but not tender. The liver was not palpable, and there were no enlarged cervical, axillary, or inguinal lymph-nodes. Detailed neurological examination was negative. There was only minimal evidence of rheumatoid arthritis, affecting particularly the second and third metacarpophalangeal joints on both sides. The urine contained no albumin or sugar, and microscopically showed nothing abnormal.

Investigations.—The initial blood-count was: Hb 52% (Haldane), red cells 3,421,000 per c.mm., colour-index 0·76, leucocytes 800 per c.mm. (neutrophil polymorphs 17%—non-segmented 12%, segmented 5%—lymphocytes 55%, and monocytes 28%), platelets 127,500 per c.mm. The red cells were microcytic and hypochromic. Serial leucocyte-counts, hæmoglobin, and platelet-counts are charted in the accompanying figure. Reticulocyte-counts were done from time to time but were always within normal limits. The icteric index was 5, and the plasma-protein level 8·22 g. per 100 ml. Stools were examined several times for occult blood with negative results. Blood-culture was sterile, and agglutinations against *S. typhi* (O and H), *S. paratyphi-B*, and *Br. abortus* were negative. The sternal marrow was examined on three occasions over a period of weeks. The following is a representative result: myeloblasts 4%, promyelocytes 9·7%, neutrophil myelocytes 26%, eosinophil myelocytes 1%, metamyelocytes 27·1%, polymorphs 2%, lymphocytes 9·3%, plasma cells 0·3%, hæmocytoblasts 0·3%, normoblasts 20·3%.

Radiography of the chest revealed no abnormality, and a barium swallow gave no radiological evidence of œsophageal varices.

Treatment.—Penicillin 20,000 units three obviously indicated to minimise the risk of in
the neutropenia. Iron was given in th
sulph., starting with gr. 3 t.d.s. but incr
later because of lack of response. Sinc
improvement, blood-transfusions were in

Progress.—Meanwhile the
deteriorating, the fever wa
the lumbar region, buttocks

ated and extensively inflamed as a result of the leakage of urine from the vesicovaginal fistula. T count remained almost constantly below 1000 per c the Hb and red-cell count varied directly with the of blood transfused. It was therefore decided to patient to splenectomy; but, as the final preparations being made, she developed a large carbuncle on the buttock. The operation had therefore to be delayed fo months, during which penicillin and small transfusio packed cells were continued. Eventually the carbuncle h and on March 16, 1948, after a transfusion of 1 pint of blood, the spleen was removed by Mr. Andrew Fowle accessory spleens were found at operation, and the liv normal in appearance and consistence.

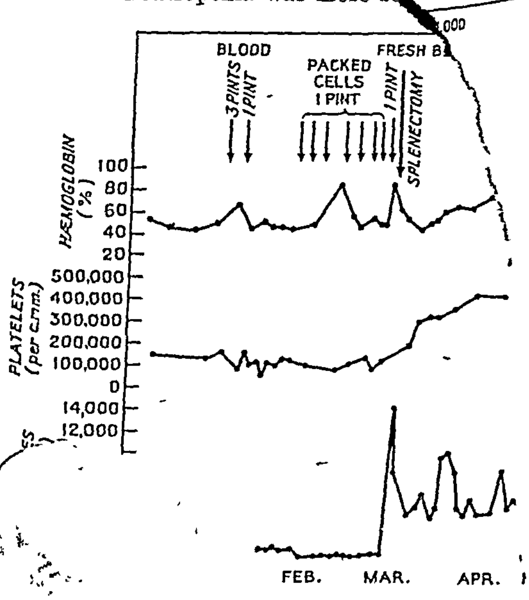
Postoperative Progress.—The patient's convalescenc surprisingly smooth. The wound healed by first inte and the excoriated areas epithelised very quickly. (twelfth postoperative day, however, the patient devel left basal pneumonia; so penicillin, which had been st after the operation, was again given, and the pneu resolved within a week. Thereafter the patient im rapidly and was discharged to her home on May 4, 194

Follow-up.—Since that time the patient has been regular intervals. Her general condition has improved and she has regained all her lost weight. Her blood h invariably within normal limits and the most recent on Sept. 3, 1949, seventeen months after the ope showed Hb 110%, red cells 5,230,000 per c.mm., colour 1·05, leucocytes 9600 per c.mm. (neutrophil poly 60%—non-segmented 4%, segmented 56%—eosinophi lymphocytes 31%, monocytes 8%), and platelets per c.mm. In March, 1949, her rheumatoid arthritis fla The affected joints included the second metacarpopha on both sides, the left elbow, and both knees, but with therapy they have made satisfactory progress. In July the patient was successfully treated by her doctor in h home for pneumonia, and her chest is now clinical radiologically clear.

Pathology of Spleen (Dr. C. E. Lumsden).—The weighed 1450 g. Histologically there was nothing pat monic. The pulp was congested but showed no ab infiltration or fibrosis. The malpighian bodies, ho were enlarged owing to hyperplasia of the reticulum There was moderately severe hæmosiderosis, and th contained nuc lear detritus, but no erythrophagocyt leucophagocytosis was found.

DISCUSSION

in general the clinical re
The present case fulfils differs from the pan
ments of hypersplenism and d Wright (1946) o
topenic syndrome of Doan an vere than the a
that the neutropenia was more s



treated by splenectomy

ombocytopenia. A normal peripheral blood picture
ablished rapidly after splenectomy, though the
in the red cells and platelets was not so dramatic
esponse of the neutrophils.

nesis

result of splenectomy favours the view that
dysfunction is at least partly responsible for
dition: but the exact mechanism is not clear.
n and Doan (1942), Moore and Bierbaum (1939),
r et al. (1941), Doan and Wright (1946), and
o (1949) found histological evidence of excessive
ion of the affected elements in the spleen, and
e that hypersplenism is a pathological accentua-
the normal physiological phagocytic function of
en for disposal of blood-cells. On the other hand
ndings have not been constant, and Rogers and
945), Dameshek (1946), Kinsey and Bingham
Semple (1948), and Smith and McCabe (1948)
that the spleen produces an inhibitory factor
revents either the maturation of the marrow cells
liberation into the peripheral blood.

gh there was some enlargement of the malpighian
wing to hyperplasia of the reticulum cells in the
case, no phagocytosis was observed. This fact
e lends support to those who believe that the
in such cases exerts an inhibitory effect on the
. It must be remembered, as Moore and Bierbaum
and Wiseman and Doan (1942) pointed out,
hereas this abnormal phagocytosis is very obvious
supravital preparations, it may be difficult to
n cut sections of the spleen. It must be emphasised
pravital staining was not done in the present

aps the solution lies in a combination of these
ews—i.e., a splenic factor prevents maturation
affected elements, which as a result of their
rity are readily destroyed by the reticulo-
elial system in the spleen and elsewhere.

tion of Arthritis and Hypersplenism

he 5 cases reported by Felty (1924) all showed
erate leucopenia, but in no instance was it as
as in the 2 cases described by Wiseman and Doan
or in the present case, in all of whom, in further
listinction to Felty's cases, the rheumatoid
is was trivial during the neutropenic phases.
ointed out that his syndrome might well represent
disease with a coincidental arthritis, though he
d it was a distinct clinical entity. Hanrahan and
(1932) reported a case of Felty's syndrome in
the symptoms improved as a result of splenectomy
d out primarily to relieve the discomfort caused
plenic enlargement. The sternal marrow was not,
e, examined in their case, but the leucopenia was
vere than in Felty's cases and was of the same
s that found by Wiseman and Doan (1942).
s (1936), reporting a case of Felty's syndrome,
d that it was a primary blood disorder in which
turation of the granular cells was arrested.
of the bone-marrow at necropsy, however,
d diminished myeloid activity, and this case
e parallels more closely the first case reported
th and McCabe (1948). Steinberg (1942) noted
first time marrow hyperplasia in 2 cases of Felty's
ne and postulated that the spleen might be
ng the maturation of neutrophil cells. He held
f the marrow is not hyperplastic, splenectomy
not be done in these cases. Dameshek (1944)
d that Felty's syndrome was a form of splenic
enia brought about by splenic involvement in
ctious or toxic process of rheumatoid arthritis.

e present case there was a relapse of the arthritis
a year of splenectomy. The published follow-up periods of all the other cases have been very short, so the ultimate effect of splenectomy on the joint manifestations cannot be assessed. Symptomatically Felty's syndrome and hypersplenism are closely related, but it is difficult to be certain whether they have a similar ætiology, since the clinical information on the reported cases has often been inadequate. Time may show that the association of arthritis with hypersplenism is purely fortuitous, but at present it cannot be dismissed as such.

SUMMARY

A case of hypersplenism with rheumatoid arthritis is presented.

The ætiology of this condition and its association with Felty's syndrome are discussed.

I wish to thank Prof. H. W. Fullerton for permission to publish this case, and Dr. C. E. Lumsden for the pathological report on the spleen.

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HYDROCOLPOS

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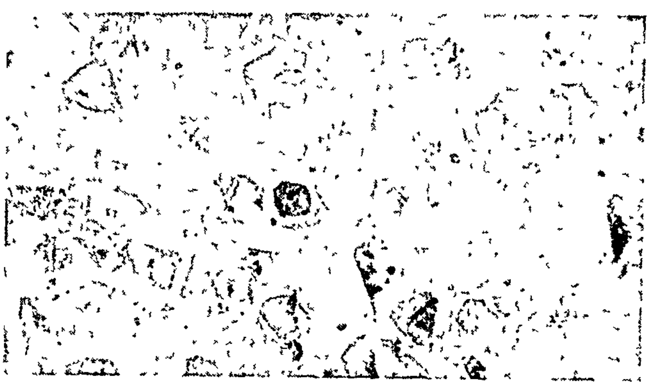
HYDROCOLPOS is a rare condition in which fluid other than blood has accumulated in a vagina occluded by an imperforate hymen, a retrohymenal membrane, or atresia. It is usually discovered either shortly after birth or just before puberty. Eleven cases have so far been reported, and eight of these belonged to the neonatal group.

Spencer (1916) described the first case; Mahoney and Chamberlain (1940) described four cases; and one case each has been described by Kereszturi (1940), Bowen (1941), Althoff (1941), Rosenblatt and Woolley (1943), Morris (1945), and Maliphant (1948). The age-incidence in these cases ranged from one day to eleven weeks in the neonatal group and from twelve to fourteen years in the prepubertal group, in which two girls had their normal periods five months after hydrocolpos was detected.

The fluid has been variously described, according to its naked-eye appearance. Thus it may be "turbid serous," "mucoid," "milky," and "chylous," perhaps depending on relative contributions of the various parts of the female genital tract (see below).



Smear of hydrocolpos fluid, showing desquamated vaginal epithelium in various stages of maturity, but no organisms. (Gram's stain.)

CASE-RECORD

An infant, aged 4 days, was admitted with intestinal obstruction due to imperforate anus and was operated on. During the operation it was noticed that the hymen was intact and bulged when the baby strained. Nothing was done at that time for this condition. The baby left the hospital on the 16th day, with advice that she should be brought back for dilatation of the anal canal.

On the 24th day she was readmitted, with excessive vomiting and scanty urine. She was dehydrated, with her skin inelastic and shrivelled. A fusiform swelling with a knob-like structure at its top was felt in the hypogastric region. The urinary bladder was emptied with a fine catheter, 4 ml. of urine being obtained. As the baby was crying at this time, the hymen was found to be bulging. The mass in the hypogastric region was still there. Rectal examination revealed a slightly fluctuant cystic mass in front, partly filling the pelvic cavity.

The hymen was punctured, about 32 ml. of milk-like white thick fluid was withdrawn from the vagina, and the swelling completely disappeared. The hymen was opened with a cruciate incision. The baby was treated for vomiting and left the hospital after a few days.

The fluid had a pH of 6·4. On standing for 24 hours, scanty clear supernatant fluid separated, and the deposit occupied about 98% of the total fluid. On staining, it was found to be full of desquamated vaginal epithelium in various stages of maturity (see figure) and containing various amounts of glycogen. Polymorphonuclear leucocytes were seen but no organisms were detected. The protein content of the fluid was 0·62%, but no fat-globules were seen. The fluid was sterile on culture.

DISCUSSION

Source of Fluid

Presumably every part of the female genital tract contributes to this fluid. Mahoney and Chamberlain (1940) described the morbid histology in this condition in necropsy and operation specimens. They found distinct evidence of activity in the uterine glands and the vaginal epithelium, which was thick and many-layered, keratinised, and loaded with glycogen. Similar activity of the female genital tract is not uncommon in the neonatal period, and slight bleeding or mucoid discharge per vaginam during the first two weeks of life is often met with in obstetric practice. Since in the present case the fluid was made up almost entirely of desquamated vaginal epithelium, whose pH was slightly on the acid side, the vagina seems to have contributed the most.

Pathogenesis

Both in utero and for about two weeks after birth (Dobszay 1938) the female child is under the influence of maternal œstrogens. The uterus and the cervix grow, and there is evidence of increased activity of the uterine and cervical glands during this period. The vagina assumes the adult type, and its epithelium becomes thick, keratinised, and loaded with glycogen. Its secretion becomes acid. Similar activity is also during the prepubertal period under the influ gonadal hormones secreted from the ovaries at thi It is precisely at these two age-periods that hydr is met with.

The fact that the fluid may vary is due to the u cervix, and vagina reacting differently accordi their states of sensitivity towards the hormones thus contributing different shares.

The endometrium has two functional part blood-vessels and its glands. These react independ to the œstrogens, but because they work simultane and usually uniformly their individuality is mask most cases. Sometimes one may act without other. Markee (1936), Daron (1936), Kaiser (1948 Bartelmez (cited by Markee 1936) have proved th vascular system of the endometrium is responsib menstrual bleeding, and where this system doe react to œstrogens there may not be any ble though the glands may react and secrete. Th nature of the discharge from the uterus depends reactivity of the individual parts of the endome towards gonadal hormones. Similar factors also dete the secretion from the cervix and changes in the v epithelium. According to the various proportio secretions from the uterus, the cervix, and the v the physical and chemical nature of hydrocolpos will vary. The fluid in the present case was aci it was sterile on culture and no organism was on staining. This is of interest because it show the presence of Döderlein's bacillus is not essent make the vaginal fluid acid.

Pathology

Besides the activity of the uterine and cervical and changes in the vagina and accumulation of fl it, the amount of which varies from 1 drachm to s ounces in neonatal period and from 0 85 to 2 27 in the prepubertal period, accumulation of fluid extend by regurgitation into the uterine cavity (1945)—a condition known as hydrometrocolpos.

The pressure of the fluid may cause stretching elongation of the urethra and the neck of the bla The bladder is pushed upwards and forwards. ureters may be obstructed at the ureterovesical jun and there may be bilateral hydronephrosis (Morris Kereszturi 1940). Infection may supervene on condition, causing pyelonephritis (Kereszturi 1940). colon may be displaced upwards, and there ma intestinal obstruction, sometimes due to an imperf anus caused by failure of the process of canali similar to atresia of the vagina or imperforate hymenal membrane or hymen. Pressure on the may cause œdema of the lower half of the (Morris 1945).

Clinical Features

Symptoms may be alarming within two days birth. Retention of urine was urgent in six out of e cases reported. "Abdominal tumour" was prese eight out of eleven cases, in five of which laparo was done to remove it. Intestinal obstruction was f in two children whose condition was serious, one of dying on the first day of life, and the other having ext pressure symptoms. Swelling at the vulva was sec one case and was due to a bulging hymen. Back and abdominal pain were met with in the prepub age-group.

Most of these conditions were due to pressure o accumulated fluid on the surrounding structures.

Signs

(1) Swelling in the hypogastric region, arising Re the pelvis and filling it in various degrees. examination reveals a distended vagina in front, c

ıctuant to palpation. The swelling does not ıar after catheterisation. (2) Inspection of the ɾill reveal occlusion of the lower end of the vagina, nay bulge on straining in the case of imperforate or retrohymenal membrane. There may be ted imperforate anus. (3) Puncture of the occluding ane in the lower part of the vagina will tap the eristic fluid. Its withdrawal will cause disappear- the swelling. (4) Radiography after introduc- a radio-opaque medium into the fluid in the will reveal the distended condition of the vagina ır without associated distension of the uterine bladder. Catheterisation will eliminate a distended bladder. Inspection of the vulva is extremely important, along with other measures, such as rectal examination and puncture of the occluding membrane in the lower part of the vagina.

sis

ırly cases the prognosis is good. In late cases, larly in the presence of complications, the prog- very much worse. Pressure symptoms may be larly serious in infants and may cause death. olpos may cause serious damage to the female tract.

ıtial Diagnosis

condition should be differentiated from hæmato- ınd from other neonatal and prepubertal swellings ypogastric region—e.g., urachal cyst and distended

Treatment

This is simple where the occlusion is due to an imperforate hymen or retrohymenal membrane. In these cases a cruciate incision or excision of the hymen and drainage of the fluid are enough. Where the occlusion is due to atresia of the lower vaginal canal some sort of plastic operation may have to be undertaken at the appropriate age.

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Preliminary Communication

ECT OF COMBINED INJECTIONS OF YCORTONE ACETATE AND ASCORBIC CID ON RHEUMATOID ARTHRITIS

and more attention has been given during years to the therapeutic effect of hormones from ophysis and adrenal cortex, especially in rheuma- thritis. Two Swedish workers [1] showed that the tation of calf hypophysis in a case of severe toid arthritis caused the disease to take a more ble course. The important American research ain hormones from the hypophysis (A.C.T.H.) [2, 5] renal cortex (Compound E) [3, 4, 5] and their effect ımatoid arthritis has been a great incitement to h in this field.

ollowing is a preliminary report of an investigation effect of combined injections of desoxycorti- ne acetate and ascorbic acid on rheumatoid s.

series comprises 9 patients (6 women and 3 men) oth mild and severe rheumatic disease of the of two weeks' to fifteen years' standing.

he suggestion of one of us (E. L.) the patients eated with an intramuscular injection of 5 mg. ortone (desoxycorticosterone) acetate in 1 ml. of ırachis, immediately followed by an intravenous n of 1 g. ascorbic acid (10 ml. of 10% solution). ninutes after the injections the articular pain to diminish and the articular mobility began ease. Fifteen to thirty minutes later, the pain actically disappeared and the mobility improved h as the anatomical changes in the joints and ar atrophy would allow. All the patients reacted milar way. In some cases the improvement was ding. One of the patients was completely crippled by pain and contractures after rheumatoid arthritis for fifteen years: after *one* combined injection, she sat up with ease and moved her arms and legs about freely; all her pain had gone. It was noted that the skin became warmer and redder in the articular regions after the injection. Some patients became greatly exhilarated after the injections—more than one would expect from the mere relief of pain.

The effect lasted from two to six hours, occasionally more than twenty-four hours. It seems as though it lasts longer with each further injection. In more acute cases one or two injections have been enough to banish the pain for two or three weeks (the present observation time).

We have not yet worked out the most suitable dosage. Doses exceeding 5 mg. of desoxycorticosterone acetate and/or 1 g. of ascorbic acid do not enhance the effect. On the other hand, half these amounts seems to be equally effective. The ascorbic acid can also be given intramuscularly, but no effect has been observed after oral administration. As a rule we have waited two to five minutes between the injections. If we waited two hours we got no effect. In one case relief has been obtained for four days (at the time of writing) by the intramuscular implantation of one tablet of 100 mg. of desoxycorticosterone acetate followed by injections of 0 5 g. of ascorbic acid every sixth to eighth hour.

As far as we can determine, the pain-relieving effect is confined to the joints and adjacent regions. In cases of sciatica, myeloma, and wound and muscular pains no alleviation of the pains was observed.

As yet we have not seen any toxic side-effects after the injections. No changes in the blood-pressure have been noted, nor any mentionable effect on sodium chloride or potassium in the blood. In some cases a drop in the sedimentation-rate of the red blood cells was observed.

Further work is being done along these lines so as to ascertain how far the effects described are obtainable in different types of arthritis or other conditions, and whether the observations can lead to a therapy of these diseases.

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Medical Societies

MANCHESTER MEDICAL SOCIETY

Diagnosis and Treatment of Epilepsy

ADDRESSING the Manchester Medical Society on Nov. 2, Prof. F. J. NATTRASS said that the diagnosis of epilepsy depends essentially upon accurate history-taking backed by knowledge of the varied manifestations of this disease. The electroencephalogram (E.E.G.) shows, as Hughlings Jackson postulated on clinical grounds, that epileptic attacks are accompanied by outbursts of abnormal activity in the cerebral cortex; it is still doubtful whether epileptic discharges arise in any other part of the brain. The disturbance may be localised and result only in involuntary movements or abnormal sensations on one side of the body; this is the simplest type of attack—local or jacksonian epilepsy. When the discharges are widespread throughout the cortex consciousness is affected, and if there are movements they are generalised; but movements may be absent.

In diagnosis mistakes are made particularly in respect of petit mal, and from the point of view of treatment *this title should be restricted and not applied to* any type of seizure of short duration. Another frequent cause of difficulty is the variability of the major (grand mal) type of seizure, which may be incomplete, ending with the tonic stage or with only mild convulsive movements. In diagnosis the aims should be: (1) the recognition of attacks as epileptic; (2) localisation of the areas in which the disturbance arises; and determination of the cause of attacks. As to the *aim*, distinction from syncope is the commones which may be difficult for two main reasons: people predisposed to fainting the stimulus may be slight; and (*b*) during syncope there may be fairly marked convulsive movements. There is less di in distinguishing between epilepsy and hysteria, ver *narcolepsy, and other attacks.*

While epilepsy in adults is more likely to be du organic disease, and especially cerebral tumour, th the case in childhood, nevertheless pure or idiop epilepsy begins in late life much more than is us believed. Of 1000 epileptics, 17% said that their fits occurred after the age of 40. Of 100 cases onset after the age of 40 which were followed up periods varying from 3 to 18 years, 75 were surv without any symptom or sign of intracranial tum of the 25 deaths, 10 were due to intracranial tun and 5 to cerebral arteriosclerosis.

In treatment the difference between success and fa may depend on the choice of drug, on adequate do and on prolonged trial. In the treatment of n epilepsy Professor Nattrass prefers phenytoin sodiu phenobarbitone, especially for young patients, th administration of this drug requires careful observa 'Tridione' should be used if the diagnosis of petit is certain and attacks frequent; and total and differe white-cell counts should be done every three weeks

Professor Nattrass concluded with a plea for coöperation of those in medical charge of the patien finding suitable employment for epileptics.

Reviews of Books

Nervous and Neurohumoral Regulation of Intestinal Motility

W. B. YOUMANS, professor of physiology, University of Oregon. New York and London: Interscience Publishers. 1949. Pp. 129. 29*s*.

Professor Youmans begins his monograph with a critical account of the terminology used to describe the visceral nervous system. He writes: "The earlier concept that the sympathetic and parasympathetic systems are antagonistic or reciprocally acting systems is an oversimplification." He further points out that smooth muscle is not a "biologic unity." The book contains an account of the ingenious double-pouch method for investigating the influence of the various anatomical components of the visceral nervous system on the intestine, the effect of denervation on the reactivity of the gut to adrenaline, and the reflex influence of stimulation of the peritoneum, urinary bladder, and gall-bladder on the motility of the gut. It is almost entirely devoted to the results of experiments in animals, with little discussion of their clinical relevance.

Neuroradiology

ALEXANDER ORLEY, M.D., F.F.R., D.M.R. & E., consulting radiologist to West End Hospital for Nervous Diseases, London. Oxford: Blackwell Scientific Publications. 1949. Pp. 421. 63*s*.

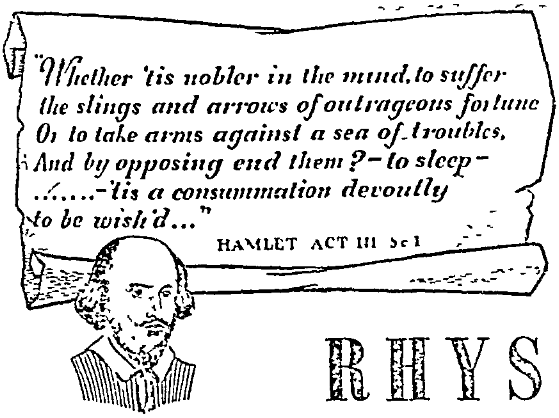
IT is sometimes said that the commonest fault of medical textbooks is that they are always several years behind current thought and methods. Dr. Orley's book suffers somewhat from this disadvantage, for it is largely based on the clinical material he collected during the 1939–45 war. In 1945 liaison with the Swedish neuroradiological school, founded by Lysholm, was renewed; and since then technique in ventriculography, and more particularly in angiography of the cerebrum, has vastly altered. The section in this book on ventriculography is to some extent outmoded, adhering too much to the old standard projections, with their emphasis upon lateral views for the filling of each lateral ventricle in turn; and so is the section on cerebral angiography, where no substance other than a radioactive preparation is suggested as a contrast medium, and the percutaneous route of injection is mentioned only to be decried. (In neurosurgical clinics in the British Isles, the percutaneous route is now being regularly used for the injection of non-radioactive substances for cerebral angiograp Such objections, however, do not apply to the sect on the technique of radiography of the skull, which clearly written and well and ingeniously illustra and those on the spine give a good general vie spinal lesions. The section on myelography is too giving no indication of the normal and its variat for comparison with the few gross lesions illustr The heading "lumbar encephalography" p very sketchy description of the technique of mye and some of the statements about cisternal myel are questionable. The bibliography is excellent the student of neurological radiology it references fully cross-indexed.

The Common Form of Joint Dysfunction: Treatment and Incidence

WILLIAM KAUFMAN, PH.D., M.D. Vermont: E Hildreth. 1949. Pp. 208.

WITH disarming candour, the author of this monog on the treatment of rheumatoid arthritis with niacina (nicotinamide) admits that few of his many exem cases were radiographed or had any but the perfunctory laboratory investigations, and that no co series was studied; so his assessment of recover failure from a "joint range index" (a figure obt from the mean of 20 joint ranges measured by a g meter, a notoriously unreliable instrument) mu regarded sceptically. Moreover, many of the case "subclinical," in that a diminished "joint range ind was found only when the patient presented himsel "check-up examination" without any though symptom of "rheumatism" until it was revealed to Climatic, psychological, and natural remissions pla big a part in this tragic disease for the most w thinker to be impressed by this book.

Plaster of Paris Technique (2nd ed. London: Ba Tindall, and Cox. 1948. Pp. 220. 16*s*. 6*d*.).—Practice can make a plaster technician, but a "*pattern book*" great value to the tyro; and this little American w beautifully illustrated, supplies a great deal that other books lack. As well as dealing with the elements subject, Prof. Edwin O. Geckeler describes in great the various types of plaster *splints, and the best* m of making them. In other chapters he describes more uses—the turnbuckle and *Winnett Orr plasters*, for in —and finally, gives helpful advice on the care of the p in plaster. Excellent *photographs form a large* part book.



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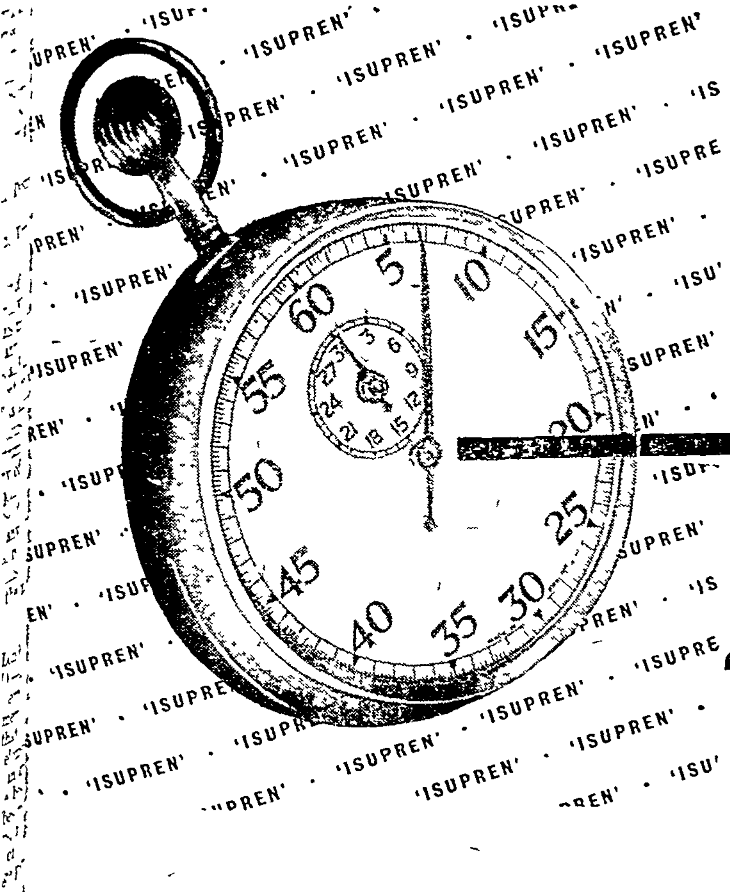

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THE LANCET

LONDON: SATURDAY, NOV. 26, 1949

The Practitioner's Remuneration

the negotiations between the Ministry of Health the General Medical Services Committee. two s have been separated: (1) the size of the total to be devoted to paying general practitioners, (2) the manner of its distribution. The recent al Conference of Local Medical Committees, gh it recognised that the questions of distribution need further consideration, pressed the Minister to an early decision about the total. The committee presented him with a document arguing that um originally calculated in Whitehall fell short e amount really required—partly because more ipals have joined the service than was expected. nore importantly because the change in the value oney has made the Ministry's betterment factor alistic. Estimated on gross income this factor sented an increase of about 34% over 1939; and locument contended that it should have been at 70%. On this basis it was claimed that the money required for adequate remuneration was million, and the amount actually being received said to be short of this by some £16·5 million. is £16·5 million were used solely for increasing capitation fee for the first 1000 patients on a ipal's list. many of the serious problems arising the National Health Service Act would. it was sted, be largely solved.

e Minister has now. as requested, given his er on the question of the total sum; but the r to the General Medical Services Committee 1005) concludes that "no reasonable case can ade for any increase in the total remuneration eneral practitioners, nor any argument sub- iated to show that general practitioners as a p are inadequately paid." On examining the ences in interpretation placed on the figures he Ministry and by the G.M.S. Committee it is rent that the Ministry has corrected the com- ee's estimate by adding to it all the other items ncome reaching general practitioners from the equer. These cover moneys paid them for rnity services, for the provision of drugs, for rtaking duties in the supplementary ophthalmic ce, and for work in cottage hospitals. Also ded are the sums set aside for additional mileage ey, inducement payments, payment for training tants, and Government contributions to super- ation. These items come to £7·5 million and are rded as a national contribution towards raising practitioner's income. The Ministry also dis- s that the number of principals in the service 8,936, whereas the G.M.S. Committee's estimate ed on earlier official figures) was about 20,000. alculating the committee's own figures on the s of this smaller number of principals, and using betterment figure of 70% suggested by the com- ee—which, significantly, he neither accepts nor repudiates—the Minister believes that the total sum required to satisfy the committee's case would be £53·5 million. The difference between this and the £48·8 million he is already providing is £4·7 million. which he does not propose to grant. Primarily, he says, he reaches his decision "upon the sheer merits of the case, as revealed by the plain figures and facts as they stand." It is only secondarily that he mentions that "the proposals have to be seen also against the background of the general economic situation, and the vital national need to avoid any unjustified raising of remuneration in any field."

Doctors are very conscious of the difficulties of the economic situation today. But, as they see it, the claim they are putting forward is not a claim for an increase of present remuneration, but rather a claim for the settlement of terms left over for discussion because there was no time for detailed agreement before the appointed day. Had the Minister admitted some validity in their claim and based a regretful refusal on the financial difficulties of the country his message might have deserved a sympathetic reception. Indeed. suggestions had already been made whereby the immediate payment of extra millions of money might have been avoided. and any additional remuneration agreed on would, for instance, have been added to the superannuation credits of the profession. With the help of even a deferred payment of this type the G.M.S. Committee would have been able to proceed with some of those adjustments of distribution which are admittedly needed. But his uncompromising reply makes these adjustments far more difficult. The immediate problems are the difficulty of the young doctor in finding a place to start practice, the lack of opportunity for assistants to become principals, the real hardship felt by doctors in areas where practices are small and must remain small, and the premium placed on large lists and hurried work. All these grave faults of N.H.S. general practice could be partially repaired by the graded capitation fee. and by no other measure likely to command equally wide acceptance. It is true that THE LANCET, three years ago,[1] argued against the graded capitation fee; but we did so at a time when it was expected that there would be a universal basic salary of appreciable size, and when it was not supposed that the permitted maximum number of patients would be as high as 4000. Had these anticipations been fulfilled, many of the present difficulties would never have arisen. But the graded fee could still remedy the situation. Had the Minister even suggested providing the £4·7 million by which present remuneration falls short of his recalculation of the G.M.S. Committee's total a basis for rearrangement would have remained.

His present attitude can but alienate practitioners still further. Many of them were persuaded to enter the service on the understanding that the suggested pool of money provided was but an interim payment made to allow proper discussion of terms with their representatives in the light of the Spens promises. with full weight given to changing money values. They believed they had found in the Spens proposals a new and an agreed approach to equitable terms. Instead they are now met with the Minister's blunt refusal to depart from the basis for their remuneration which he himself originally laid down without consultation. Their consultant colleagues have at least had the advantage not only of a later and wiser Spens Committee but also of a period of negotiation and discussion before the range of their remuneration was settled. Perhaps the present experience of the general practitioners will give salutary warning to those in the consultant field who seek revision of the system of distinction awards. The too evident difficulty, in present circumstances, of establishing any new claim makes it unlikely that, even if some better way of paying consultants were devised, the Government would now endow it with the money they have promised for the awards.

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[1] *Lancet*, 1946, i, 656.

Electrophysiology of the Mind

IN the controversies between mechanists and vitalists at the turn of the century, the apparently "purposive" behaviour of inanimate models was used as an argument in favour of mechanism. One popular analogy was that between the behaviour of a drop of chloroform brought into contact with a small glass thread coated with shellac, and an amœba engulfing some non-nutrient particle soaked in "food." In each case the particle was drawn into the drop or amœba, some portion of it removed, and the rest extruded. The action in the first case was purely physicochemical; how then in the second case could it be purposive? The analogy was crude and doubtless caused little heart-searching to the convinced vitalist, but it illustrated a fundamental point—that "purpose" and "teleology" were in the interpretations of the observer and not in the act observed. Nowadays the constructed model which mimics purposive behaviour has become vastly more complex and accomplished, and the arguments of the mechanist more sophisticated and to some more convincing. Indeed, the neomechanist would probably repudiate the very name, deny the validity of a vitalist-mechanist controversy, and argue that all he does is to point out how much of apparently "vital" and even "mental" behaviour can be executed by a machine. WIENER[1] in his book on cybernetics is careful to emphasise analogy, not homology, when discussing the possible similarities between an electronic calculating machine and the human brain; and in his Maudsley lecture this month Mr. GREY WALTER, SC.D., while owning that he "veers a little toward . . . the cybernetic discipline," specifically disclaimed it as anything more than operational analogy. Nevertheless, that "gentle pushing" towards a mechanistic interpretation of behaviour which JEFFERSON[2] noted in his Lister oration is quite evident. Whether or not we welcome such a *Weltanschauung*, the facts which workers like GREY WALTER are collecting on the interrelation of mind and brain are important and fascinating.

In his lecture GREY WALTER reviewed some of the findings and conclusions from his work on the electroencephalogram (E.E.G.). Clinical electroencephalography dates from BERGER's description, over twenty years ago, of the recording of an electrical rhythm, with a frequency of 8–12 cycles per second (c.p.s.) from the occipital region. The rhythm was in some way with vision, for it could be " to a different frequency by making the subject at a flickering light. Part of this "Berger has subsequently become familiar as the alpha rhyt which, as GREY WALTER has shown, is not a unit wave but made up of two or three components, ea with a frequency of 8–13 c.p.s. Moreover, he gone some way towards giving it a precise functi in cerebral economy. The rhythm is most pronoun with the eyes closed or when nothing particular happening in the field of vision; and it can be block by opening the eyes or focusing them on some obje GREY WALTER has further shown that in peo who use visual imagery in their thinking the rhyth is complex and variable, while in others it is simp and more stereotyped. From this, and from t analogy of an electronic model constructed to respo by movements to various visual stimuli, he that the alpha rhythm acts as a "scanning me nism" for all visual stimuli reaching the cortex; this mechanism presumably responds both to " nal" visual perceptions and to "internal" imagery. How then are "real" and "imaginar visions differentiated? The suggested answer ingenious. When a visual stimulus such as a brig light is presented, not only is alpha rhythm blocked b a small immediate electrical response is evoked in t occipital region. This "elementary evoked respons is sometimes unusually small or distorted, especia in those with visual hallucinations; and GR WALTER suggests that this evoked response lab the visual stimulus as "real" for the cortex, a thus allows it to be distinguished from an "imaginar or "thought" one.

The further investigation of the evoked respo itself has also proved fruitful. When subjects we exposed to a flickering light, they sometimes describ curious non-visual sensations, and E.E.G. recordin showed that in these cases areas of brain distant fro the occipital region were being activated at t stimulus-frequency or some multiple of it; and t site and amplitude of this activation was clea influenced by the subject's mental state. In o example a stimulus at 12 c.p.s. evoked a respo at the same frequency in the occipital region, w one of 6 c.p.s. (theta rhythm) in the temporal regio and of 24 c.p.s. in the frontal region. The tempo response seemed to be associated with emotional up and the frontal response with the intellectual anal of the visual patterns provoked by the stimul In each case the amplitude of activated respo was enlarged when the subject tried to adopt t emotional or intellectual attitude associated with t secondarily activated response; and the subject spontaneous mood seemed to play a similar part influencing these activated rhythms. The applicati of this light-stimulus technique to epileptics al provided data of interest. In some cases, especial when theta-frequency *activation* of temporal regio occurred, the subject complained of a feeling simil to the aura of his epileptic attack. Moreover, th interplay of emotional and physical factors in th genesis of an attack was sometimes clearly revealed in one case the voltage of the theta response to ligh could be doubled simply by making the psychologic environment less pleasant. A careful analysis of a e activated responses shows that they almost ainly occur together with, or on top of, a natural rent rhythm of the area activated. What is the tion of these inherent rhythms ? GREY WALTER gests that in some instances they are the electrical ction of an elaborate thought process. This view upported by the mental accompaniment—similar ach occasion for any individual—of theta activity, the tendency for the E.E.G. to take one standard tern for half a second or so before a given voluntary vement. A further possible function is that of age or memory. There is as yet no direct evidence this, but the analogy of electronic models suggests " rhythmic oscillation between cerebral elements physical basis for short-term memory is a fertile king hypothesis " ; and some slight support for is gained from the constant evocation of the same tional state when a stereotyped temporal theta thm is induced. The suggestion is in line with CHIE RUSSELL's conception of the physiological is of memory, derived from its disturbances in unds of the brain.

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[1] Wiener, N. Cybernetics, or Control and Communication in the Animal and the Machine. New York, 1948.

[2] Jefferson, G. *Brit. med. J.* 1949, i, 1105. See *Lancet*, 1949, i, 1058.

he increasingly clear reflection of brain function a whole in electrical rhythms will ultimately have be interpreted in terms of nerve-cell physiology. eady some direct correlations between electrical thms and mental states have been recognised ; l the fundamental contribution of GREY WALTER l many others similarly engaged has been to nonstrate one or two examples and so to point way to more. The findings in this field indicate e again integrative action at work in the nervous tem. They touch no more directly on the problem the liaison between the physical and psychical n does any other physiological inquiry into brain ction. The time has now come when both philosophy d medicine are likely to benefit from a thorough d critical consideration by philosophers—especially thaps those of the logical-positivist school—of the ts established by E.E.G. and similar investigations. e pruning of some of the luxuriant growth of eudophilosophical " interpretation " is likely to be e valuable outcome. It is perhaps a reflection of e fragmentation of our present intellectual life at no such detailed-critical evaluation has yet been ide, though the recent broadcast programme on e physical basis of mind suggests a beginning. me will find themselves drawn to a monism either mind or matter, but many will be content for the ment to agree with SHERRINGTON : " That our ing should consist of two fundamental elements ers, I suppose, no greater inherent improbability an that it should rest on one only."

Ætiology of Peptic Ulcer

THEORIES of peptic ulceration inevitably centre und two possibilities. The digestive power of the astric contents may be so increased as to corrode ealthy mucosa ; or the mucosa may be damaged n one or other of a variety of ways so that it cannot esist average concentrations of hydrochloric acid nd pepsin. Morbid anatomists and animal experimenters often apply Occam's razor and assume that ll peptic ulcers are formed by the same mechanism. Students of living patients are more cautious. Hypersecretion hypotheses do not explain many anomalies in the age, sex, and site distributions of ulcers ; and from analogy with other tissues it seems unlikely that a mucosal *locus minoris resistentiæ* should always arise from the same cause. Lately JAMES and PICKERING[1] have measured the pH of samples withdrawn from the stomach every half-hour in the day and hourly at night and have demonstrated striking differences in the curves of gastric acidity of patients with duodenal ulcer and those with gastric ulcer. In duodenal ulcer the mean minimum acidity reached in the 24 hours was more acid than normal, the duration of high acidities ($>$pH 2) was increased, and higher acidities were maintained at night after food had left the stomach. In gastric ulcer the duration of high acidities ($>$ pH 2) was normal, the duration of low acidities ($<$ pH 5·5) was increased, and many of the patients showed long periods of anacidity at night, due to cessation of gastric secretion. The evidence is interpreted as consistent with the view that duodenal ulcers are caused by abnormal acidity acting for abnormally long periods, but inconsistent with the view that gastric ulcers are produced in the same way.

In English and American medicine, the difficulties of hypersecretion hypotheses are not so widely known as they should be. In German medicine, on the other hand, since the VIRCHOW-GUNZBERG controversy of 1852, probably no serious research-worker has supported the thesis that excess of acid and pepsin is the main cause of the common peptic ulcer.[2] The nearest approach to natural hypersecretion is produced by sham-feeding an œsophagotomised dog. Maximal amounts of potent vagal secretion can be produced in this way, and yet, so long as the animal is kept in good general health, neither the duodenal nor the gastric mucosa is damaged. In man a duodenal ulcer is sometimes associated with vigorous acid secretion which persists day and night for weeks on end, and which is apparently almost maximal since there is little increase after histamine. Serious gastric ulcers, however, hardly ever form during these phases. and gastrectomy specimens often show a healthy mucosa. If a biopsy is done through a gastroscope, the resulting acute ulcer tends to heal as quickly in a patient with hyperacidity as it does in a patient with addisonian anæmia and achlorhydria. Further, it is not uncommon for a large gastric ulcer to form in a duodenal-ulcer patient after the age of forty, when acid secretion is tending to fall and possibly the duodenal ulcer is healing.

There is in fact plenty of animal and clinical evidence that large amounts of secretion usually fail to ulcerate the stomach, although even small amounts can ulcerate the œsophagus and jejunum. The controversial question is whether excessive amounts of secretion will ulcerate healthy human duodenum. In this issue, Dr. DOLL, Dr. AVERY JONES, and Professor MACLAGAN bring forward evidence that doctors now suffering from ulcer-type indigestion produced on an average a larger volume of juice than normal in response to histamine when they were tested as medical students. The results are statistically significant. Some will not agree, however, that this new evidence supports the hypothesis that hypersecretion is a

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1. James, A. H., Pickering, G. W. *Clin. Sci.* 1949, 8, 181.
2. For a review of the published work see Ivy, A. C., Cummins, G. M., Grossman, M. I. *Gastroenterology*, 1948, 10, 714.

cause rather than a result of ulcer. Two other interpretations need to be considered. Some people probably develop hypochlorhydria or achlorhydria at a fairly early age, and so run little risk of duodenal ulceration. Most of these constitutional hypochlorhydrics will fall in the no-ulcer-type-dyspepsia group, and hence its mean secretory response to histamine will be abnormally low. In other words, the histamine test-meal picks out the group which is relatively immune to duodenal ulcer rather than the group which is highly susceptible. Then, the physiological purist may say that hypersecretion indicates an unhealthy duodenum. Normal gastric secretion and emptying are controlled by inhibitory im the duodenum and small intestine. As on a the traffic is controlled by the sector in front "come," not by the sector behind saying " The disturbance of function in a young ulcer patient often affects the entire gut, and no animal evidence that excess of acid or the pre of an ulcer can cause so widespread a d motility. It is equally likely that the primary b down is a failure of entero-gastric and entero-en inhibition, and that the functional disturbanc secretion and motility, together with the formation of duodenal ulcers, are secondary.

Annotations

DEOXYCORTONE IN RHEUMATOID ARTHRITIS

THE demonstration by Hench that rheumatoid arthritis is dramatically improved by 'Cortisone' has led to the expected flow of new work. The beneficial results obtained with anterior pituitary adrenocorticotropic hormone (A.C.T.H.) by Thorn and Bayles [1] were discussed in these columns on Oct. 22 (p. 758). Boland and Headley [2] have lately confirmed the good effects of cortisone, and they suggest that it may be possible to treat less severe cases of rheumatoid arthritis with smaller doses than those used by the Mayo Clinic workers, though much further work is required before the dosage is properly worked out.

The preliminary communication from Gothenburg that we publish this week represents a new approach. Lewin and Wassén have found that the intramuscular injection of 5 mg. deoxycortone acetate, followed in 5 minutes by 1 g. of ascorbic acid intravenously, produces a nearly complete, though temporary, relief of rheumatic symptoms. The effect begins in 5 minutes and reaches its maximum in 15–30 minutes, usually persisting for 2–6 hours, though occasionally for 24 hours or longer: repeated treatments have apparently longer-lasting effects. Benefit has also been obtained in one case by implanting a 100 mg. tablet of deoxycortone subcutaneously and thereafter giving injections of 0·5 g. of ascorbic acid every 6–8 hours. If these results are confirmed, the discovery will be a great step forward; for deoxycortone is manufactured synthetically and is relatively plentiful, whereas cortisone and A.C.T.H. are both rare and likely to remain so.

From the experimental point of view the beneficial effect of deoxycortone is unexpected. Selye, in his previous work on the "alarm reaction," had found that rats treated over long periods with deoxycortone often developed an arthritis, and his latest paper [3] carries this a stage further. By injecting formaldehyde near the joints of rats he regularly produced an arthritis, and the effects of treatment with deoxycortone and with cortisone on this arthritis were diametrically opposed. If an adrenalectomised rat had been given deoxycortone for a period before the injection of formaldehyde, the arthritis was more severe than that in the control animal, whereas simultaneous administration of cortisone with the deoxycortone prevented the development of any significant arthritis. In the intact rat, the injection of A.C.T.H. 25 minutes before the injection of formaldehyde protected the rat against the development of arthritis, through stimulation of its own adrenals, and adrenal stimulation by means of an "alarm reaction" produced by various means also inhibited the dev ment of an arthritis after the injection of formaldel

The adrenal hormones are known to differ wide their actions in other fields: thus deoxycortone has a powerful regulating activity on salt metabolism, wh cortisone has little effect on salt but much on It is therefore not surprising that they have diff effects on such conditions as arthritis. Spies and St have suggested a test for cortisone-like activity observing the fall in eosinophil-counts on the adm tration of the substance under test; they found in contrast to A.C.T.H., deoxycortone had no effect on eosinophil levels, suggesting that it has therefo cortisone-like activity. Lewin and Wassén seem have altered its action profoundly by giving it in junction with ascorbic acid, but much more work be needed before their clinical observations ca reconciled with the experimental results of Selye.

NURSING TO THE LOOKER-ON

How is the young nurse to be taught the art of s gumption? Miss Josephine Brew, LL.D., who education adviser to the National Association of G Clubs and Mixed Clubs, posed and pondered this ques at a conference on The Tutor in the National He Service, held at the Royal College of Nursing last w It must be done by teaching not only knowledge values, she suggested. If the nurse does not e her training, then it is not a perfect training; for possible for a good teacher to teach any subject though it was the most exciting thing in the wo and for a bad teacher to teach even appreciation films as though it were the most boring. The t should stretch the imagination of nurses not me until they are never bored, but until they develop that matchless quality in life: zest to carry them thro dull jobs and all the irritations of institutional liv Then, Dr. Brew considered, they should be given so idea of how the mind works—of how we all rational lie, steal (affection, reputation, or opportunity, if we are to be trusted with material things); and we all indulge at times in emotional blackmail: " could you do this when I have such a headache or "I've given the best years of my life to you," (ne stopping to ask ourselves whether anyone else want them). It matters less what they are taught than th the teacher should give them some vision of greatne If the chief needs of the nurse are knowledge, efficien and humanity, she said, then the greatest of these humanity, for which the other name is *caritas*.

For the tutor who means to kindle her students this way, there are many great names in nursing to before them. It was curious that Mr. G. B. Jeffer director of the University of London Institute of Educ tion, should say earlier in the conference: "You nurses are alive and kicking young women. You m not take that material and turn it into a nice copy what you may think Florence Nightingale might ha

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1. Thorn, G. W., Bayles, T. B. *Practitioner*, October, 1949, p. 365. See also Thorn, G. W., Bayles, T. B., Massell, B. F., Forsham, P. H., Hill, S. R., Smith, S., Warren, J. E. *New Engl. J. Med.* 1949, 241, 529.
2. Boland, E. W., Headley, N. E. *J. Amer. med. Ass.* 1949, 141, 301.
3. Selye, H. *Brit. med. J.* Nov. 19, p. 1129.
4. Spies, T. H., Stone, R. E. *Lancet*, Nov. 12, p. 890

like if she were living in 1949.". Surely few young en have ever been more alive, or kicked more, Miss Nightingale. But no doubt in another sense as right: a nursing profession composed entirely of dynamic personalities would be decidedly unman- ble. He appealed for better handling of the young e's enthusiasm, which though it may at the outset ealistic and shallow can yet be fostered and deepened the right approach, or destroyed by cynicism and idity.

r. Elizabeth Findlay discussed the possibility of blishing a training course for a nursing degree in the University College of North Staffordshire, to be ned next year; and Mr. J. W. Bispham, education er at the Institution of Mechanical Engineers, pointed the part the polytechnics might play in bridging the between school-leaving age and entry to hospital. group discussions later, some problems of promotion e debated. It seems that higher qualifications nt less in nursing than in medicine; the nurse who taken the trouble to prepare herself for promotion seeking appropriate experience and taking addi- al certificates cannot be sure that these things will gh at all with appointing committees—a powerful ouragement to zest.

DRAMAMINE IN RADIATION SICKNESS

ADIATION sickness is one of the unpleasant features of iotherapy and is fairly common. It may be mild, prising headache, lassitude, anorexia, and nausea icient to make the patient feel miserable: or it may severe and cause vomiting, diarrhœa, and great stration necessitating the interruption or even cessa- n of the course of treatment. The cause is thought to changes in the metabolism of the cells which are most sitive to radiation, for it is most likely to occur during rapid breakdown of a very radiosensitive tumour. e incidence is increased when a large volume of tissue rradiated with a high daily dose, and the severity of sickness also varies with the site, being much more nounced when the thorax or abdomen is treated than ing irradiation of the limbs. Many remedies have n tried, but most of them have been only moderately cessful and their popularity has soon passed. Pyri- xine, a member of the vitamin-B_2 complex, found in er and yeast, has given the best results so far, though is by no means infallible. This substance not only ieves the radiation sickness but also raises the cocyte-count—a valuable effect since radiation often presses the white-cell count.

Lately Beeler and colleagues at the Mayo Clinic[1] ve been giving the new drug, 'Dramamine' (β-dimethyl inoethyl benzohydryl ether 8-chlorotheophyllinate), in iation sickness. This was first used for its anti- tamine action and later found to be remarkably ective in the prevention and treatment of sea-sickness d air-sickness[2] and in controlling vomiting of preg- ncy.[3] They gave dramamine to 82 patients with lignant disease of various kinds while they were under- ing X-ray treatment. To eliminate the psychic effects far as possible, a control series of 23 patients who lieved they were having the drug were also observed. diation sickness was present in all the cases before e drug was started. The proportion of apparently od or excellent results was much higher in the group ceiving dramamine (79%) than in the controls (13%). e best effect was obtained with 100 mg. of dramamine en $^1/_2$–1 hour before treatment and repeated $1^1/_2$ hours er treatment and again 3 hours later, making a total 300 mg. Some patients needed only 200 mg., whereas me needed as much as 400 mg. A few of the patients had side-effects, such as drowsiness, bad taste, paræsthesias, and nausea. Drowsiness was the most unpleasant of these. and 3 patients in the series had to give up the tablets after 3–4 days of constant sleepiness. In some patients whose radiation sickness was causing severe nausea and vomiting the results were improved by combining the dramamine with pyridoxine intravenously.

It is difficult to explain the action of dramamine in radiation sickness, but it is probably not due to its antihistamine qualities since other drugs with greater antihistamine effects do not control the sickness, though they do relieve vomiting of pregnancy.[4] It has been suggested that it depresses the vomiting reflex, but this view would not explain the relief of malaise, lassitude, and prostration, unless these symptoms are secondary to the stimulation of the vomiting reflex. If the results are confirmed the drug will be very useful, since it is both inexpensive and safe, but unfortunately it is still unobtainable in England.

OBSTETRICAL BRAINS TRUST

UNDER the title "Any Questions?" a meeting on the Brains Trust plan was held at the Royal College of Obstetricians and Gynæcologists on Nov. 18, and the audience evidently enjoyed themselves no less than the members of the trust—Sir William Gilliatt, who acted as question-master, Prof. W. C. W. Nixon, Miss Josephine Barnes, Mr. John Stallworthy, and Mr. Humphrey Arthure. The impromptu answers and "back-chat," not to mention Mr. Stallworthy's characteristic reminiscences, kept the proceedings very much alive.

(1) *Does surgical induction have a place in the treatment of mild cephalo-pelvic disproportion?*—Mr. Stallworthy did not think it had in the case of the primigravida but in others he had no objection to employing the Drew-Smythe catheter, and if trial labour failed he had no hesitation in performing cæsarean section. Mr. Arthure said that mild disproportion should be overcome by labour any way, so surgical induction was not indicated.

(2) *What steps should be taken to prevent sudden death in the first 24 hours of the puerperium in the woman with a serious heart lesion?*—Miss Barnes said that the coöperation of the cardiologist was essential and she was in favour of not allowing the case to go to term; immediate venesection should be employed. Professor Nixon extolled the use of a tight abdominal binder.

(3) *Is progesterone any use in the treatment of threatened abortion?*—Sir William Gilliatt referred to the difficulty of reliably estimating pregnanediol in the urine; he himself might prescribe progesterone, but its use was somewhat empirical and its value problematical.

(4) *What part does cæsarean section play in the treatment of primary uterine inertia?*—Professor Nixon thought it played a very big part and he infinitely preferred it to incision of the cervix. He stressed, however, the need for care in the diagnosis of inertia. Mr. Stallworthy agreed but did not altogether disapprove of incising the cervix when the head was already deep in the pelvis; in such cases the cervix and lower segment were often very thin and the baby's head well moulded for vaginal delivery, and cervical incision was less traumatic than cæsarean section. A fœtal mortality of 45% had been quoted following this procedure, but much of this was due to poor selection of cases. In his own department recently cervical incision had been performed 8 times in suitable cases with 100% success. In the case of occipito-posterior position where the head remained high, the membranes ruptured early, and labour continued to be inert, cæsarean section might be called for in view of the high fœtal mortality. Mr. Arthure thought that cæsarean section should be looked on as a failure of the ordinary methods of treatment; he also drew attention to the value of continuous caudal analgesia in a slow painful labour. Sir William Gilliatt remarked on the difficulty of accurately labelling and assessing a case of inertia. He regarded the lower segment operation as very safe both for the present delivery and in relation to pregnancies to come, and he had little hesitation in using it in the inert case.

Beeler, J. W., Tillisch, J. H., Popp, W. C. *Proc. Mayo Clin.* 1949, 24, 477.

See Leading article, *Lancet*, 1949, i, 827.

Ibid, Sept. 24, p. 585.

[4] Dougray, T. *Brit. med. J.* Nov. 12, 1949, p. 1081.

(5) *A primigravida, at 34 weeks, has had a surgical induction for toxæmia ten days ago, but is still not in labour; she is draining offensive liquor, her temperature is 100°F, and the fœtal heart-sounds are still audible: what should be done?*—Mr. Arthure said he would have already used further efforts to get labour under way; he might even have used a hydrostatic bag, or he might already have done a cæsarean section. As things now are the only course was to operate after preliminary chemotherapy in order to save the baby. Professor Nixon said this was surely a case for extraperitoneal cæsarean section. He agreed that the case could not be left and the threat of eclampsia still hung over the patient. Mr. Stallworthy thought that at 34 weeks there was a fair chance that the head would be high anyway and this would make cæsarean section the wiser course, but if the head was deep in the pelvis a bag could be used. He did not care for the extraperitoneal operation because he trusted the peritoneum more than the pelvic cellular tissue to cope with infection; the technical difficulties of the operation often led to accidental opening of the peritoneum. This brought a retort from Professor Nixon that opening the peritoneum mattered little provided that it was recognised before the infected uterus was opened; it could then be simply closed. He quoted the remarkable case-mortality of 0·8% in Whittaker's series of about 300 cases.

(6) *Can ovulation occur before puberty and can conception occur before ovulation?*—Miss Barnes answered "Yes" to the first part and "No" to the second.

(7) *What is the best method of emptying the uterus in a case of hydatidiform mole?*—Mr. Arthure thought that if spontaneous abortion had already begun it should be allowed to continue; but otherwise he favoured abdominal hysterotomy, because one could then be more certain of removing the mole completely, the risk of subsequent chorion epithelioma was reduced, and the perforating type of mole could be recognised at operation. The large uterus should certainly be emptied by the abdominal route. Professor Nixon favoured evacuation from below, and Miss Barnes agreed provided uterine activity had first been stimulated by medical induction. Sir William Gilliatt recommended laminaria tents for 12–24 hours followed by evacuation from below. The tents would ensure better uterine tone and so reduce hæmorrhage during evacuation; this alone was reason enough for not relegating them to the museum. For the elderly, hysterectomy was the safest course.

(8) *What is the treatment of imperforate hymen with hæmatocolpos, hæmatometra, and hæmatosalpinx?*—Professor Nixon: "Incise the hymen." Miss Barnes: "Excise the hymen." All agreed that there was no case for laparotomy and that the need for rigid asepsis was paramount. Sir William Gilliatt added that one would not know at the time of operation that the tubes were in fact distended with blood, and the reckless folly of trying to find out by bimanual examination was at least implied.

(9) *What is the treatment of genital tuberculosis, and is dilatation and curettage ever justified?*—Mr. Stallworthy said one must distinguish between the cases without physical signs, which were discovered during investigations for sterility by routine endometrial biopsy, and those with obvious clinical pelvic disease; he had yet to see a case of the latter that had been cured without radical surgery or had subsequently become pregnant. Streptomycin might alter this outlook and initial results seemed encouraging. Curettage, though it involved a risk of spreading infection, might be necessary before the pelvic tuberculosis could be diagnosed in the first place, and endometrial biopsy could easily miss the tubercle. Miss Barnes had treated a few cases with streptomycin. Such cases must be very carefully controlled and patients with associated pulmonary or renal lesions should be excluded. Results were not likely to be conclusive for many years. Cases without large masses in the pelvis did best. Professor Nixon said that X-ray therapy should be considered.

(10) *What method of induction is safe to prevent a case booked for trial labour from becoming postmature?*—Mr. Arthure eschewed surgical induction if trial labour was contemplated but had no objection to medical induction. Miss Barnes would not even use pituitary extracts in such an induction because of the risk of uterine rupture—in fact, she did not use induction in trial labour at all and preferred to stand by her original decision. Sir William Gilliatt said that trial labour must be spontaneous and not induced labour, and that the use of pituitary extracts increased the fœtal mortality.

(11) *When should it be considered that trial labour?*—Miss Barnes thought a decision should be reached to allow labour to continue by examining the patient 24 hours of real labour or after the membranes had ruptured for 4 hours. The question of failure could considered, however, while the membranes remained Mr. Arthure disliked the setting of arbitrary time-l a trial labour had failed only if progress ceased, and had to be estimated by vaginal examination. Pro Nixon said that failure often occurred long before full d tion; fœtal distress was in itself an indication for interv Mr. Stallworthy pointed out that progress was not indicated by descent of the presenting part but als progressive dilatation of the cervix.

Sir William Gilliatt's closing remark, that fu meetings of this sort were likely to be as profitable as entertaining, was applauded.

DRINK

RATS, pigs, monkeys, and other animals readily de a taste for alcohol; about the only exception is cat, which, given the choice of milk or milk and bra will take the latter only when its hair is standin end. Dr. J. Y. Dent told this to the Hunterian So last Monday in speaking for a motion "that alcoho contributed more to the happiness than the miser mankind"; and he went on to advise that man sh drink like the cat. He divided mankind into groups: alcohol addicts, those who drink to excess temperate, and abstainers. Addicts (who in the U. number about 6% of drinkers) can never hope to alcohol temperately: for them the only way is long abstinence. Often these are intelligent and people, eager to be cured; and they should not confused with the self-indulgent drunkard of the that "insists on going to the dogs," and for whom only cure is penury. Paragons are sometimes unc fortable people to live with; and those who drin excess at least have a proper humility. To the temper alcohol makes friends seem more friendly and ener less hostile. Even the abstainer may derive satisfac from alcohol through a sense of superiority—a "so unction" denied to those who drink.

As a psychiatrist Dr. Desmond Curran was able show that alcohol is an increasingly rare cause of me breakdown. He enjoys seeing alcoholics; they engagingly shameless and their condition is of amenable to treatment. In drink they get what t deserve; he has seen a man with a robustly chee personality laugh at the snakes in his bath. Ma articles, he said, have been written on alcohol a cause of mental illness. Can it also prevent it? believes that it can. He observed during his w time experience in the Navy that mental breakdo was much less common under the stress of service sea than on shore. By analogy, might alcohol have a place in ensuring a smooth transition from trials of a day's work to the comparative calm of home?

The motion was opposed with skilled advocacy Dr. Henry Yellowlees and Mr. Archibald Crawford, Dr. Yellowlees conceded that the expectation of l for moderate drinkers was greater than for abstainer that it could afford dutch courage; enable the shy speak; possibly assist the creative worker; and pr mote conviviality. But how many "jolly good fellows were needed to balance the suffering caused through o child being run over by a drunken motorist? The motio before the meeting could not be answered in terms logic and should therefore be rejected. To the questio whether alcohol had greater potentialities for good o for evil, intelligent people could give only one answer.

The discussion revealed general recognition th alcohol is no longer the pressing social problem that i was. More than one speaker spoke, perhaps a littl wistfully, of the days when gin was 3*d*. a glass; but th ning of alcoholism was ascribed not only to the grow- cost but to improved social conditions, the restrictive ising laws, the advent of cinemas and radio, and the iged attitude to heavy drinking. From a large gather- not a single convinced teetotaller emerged to express riewpoint. Nevertheless the motion was rejected.

DENTAL DRILL OR HIGH-PRESSURE JET?

IE faint purr of the electric motor on the dental is enough to make cowards of most of us, and when faint purr is transmuted into a shattering vibration ur mouths our terror is complete. Why this should o it is hard to say. The vibration and the noise are ittedly unpleasant, but in skilled hands and with ern technique drilling is not invariably, or even ssarily, painful. It is perhaps more the feeling of lessness and the fear of that little something extra h may at any moment spring on us that bring it to the brows of the strongest. Local anæsthetics are to a considerable extent to allay these fears. Their is, however, somewhat dangerous in the hands of unwary, since too much live tissue can easily be cut y, giving rise to later irritation of the pulp with the ibility of further unpleasant sequelæ. Their use too lves some pain, since even when the needle is inserted ugh an area of locally cocainised gum its entry is east unpleasant. The numbing of pain by cold has utilised in various techniques, such as allowing a jet of cold water, ethyl chloride, or other chilling it to impinge on the tooth while the drilling is in ress. None of these manœuvres has proved wholly essful. Now from the United States, home of inven- s both credible and incredible, comes news of a new ce in which a jet of carbon dioxide carrying fine icles of abrasive aluminium oxide is directed at the h and the abrasive dusts are sucked up by a vacuum . The nozzle of the jet is only 1/18,000th of an inch iameter but the pressure behind the jet is 75 lb. per re inch. For long we have been brought up to ve that pain in the dentine is caused, among other gs, by pressure, and certain it is that the pressure of a probe on sensitive dentine is decidedly unplea- . What happens when particles launched with 75 lb. square inch behind them hit this sensitive dentine re not told. We can only hope that this invention es less fearsome in practice than it sounds.

CHLOROMYCETIN IN TYPHOID FEVER

NTIL the introduction of chloramphenicol ('Chloro-etin') there was no satisfactory chemotherapeutic it for typhoid fever. Some of the sulphonamides reported to protect mice infected with lethal doses . *typhi*; and the less soluble sulphonamides, such as haguanidine and succinylsulphathiazole, are reputed elieve the abdominal symptoms, though the evidence never been very convincing. In high concentrations cillin and streptomycin inhibit *S. typhi*, but they do clearly alter the course of the disease.

itial studies on the antibiotic, chloramphenicol, ved that it had a wide antibacterial spectrum and particulary active against rickettsial and gram- tive bacterial infections, including those produced members of the salmonella group. The original rt of Smadel and his co-workers[1] on the beneficial t of chloramphenicol on typhoid fever in Malaya was owed by that of Woodward and his colleagues.[2] ourable reports have been published in this country Murgatroyd,[3] Bradley,[4] Lomax,[5] Douglas,[6] and Patel et al[7]; in the U.S.A. by Foste These reports deal, however, only with i small noncontrolled groups: and so the usually impressive, have had to be interpre The virulence of strains of *S. typhi* v in some outbreaks the illness is severe and high, while in others it is mild and runs relatively benign course. Moreover, in assessing results the effect of previous inoculation has also to be borne in mind. With the synthesis of chloramphenicol early this year in the Detroit laboratories of Parke, Davis & Co. and the consequent improvement in supplies, it has been possible to treat larger groups. Woodward,[9] of Baltimore, has now treated 21 cases in which the diagnosis was confirmed by blood-culture. The patients were treated in the active phase of the disease, the course of which was followed by observations on the clinical condition, the duration of fever, and repeated blood, stool, and urine cultures. By the 3rd day clinical improvement was apparent, with relief of headache, cough, and delirium, and disappearance of rose spots; the average duration of fever from the start of treatment was $3^{1}/_{2}$ days. Nevertheless, some patients continued to harbour the typhoid organism and relapses ensued if the drug was given for less than 8 days.

In this issue Cook and Marmion describe the results obtained with chloramphenicol in 14 cases treated in the British Military Hospital at Fayid, Egypt. Fever began to abate within 24 hours, and had usually disappeared within 5 days; the mental state cleared, toxic symptoms began to disappear, and the appetite returned within 4–6 days. At whatever stage it was given, chloramphenicol seemed to arrest the disease; but Cook and Marmion, like Woodward, remark that intestinal hæmorrhage and perforation may still occur. There were no deaths in the 14 treated cases, and 1 death among the 11 untreated; but the results are actually better than this suggests, because all the seriously ill patients received chloramphenicol. Confirmation of these observations comes from Conti and his colleagues,[10] in Italy. In their series of 63 cases there were 4 deaths, 3 of which were attributed to treatment being started too late; and there were 9 relapses.

Chloramphenicol is undoubtedly the best chemotherapeutic agent that we have for typhoid. Very few toxic effects have been observed, and it does not appear to produce resistant strains. The one drawback is that it does not always sterilise the gut, so that relapse may follow and carriers may still transmit the disease; but this may be a question of dosage. Further trials are needed with larger doses given over longer periods, but shortage of the drug is still a limiting factor.

THE MINISTRY OF HEALTH

Sir WILSON JAMESON, G.B.E., F.R.C.P., K.H.P., chief medical officer of the Ministry of Health and of the Ministry of Education, is retiring from the public service on reaching the age limit on May 11, 1950. He has been chief medical officer since Nov. 12, 1940. The Minister of Health and the Minister of Education have appointed Dr. JOHN ALEXANDER CHARLES, F.R.C.P., K.H.P., a deputy chief medical officer in the Ministry of Health, to the joint post thus to be vacated next May. Dr. GEORGE EDWARD GODBER, F.R.C.P., will be deputy to the chief medical officer in succession to Dr. Charles.

THE Royal College of Obstetricians and Gynæcologists has launched an appeal for £400,000, of which £350,000 is required for research, building, and general funds and £50,000 for a travelling professorship. Since 1929 fellows and members have contributed £70,000.

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Special Articles

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

1599–1949

A. K. Bowman
M.B. Glasg.
SENIOR ADMINISTRATION MEDICAL OFFICER, WESTERN REGIONAL HOSPITAL BOARD

Although insignificant upon the scale of geological time, 350 years is sufficient to invest an institution with a venerable quality. The Royal Faculty of Physicians and Surgeons of Glasgow may accordingly be placed in the dignified category, hitherto occupied, so far as Glasgow is concerned, by the Cathedral and the University.

The Royal Faculty was established in November, 1599, and through its origin it occupies a unique position among those bodies in the United Kingdom which are entitled to grant a registrable qualification to practise within the profession of medicine. It was founded in a great period of British history by James VI, some three years before his succession to the English throne; and the charter of foundation executed by the King was secured by the exertions of Mr. Peter Lowe, who was perhaps the most distinguished surgeon of his time in this country. Lowe was a master of arts, probably of the University of Orleans; and he describes himself also as a doctor in the Facultie of Chirurgerie in Paris. The latter was the title claimed by members of the College of Sworn Master Surgeons of Paris, known as Surgeons of the Long Robe to distinguish them from the barber-surgeons, the lesser Surgeons of the Short Robe. His association with this college, which was established in 1216, was of importance to the Glasgow Faculty, for in the original charter of the latter, no provision was made for the admission of the barber-surgeons; and it is further proper to assume that Peter Lowe possessed a just appreciation of the standard of practice which was to be regarded alike as the aim of the profession and the right of the patient.

Lowe himself certainly had taken his responsibility seriously. During a residence of some 30 years on the Continent he had seen much service with the French armies in the field in France, Flanders, and elsewhere, and had been rewarded with the appointment of Ordinary Chyrurgion to the "French King and Navarre"—that is Henry IV. In the last decade of the 16th century he returned to Britain and ultimately he settled in Scotland. In 1596 he published in London his *Spanish Sickness*, a work on syphilis, and in the following year *The Whole Course of Chirurgerie* appeared.

In 1598 he became a salaried or pensioned surgeon in Glasgow, which at that time was a small cathedral and university city of some 7000 inhabitants—a place of less wealth and moment than perhaps some other ten towns in Scotland. The number of surgical practitioners was about half a dozen, and there was one physician. None of these practised obstetrics, which was in the hands of two midwives who were answerable to the kirk session; and the conditions of medical practice as a whole were so deplorable that Lowe's soul was revolted. It is significant that shortly after his arrival in the city, where he married the daughter of a Presbyterian minister, the Church represented to the town council and the university that some action was urgently necessary to inquire into the professional fitness of all practitioners of medicine; and with the assistance, no doubt, of the Church and of the civic fathers Lowe made made strong representations to the Scottish for the foundation of a responsible body with visory powers over medical education and The result was the charter to which reference has been made.

POWERS GRANTED TO THE FACULTY

After a preamble which touched upon the abuses which the practice of medicine was subject, the cha conferred upon "Maister Peter Lowe, our Chirurgi and Chief Chirurgiane to oure dearest son, the Pri (Henry, the heir apparent who died in 1612) with assistance of Mr. Robert Hamiltoune, Professoure Medicine (that is physician) . . . full power to call before thame . . . all personis professing or using the airt of Chirurgie."

The bounds of the jurisdiction of these officers of faculty were wide and comprehended not only the of Glasgow itself but a territory which included county areas of Lanark, Ayr, Renfrew, and Dunbart The powers conferred upon the faculty were also In addition to a tutorial function, the faculty was m responsible for the examination and licensing "accor to the art and knowledge they should be found worth exercise" of all those who professed the practice surgery; and it was also authorised to prohibit prac beyond the scope of the licences thus granted. Infri ment of these orders and dispensations became p offences punishable by fine, seizure of property, imprisonment. It was further an obligation on the off of the faculty to visit everyone hurt, murdered, poiso or "Onie other persoun tane awa extraordinarily"; with the coöpted assistance of Mr. William Spang, apothecary, to control the sale of drugs and to proh the sale of unfamiliar medicaments and of poisons exc by apothecaries charged to "take caution of the chasers." There was thus an enlightened foreshadow of the Dangerous Drugs Acts of the present day, altho it must be admitted that the faculty of the early century was more concerned with the adequateness supply rather than with the purity, suitability, strength of what they supplied.

THE FIRST UNIVERSITY CHAIR

Although the University of Glasgow had been est lished in the year 1451, and is now approaching period of its quinquennium, there was in Lowe's time

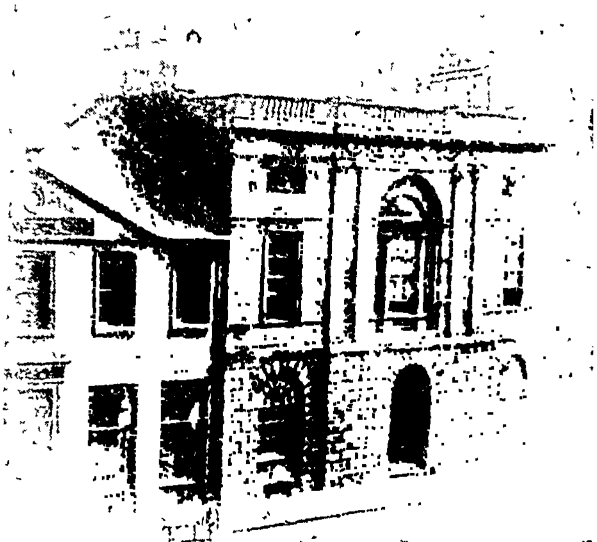
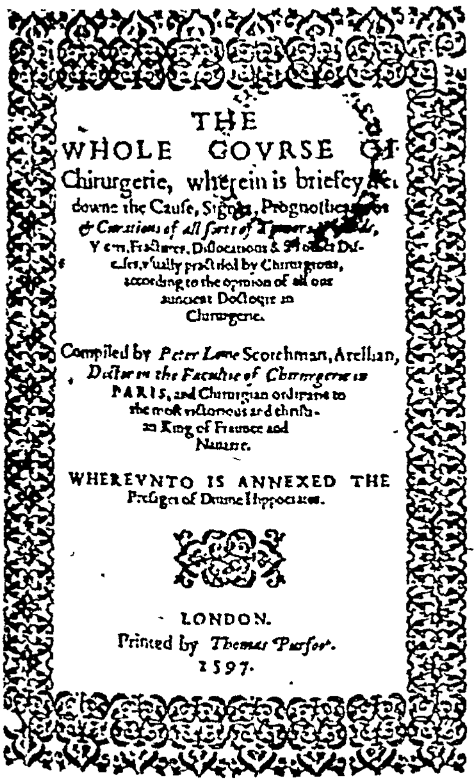


Fig. 1—Second hall of the faculty in St. Enoch's Square, built in 1791



THE
WHOLE COVRSE OF
Chirurgerie, wherein is briefly set
downe the Cauſe, Signes, Prognoſtications
& Curations of all ſorts of Tumors, Wounds,
Vlcers, Fractures, Dislocations & all other Diſ-
eaſes, vſually practiſed by Chirurgions,
according to the opinion of all our
auncient Doctours in
Chirurgerie.

Compiled by *Peter Lowe* Scotchman, Arellian,
Doctor in the Facultie of Chirurgerie in
PARIS, and Chirurgian ordinarie to
the moſt victorious and chriſti-
an King of Fraunce and
Nauarre.

WHEREVNTO IS ANNEXED THE
Preſages of Diuine Hippocrates.

LONDON.
Printed by *Thomas Purfoot.*
1597.

1.—Title-page of Lowe's great work from the copy in the library of the faculty.

lical faculty there. It may be that the existence of Faculty of Physicians and Surgeons retarded develop- it in this direction. The first halting step was taken the university in 1637, when Mr. Robert Mayne was ointed professor of medicine. He did not, however, ive much encouragement to teach, for in 1642 the tation from the General Assembly of the Church of tland declared that the profession of medicine was ot necessary for the college in all time coming." ne was, however, granted leave to continue in his ipancy of the chair during his lifetime. In 1646, r his death, the university faculty of medicine ceased, the time being, to exist.

he system of laissez-faire was maintained until beginning of the 18th century, when one of those ll incidents occurred which are far reaching in their cts. In the year 1703 a student of medicine from land applied to the university for examination for degree of doctor of medicine. Since there was no fessor of medicine the problem confronting the demic authorities was serious. The solution was, ever, found in the fact that Robert Sinclair, the fessor of mathematics, was by chance a doctor of licine; and it was resolved that he should be ointed *pro hac vice* as professor-extraordinary of licine. For the purposes of examination two other l practitioners, graduates of the University of den, were associated with him as assessors. The lent was duly examined, adjudged qualified, and nitted to a degree. Eleven years afterwards, in 1714, university faculty of medicine came formally into ig.

THE FACULTY AS A LICENSING BODY

t is, therefore, clear that the earliest medical teaching Glasgow was given directly under the auspices of the ulty of Physicians and Surgeons. It was indeed one he duties of the president to give systematic instruc- ı to the apprentices of the surgeons, with regular examinations to assess their professional progress during their apprenticeship and at the end of their pupilage. The faculty did not, however, assume the functions of a medical school in the true sense of the word. It was not a teaching body; but for more than two centuries it retained control of the licensing of practitioners and surgical apprentices. Even after medicine and surgery had been recognised as subjects of individual study and examination in the university, the faculty obtained a decision from the Court of Session that without examination and licence the holder of a university degree was not entitled to practise surgery within the confines of its prescribed territory. This decision of the Scottish Courts was grudgingly confirmed by the House of Lords in 1840. The situation was, of course, changed by the medical legislation of 1858, and since then many of the original powers have naturally been in abeyance.

At the present time the Royal Faculty, as it became in 1909 through the regal gesture of King Edward VII, is entitled to give a registrable qualification in conjunction, chiefly, with the Royal Colleges of Physicians and Surgeons of Edinburgh; and it also grants diplomas inter aliâ in public health and dentistry. The fellowship is granted by election, after examination, to licentiates and medical graduates of universities. Thus in Glasgow the two great branches of the profession have, since the earliest days, been associated in one corporation. The practice of the Royal Faculty has here differed consistently from that which has prevailed in London, Edinburgh, and Dublin; and as an earnest of the unity of the profession offers a useful and important object lesson.

PAST MASTERS

It is at once a natural impulse and, in some measure, a moral obligation to venerate the memory of great men. Many such have been members of the Glasgow faculty, and in honouring them honour must be done to the faculty itself. The soundness of the whole depends upon the worthiness of the component parts, and no doubt the cloud of witnesses whose names appear as testimony upon the roll of fellows and who have added grace, strength, and dignity to the faculty will be remembered during the celebration of the 350th anniversary which is about to take place. Among them, William Cullen, William Smellie, and William Hunter, from a triumvirate in which the name of William seems to have possessed peculiar virtue.

It is true that William Hunter was neither a member nor a fellow of the faculty. He was apprenticed to Cullen when the latter wasi n practice in Hamilton, but Cullen was apparently at that time an unlicensed practitioner and consequently Hunter's name does not appear upon the records of the faculty even as an apprentice. Legally, however, he should have been so registered; and, in any case, his close association with the Glasgow school and his bequest to the university of the Hunterian Museum would seem to make it quite proper to include his name with the others which are mentioned here.

William Smellie, who was a practitioner in Lanark, went to London and to Paris in search of enlightened teaching on midwifery; but finding none he settled down in London and made himself the teacher. As the leading obstetrician of his time in Britain on the practical side, his work must be associated with that of William Hunter on the scientific side; and, by the combination of their efforts, the fellow of the faculty and his associate elevated midwifery from what was at best a handicraft to the position of a science.

Of William Cullen it may certainly be said that he laid the foundation of the Glasgow medical school; and it may probably also be said that he was the actual founder of modern medicine and the initiator of clinical teaching. The greatest of his pupils were William Hunter, through whom his influence passed vicariously to John Hunter; and Joseph Black who, as professor of medicine in Glasgow, initiated the doctrine of latent heat, a discovery which was fraught with such significance for science and for mankind that at the present day the world trembles at the fearful possibilities which have developed from the mechanisms to which his thought gave birth.

From this concurrence of notable minds an interesting succession was begun. Cullen taught Joseph Black; Black taught Thomas Thomson; Thomson, when professor of chemistry, taught Thomas Graham, afterwards Master of the Mint and for some time professor of chemistry in Anderson's College; Graham, in University College, London, had as a pupil Joseph Lister. Thus, after a lengthy interval, the founder of modern medicine was linked with the founder of modern surgery. All these men belonged to the Glasgow school, and their names, moreover, are all inscribed upon the roll of the Royal Faculty of Physicians and Surgeons.

When to these few representative names are added those of Allen Thomson, the anatomist; David Livingstone, the missionary explorer; William Tennant Gairdner, the physician and naturalist whose influence in the development of scientific medicine and of public health was so profound; and William Macewen whose mind lightened so much darkness and whose hand steered into the uncharted depths of cerebrospinal surgery—when we think of these names the greatness of Peter Lowe's accomplishment becomes apparent. The closing words of his epitaph, engraved upon his tombstone in the churchyard of Glasgow Cathedral, speak of humility and mortality; but while they describe the temporal quality of the things of the body, they throw into high mental relief the eternal nature of the things of the spirit:

Ah Me I Gravell Am And Dust
And To The Grave Deshend I Most
O Painted Piece of Liveing Clay
Man Be Not Proud of Thy Short Day

With these thoughts in mind, there will be many who will wish continued God-speed to the Royal Faculty.

FELLOWSHIP FOR FREEDOM IN MEDICINE

OUTLINE OF POLICY

At the first annual meeting of the Fellowship for Freedom in Medicine, held in London on Nov. 19, Lord **Horder**, the chairman, announced that the membership was now 2940; in the last nine months an average of 25 new members had joined each week. He often met colleagues "at street corners—well, let us say, in nursing-homes—who wish good luck to the fellowship"; and, obviously there were many who, though they sympathised with its aims, had not joined. Cheques have been sent by American colleagues as expressions of good will.

Lord Horder reaffirmed his hope that through the fellowship the medical profession might achieve unity, without which there was no hope of retaining autonomy. The British Medical Association had provided no shield against State domination. Far from closing the ranks of the profession to present such a shield, it had dissipated its strength by forming three autonomous bodies that negotiated direct with the Ministry, and by setting up a ghost of itself, called the Guild, in the probably vain hope that an action would not lie against it that might lie against the association itself. At what point should the fellowship step in? "This pusillanimity in the leadership of the profession is not getting us anywhere. Time is pressing: things are happening."

POSSIBLE AMENDMENTS

Members were invited to comment on possible amendments to the National Health Service Act suggested by a subcommittee of the executive. In presenting the subcommittee's report, Dr. A. C. E. **Breach**, its chairman, explained that the fellowship's aim was an entirely new amending Bill.

Preservation of Private Practice.—The report suggests that every citizen should have the choice between (*a*) remaining in the N.H.S. but receiving a grant-in-aid from the State if electing to occupy a private bed in a hospital or nursing-home, the grant being based upon the statistical cost bed in a public hospital ward which could otherwise been occupied, and coupled with this the free drugs and certain agreed appliances; and (*b*) opting out service altogether and receiving a refund from the based on the pro-rata cost of the service, to enable individual to make a private contract for his medical needs. "To a very large section of the population," says the report "the enforced contribution bulks too large to be ignored and they feel themselves compelled to take advantage of the facilities offered by the State in return."

"Under present conditions, the cost of the Service wi rise in that the State will be paying a grant-in-aid to Mr. Jones in a nursing-home at the same time as Mr. Jones's bed in public ward is occupied by Mr. Smith, who would otherwi have been awaiting admission; but this is a far less co and more immediately practical way of reducing the waiting lists than a corresponding extension of the hospital service would entail."

"We are exploring the possibility of a plan whereby sum the Government could reasonably be expected to ret annually should be used to cover the premium required for comprehensive sickness insurance on a private basis."

Ownership of Goodwill.—"We recognise that a large num of doctors do not now wish to recover this, but we beli that the *right* to do so is essential to freedom. We rec mend that the Act be so amended as to give doctors, both and in the future, the option to recover the ownership, to build up anew the goodwill of their practices, both priv and State. This would involve repayment of any compens tion already received, and the restoration of the right buy and sell."

Dr. **Breach** observed that the Medical Practic Committee, properly constituted, should be a safeguard but every member was appointed by the Minister, lately its actions had shown to what a large extent was controlled by him.

Dr. J. L. **McCallum** testified that in London it now impossible for a young doctor to enter gene practice "except as a chronic assistant or perhaps some black-market deal in house-ownership." T of the burden of debt under the old system of purch was nonsense; and young doctors were now much wo off, even with the basic salary. Dr. J. A. **Moyse** add that in his area 104 applications had been received a single practice vacancy.

Medical Education.—"Appointments to the boards governors of teaching hospitals must be free from the ris political patronage, and the boards guaranteed comp autonomy in the exercise of their academic functions."

Powers of the Minister.—The report recommends adoption of the method of constituting local executi councils as a pattern for all other administrative committe the relevant interests being directly represented. T Minister's powers are divided into three classes: (1) th that are admittedly essential; (2) those that are free fr objection only if proper facilities for arbitration exist; (3) those that are entirely objectionable. Under the l two headings a number of specific changes in the Act proposed; and the report urges that a standing arbitra authority should be set up to settle all matters in conne with the service where agreement is not reached, and order the payment of compensation where individual rig are violated. Furthermore, the exercise of powers of co pulsory acquisition of land, hospitals, nursing-homes, houses of professional men should be made subject to app to the law-courts.

Members agreed to a resolution by Dr. C. P. **Walla** that a court of arbitration should be set up at o "in view of the Minister's reply to the general pra tioners' demand for adequate remuneration." H. H. D. **Sutherland**, a member of the General Medi Services Committee, hoped that no-one would take Minister's letter as the final word. "We were expect something like this"; and pressure would be continu

Professional Secrecy.—More stringent safeguards needed.

Penalties.—The report claims drastic amendment of penal clauses; the right to appeal to the courts from decisi of the tribunal; and the right to attach a moderate e medical association of a doctor's house on sale. " The ration of this right would provide an inducement to the ng doctor to sell the house to his successor and would l the grave inconvenience caused when the only suitable e for practice is sold in the open market before the ssor has been appointed."

r. J. A. GORSKY pointed out that complaints must eported by executive councils to what purported e an independent tribunal; this was not a judicial n administrative tribunal, and thus it was not bound ive the reasons for its decisions. Under section 42 e Act, not only the executive council but any other n might take his complaint direct to the tribunal. other person might be the Minister of National rance if he thought that his regulations had been gressed by a practitioner; and such a position was erable. The two aims must be to replace the inistrative by a judicial tribunal, and to get rid of 'other person."

spital Medical Staff Committees.—These should be torily recognised as advisory bodies with the right nder advice direct to boards of governors and hospital gement committees.

muneration.—The main principles in the assessment of neration should be laid down in the Act. Full-time ltants should have predetermined salaries, and part- consultants should be given every encouragement to lop private practice. As to general practitioners, the nmendation that smaller lists should carry a higher ation fee is accepted.

swering a question whether the grading committees d not be dispensed with, Dr. E. C. WARNER, the wship's hon. secretary, observed that the formation hese committees had been advised by the Spens mittee, whose recommendations the profession had pted. There was, however, a serious lack of uniity in grading; and the grade of senior hospital ical officer was being used to save the Treasury ey, and to degrade men who had for years been pted by their colleagues as specialists. The Minister being urged to set up a central appeal mechanism, h would go a long way towards rectifying injustices. he proposed distinction awards were described by REGINALD PAYNE as " the biggest piece of academic oolery sponsored by the colleges." It was a terrible g for the president of the Royal College of Physicians e paid by the State. The profession had looked to colleges for moral leadership; but the chance had neglected. The colleges had lost the respect of the lic and the profession; and the proper place for them in the Ministry of Health.

r. GORSKY said that because of the word " autonomy " profession was in a mess. At this juncture the I.A. was powerless to do anything about the general titioner's pay, because the demand had been made he General Medical Services Committee. In devisarbitration mechanism, care would be needed with rd to autonomy; for the Minister might play off body against another. "Where are we going with nomy? To blazes."

e report contains further sections recommending that ents should pay a small fixed charge for each item of ice rendered by a general practitioner; and that the ers of radiological and similar practices should be comsated for the loss of the right to sell them. The committee also considered the vesting of hospital ownership in dy consistituted on a national basis.

The report is to be studied by the executive body who l determine which sections should be incorporated a further amending Bill.

FURTHER BUSINESS

Members agreed that medical students should be mitted as associate members; and the advisability electing laymen to associate membership is being udied.

GENERAL PRACTITIONERS' REMUNERATION

THE following letter, to which we referred briefly last week, has been received by Dr. Charles Hill, secretary of the British Medical Association, from Sir William Douglas, permanent secretary to the Ministry of Health:

Dear Dr. Hill,

On October 31 you sent me two resolutions passed at your Annual Conference, the second of which dealt with the question of calculating the total amount of the central " pool " used in the remuneration of general practitioners. You suggested that this question need not await any revision of the more detailed Tables dealing with the distribution of this pool, and other income. among the general practitioners.

I agree that we have now sufficient information to determine the adequacy of the total remuneration which is going to practitioners taking part in the National Health Service, and I think it may be useful if I set out in the following paragraphs what I think are the salient facts.

(1) Before the war there were about 17,900 principals in general practice whose total income from practice was £28·14 million, of which £11·35 million was for practice expenses and £16·79 million was net income. The Spens Committee thought that the net remuneration before the war was too low, and their recommendations would have meant that the total pre-war remuneration should have been:

	£m.
Net income	19·89
Practice expenses	11·35
Gross income	31·24

(2) The initial central " pool " for the new National Health Service was arrived at by assuming: (*a*) that practice expenses had increased by 55%; (*b*) that there should be a betterment factor of 20% on net incomes; (*c*) that account should be taken of the increase of population of 3%. The new " pool," therefore, was:

	£m.
Net income (£19·89 m. + 20%)	23·87
Practice expenses (£11·35 m. + 55%) ..	17·59
	41·46
Plus 3%	1·24
	42·70

This, however, was for the whole population. It was agreed that 95% of the population should be regarded as possible Health Service patients, so that the total " pool " was 95% of £42·70 m., or £40·57 m. This was estimated to be equivalent to 18*s.* per head of the 95% of the population.

(3) Although the " pool " was so calculated as, by itself, to give a betterment factor of 20% on net incomes, other sources of income under the scheme were made available which substantially increased the real betterment factor. Inasmuch as *all* practice expenses were attached to the " pool," these additional moneys represent net income.

(4) The actual sums of money available for the financial year 1949–50 are now estimated to be approximately:

		£m.
(*a*)	The central " pool " (after taking account of current population)	41·3
(*b*)	Inducement Fund	0·4
(*c*)	Additional mileage money	0·5
(*d*)	Maternity medical services	2·5
(*e*)	Payments for provision of drugs	1·2
(*f*)	Supplementary ophthalmic service	0·2
(*g*)	Payment for trained assistants	0·1
(*h*)	Payments to general practitioners in cottage hospitals	0·2
		46·4
	Exchequer superannuation contribution	2·4
		48·8

(There are also, of course, other sources of income from practice which ultimately fall in whole or part on the Exchequer which are not included in this list—e.g., payment for work done for local health authorities, fees for anæsthetics in dental cases.)

(5) The number of principals is now estimated at 18,936, which is an increase of 5·8% over the 17,900 assumed when the first calculation was made. At the same time the civilian population since June 30, 1939, has increased by about 4·3%, and this increase is reflected in the pool. If the number

of doctors had increased in the same proportion as the population in general there would have been no question of any adjustment for the number of doctors. As it is, we have in effect allowed for an increase of 4·3% in the original number of 17,900—i.e., we have allowed for about 18,670 doctors on the Spens scale, plus betterment of 20%. The actual number being 18,936, there might then have seemed to be a case for a further increase of the original "pool" of 1·5% —i.e., of just over £600,000. This argument, however, would have ignored all sources of income outside the "pool."

(6) I understand that the Association's proposal is, *shortly*:

(*a*) to ignore any sources of income outside the "pool" such as are mentioned in (4) above, and

(*b*) to work out the "pool" total afresh on the basis of the current number of principals and with a 70% betterment factor on gross incomes, and

(*c*) to apply any new capitation fees resulting therefrom, as from July 1, 1948.

If (*b*) were to be worked out on the basis of 18,936 principals the new "pool" would amount to about £53·5 m. This figure compares—as, in the Minister's opinion, there can be no question of ignoring the income outside the "pool" —with the sum of nearly £49 m. already being provided under present arrangements in the way which I have shown.

The Minister is clear that in the light of these figures no reasonable case can be made for any increase in the total remuneration of general practitioners, nor any argument substantiated to show that general practitioners as a group are inadequately paid. Nor, in his view, could any claim be justified that any future alteration of remuneration at any later date should be made retrospective, either to July, 1948, or to the present day. This view rests upon the sheer merits of the case, as revealed by the plain figures and facts as they stand.

The Minister cannot, therefore, entertain any claim by the Association for larger total remuneration.

Moreover, quite apart from this clear conclusion, to which the analysis of the facts must lead him, the Minister would point out that the Association's proposals have to be seen also against the background of the general economic situation and the vital national need to avoid any unjustified raising of remuneration in any field. Under such conditions it becomes even more apparent that it would be impossible for him to justify any increase for general medical practitioners at the present time.

In the circumstances I am wondering whether anything useful would result from the suggested further discussion with representatives of your General Medical Services Committee. If, however, you still feel that such a meeting would be desirable, I need not assure you that I shall be only too happy to arrange it.

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

AT the opening of the 176th session last Tuesday, Prov. DAVID CAMPBELL was elected President in succession to the late Sir Herbert Eason.

In his address the new President paid tribute to his predecessor.

> "The ten years of his presidency were momentous years for the Council. Its administration had to cope with a flood of medical men seeking asylum from a crazy Europe; new disciplinary situations emerged from the stresses and strains imposed by total war; and the general urge for reform, or at least the desire for change which marked the years of sacrifice, led the Council to a searching examination of the basis of medical education. In all these activities the President played a major rôle. He had also the wisdom to foresee that when men's minds were attuned to change the time had come for a review of the legislation which gave birth to this Council and under which we labour . . . when, as we may hope, a new Medical Act is passed in the not too distant future, it will place the hallmark upon a great presidency."

The President went on to welcome two new members—Lord Nathan and Dr. O. C. Carter.

Reviewing the Council's duties, he suggested that the health services would be judged not by the plan of organisation or the methods of finance and control, but by the quality of the medical advice, skill, and care offered to the people.

"In the last analysis," he continued, "that upon the intelligent interpretation and scientific knowledge in its application to the needs individual, and on the moral stature of the In short, medical education and medical ethics ultimately the dominant factors in determining degree of success of any health service.

"This Council—the General Council of Medi Education and Registration of the United Kingdom, give it its full though little known title—representati as it is of the Crown, the profession, the universiti and the medical corporations, is the device of governme charged with one main duty, to protect the public by raising and maintaining a high standard in profession both of conduct and of education. And it hardly be argued, in these days of great and advances in medical science and practice, that medi education ends with the first registrable qualificatio

EMPIRE RHEUMATISM COUNCIL

AT the annual meeting of the Empire Rheumat Council, held in London on Nov. 23, Lord Horder, chairman, reported that the Council's investigation the causes of rheumatoid arthritis, begun in 1916, lately been completed. At the Hospital of St. John St. Elizabeth, investigation had revealed no signific difference in allergic tendency between sufferers fr rheumatoid arthritis and control non-rheumatic subjec On the other hand, among patients suffering from rheum toid arthritis and with demonstrable allergy, the incide of infections, past or present, was much higher among non-allergic sufferers from rheumatoid the figures were 83% and 27% respectively. The nor synovial membrane had been proved impermeable the natural blood-group antibodies; but in the arth joint this barrier was broken down and the nat antibodies diffused freely into the synovial fluid. In field of postgraduate education, the Council's co at the Apothecaries' Hall had each been attended capacity.

The Council's income during the past year has £10,287, compared with £9408 in the previous year.

Public Health

POLIOMYELITIS, 1949

PRELIMINARY OBSERVATIONS

W. P. D. LOGAN

M.D., B.Sc. Glasg., D.P.H.

MEDICAL STATISTICIAN, GENERAL REGISTER OFFIC

NOTIFICATIONS of poliomyelitis in England and W during 1949 (up to Nov. 12) reached their maximum the middle of October, more than a month later th the epidemic of 1947. Though the weekly notificat are now diminishing, it will be some weeks before 1949 epidemic can be seen as a whole. Meanwh however, it is possible to study some aspects of first part of the epidemic and to make comparisons 1947.

The general shape of the curves of the two epidem —1947, and 1949 so far as it has gone—should be alrea familiar to readers from the chart published from ti to time in THE LANCET (see p. 1009). It is unnecess therefore to discuss in detail differences between general trend of the disease in the two epidemics. Inste attention will be directed towards sex, age, and regio variations in numbers of notified cases and of deaths.

Table I shows the numbers of original and correc notifications and corrected notification-rates in main geographical regions during the September quart (July, August, September) of 1947 and 1949. In 19 the region with the highest rate was North II (Cumberland Westmorland, and the East and North Ridings of York while the lowest was the South-West (Cornwa shire), while the lowest was the South-West (Cornwa

E I—ORIGINAL AND CORRECTED NOTIFICATIONS OF ACUTE POLIOMYELITIS (INCLUDING ACUTE POLIOENCEPHALITIS) N SEPTEMBER QUARTERS, 1947 AND 1949 (NON-CIVILIANS EXCLUDED); AND CORRECTED NOTIFICATIONS PER ILLION LIVING AND AS A PERCENTAGE OF ORIGINAL NOTIFICATIONS. ENGLAND AND WALES, REGIONS, AND ENSITY AGGREGATES

Area	September quarter, 1947				September quarter, 1949			
	Original notifications	Corrected notifications	Annual rate per million living	Corrected as % of original notifications	Original notifications	Corrected notifications	Annual rate per million living	Corrected as % of original notifications
ND AND WALES	6407	5298	503	83	3108	2645	245	85
·East	2487	2009	557	81	1283	1131	306	88
ater London	1594	1203	590	75	767	639	306	83
ainder of South-East	893	806	514	90	516	492	305	95
	2199	1850	559	84	863	701	207	81
th I	481	411	746	85	107	83	147	78
II	287	279	848	97	49	44	130	90
III	619	539	614	87	357	306	343	86
IV	812	621	400	76	350	268	169	77
ad	980	803	413	82	448	364	183	81
land I	715	566	439	79	245	184	140	75
II	265	237	361	89	203	180	269	89
	260	226	472	87	133	112	228	84
-West	188	168	301	89	278	252	443	91
	293	242	384	83	103	85	132	83
les I	234	184	408	79	90	72	156	80
II	59	58	324	98	13	13	71	100
y boroughs } outside Greater London	1781	1370	429	77	868	694	212	80
urban districts } outside Greater London	1794	1599	477	89	892	787	230	88
districts } outside Greater London	1238	1126	579	91	581	525	263	90

m, Dorset, Somerset, and Wiltshire). In 1949 the h-West had the highest rate, while North II was d lowest, the lowest being Wales II (North Wales). e was, however, no general tendency for regions high rates in 1947 to have low rates in 1949 or versa. For instance, the South-East had relatively rates and Wales relatively low rates in both s.

nsidering now the density aggregates (bottom of I), in both years the rates were lowest in county ughs and highest in rural districts, but the relative rence between these two types of area was rather in 1949 than in 1947.

e two columns of table I which express corrected ications as a percentage of original notifications ate, considerable differences in this respect between rent areas. For the country as a whole, the effect orrection was practically equal in the two years— in 1947 and 85% in 1949. In both years the effect orrection was less apparent in rural areas than in s, suggesting either that the accuracy of original nosis was greater in the country districts than in towns, which seems unlikely, or that less effort was made in country areas to report amendments of diagnosis; a third possibility is that in country districts amendments of diagnosis to and from poliomyelitis more nearly balanced one another than in the towns.

Table II provides a two-way analysis of original notifications during June–October in each of the two years by main regions and by type of area. The experience in the two epidemics is compared by the percentages shown in the right hand section of the table, no account being taken of possible population changes in the two years. For the country as a whole, notifications in 1949 during the 22-week period were 40% fewer than during the corresponding weeks of 1947, this proportion being approximately maintained in each of the three density aggregates. An outstanding departure from this level occurred in the South-West, where there were $1^1/_2$ times as many notifications in 1949 as in 1947, the excess being greatest (89%) in the urban districts. By contrast, notifications in the rural districts of Wales in 1949 were only a fifth of those two years before.

In all the tables cases of polioencephalitis have been included with poliomyelitis. The second footnote to

LE II—ORIGINAL NOTIFICATIONS OF ACUTE POLIOMYELITIS (INCLUDING ACUTE POLIOENCEPHALITIS) IN JUNE TO OCTOBER, 1947 AND 1949 (INCLUDING NON-CIVILIANS); AND NOTIFICATIONS IN 1949 AS A PERCENTAGE OF THOSE IN 1947. ENGLAND AND WALES, REGIONS, AND DENSITY AGGREGATES

Area	June–October, 1947 (22 weeks)				June–October, 1949 (22 weeks)				1949 as percentage of 1947			
	C.Bs.	U.Ds.	R.Ds.	Total	C.Bs.	U.Ds.	R.Ds.	Total	C.Bs.	U.Ds.	R.Ds.	Total
LAND AND WALES	2387	4190	1601	8178	1355	2628	906	4889	57	63	57	60
th-East	280	2426	415	3121	199	1600	324	2123	71	66	78	68
th	1293	1042	469	2804	673	461	162	1296	52	44	35	46
land	652	354	284	1290	364	209	133	706	56	59	47	55
t	71	100	171	342	46	86	93	225	65	86	54	66
th-West	30	106	134	270	43	200	168	411	143	189	125	152
les	61	162	128	351	30	72	26	128	49	44	20	36

Notifications in port health districts were: 1947, 9; 1949, 13.
Notifications of acute polioencephalitis as a percentage of those of acute poliomyelitis were:

	1947	*1949*
County boroughs	3·6	6·5
Other urban districts	8·9	9·1
Rural districts	10·3	8·6
Total	7·6	8·3

TABLE IV (*a*)—CORRECTED NOTIFICATIONS OF ACUTE POLIOMYELITIS (INCLUDING ACUTE POLIOENCEPH QUARTER ENDED SEPT. 30, 1947, BY SEX AND AGE WITH EACH AGE-GROUP AS A PERCENTAGE OF ALL ENGLAND AND WALES, REGIONS, AND DENSITY AGGREGATES (INCLUDING NON-CIVILIANS)

Area	MALES									FEMALES								
	All ages	0–	1–	3–	5–	10–	15–	25 and over	Not stated	All ages	0–	1–	3–	5–	10–	15–	25 and over	Not stated
ENGLAND AND WALES																		
Number	3030	111	446	397	638	468	497	433	40	2357	96	338	302	435	331	401	431	23
% of all ages ..	100	4	15	13	21	15	17	14	1	100	4	14	13	19	14	17	18	1
South-East																		
Number	1171	47	121	137	283	198	186	192	7	865	30	79	90	166	131	194	171	
% of all ages ..	100	4	10	12	24	17	16	16	1	100	3	9	10	20	15	23	20	
Greater London																		
Number.. ..	670	32	70	91	168	114	94	100	1	543	18	54	59	103	84	125	100	..
% of all ages ..	100	5	10	14	25	17	14	15	0	100	3	10	11	19	15	23	19	..
Remainder of S.-E.																		
Number.. ..	501	15	51	46	115	84	92	92	6	322	12	25	31	63	47	69	71	
% of all ages ..	100	3	10	9	23	17	19	18	1	100	4	8	10	19	15	21	22	
North																		
Number	999	43	199	163	183	138	155	105	13	873	47	196	132	152	109	94	131	
% of all ages ..	100	4	20	16	18	14	16	11	1	100	5	23	15	18	12	11	15	
Midland																		
Number	478	9	72	60	96	66	86	82	7	343	8	36	43	74	50	68	63	
% of all ages ..	100	2	15	13	20	14	18	17	1	100	2	10	13	22	15	20	18	
East																		
Number	131	6	7	13	34	27	21	23	..	99	3	8	15	15	20	15	22	
% of all ages ..	100	5	5	10	26	20	16	18	..	100	3	8	15	15	20	15	23	
South-West																		
Number	116	..	17	8	19	24	30	10	8	69	3	2	5	10	9	13	23	
% of all ages ..	100	..	15	7	16	21	25	9	7	100	4	3	7	14	13	19	34	
Wales																		
Number	135	6	30	16	23	15	19	21	5	108	5	17	17	18	12	17	21	
% of all ages ..	100	4	22	12	17	11	14	16	4	100	5	16	16	16	11	16	19	
County boroughs*																		
Number	749	27	155	103	146	106	118	91	3	629	29	104	97	112	75	98	113	
% of all ages ..	100	4	21	14	19	14	16	12	0	100	5	16	15	18	12	16	18	
Other urban districts*																		
Number	898	33	154	122	184	124	131	132	18	729	34	129	98	128	105	102	121	
% of all ages ..	100	4	17	13	20	14	15	15	2	100	5	18	13	17	14	14	17	
Rural districts*																		
Number	713	19	67	81	140	124	154	110	18	456	15	51	48	92	67	76	97	
% of all ages ..	100	3	9	11	20	17	22	15	3	100	3	11	11	20	15	17	21	

TABLE IV (*b*)—CORRECTED NOTIFICATIONS OF ACUTE POLIOMYELITIS (INCLUDING ACUTE POLIOENCEPHALITIS) QUARTER ENDED SEPT. 30, 1949, BY SEX AND AGE WITH EACH AGE-GROUP AS A PERCENTAGE OF ALL AG ENGLAND AND WALES, REGIONS, AND DENSITY AGGREGATES (INCLUDING NON-CIVILIANS)

Area	MALES									FEMALES								
	All ages	0–	1–	3–	5–	10–	15–	25 and over	Not stated	All ages	0–	1–	3–	5–	10–	15–	25 and over	Not stated
ENGLAND AND WALES																		
Number	1476	62	257	223	311	187	232	195	9	1191	61	213	176	223	134	184	194	
% of all ages ..	100	4	17	15	21	13	16	13	1	100	5	18	15	19	11	15	16	
South-East																		
Number	632	27	112	105	130	81	92	84	1	507	26	87	75	87	66	77	88	
% of all ages ..	100	4	18	17	20	13	15	13	0	100	5	17	15	17	13	15	18	
Greater London																		
Number.. ..	356	22	78	55	70	42	43	46	..	285	21	56	45	57	33	34	39	
% of all ages ..	100	6	22	15	20	12	12	13	..	100	7	19	16	20	12	12	14	
Remainder of S.-E.																		
Number.. ..	276	5	34	50	60	39	49	38	1	222	5	31	30	30	33	43	49	
% of all ages ..	100	2	12	18	22	14	18	14	0	100	2	14	14	14	15	19	22	
North																		
Number	381	18	78	46	85	45	62	44	3	324	15	56	58	67	37	40	51	
% of all ages ..	100	5	20	12	22	12	6	12	1	100	5	17	18	21	11	12	16	
Midland																		
Number	215	7	39	36	41	28	41	23	..	156	11	32	21	30	11	30	21	
% of all ages ..	100	3	18	17	19	13	19	11	..	100	7	21	13	20	7	19	13	
East																		
Number	65	1	4	9	11	13	10	17	..	48	1	7	5	11	6	12	6	
% of all ages ..	100	2	6	14	17	20	15	26	..	100	2	15	10	23	13	24	13	
South-West																		
Number	137	7	14	20	38	16	22	18	2	117	5	21	10	21	12	20	25	
% of all ages ..	100	5	10	15	28	12	16	13	1	100	4	18	9	18	10	17	21	
Wales																		
Number	46	2	10	7	6	4	5	9	3	39	3	10	7	7	2	5	3	
% of all ages ..	100	4	22	15	13	9	11	19	7	100	8	25	18	18	5	13	8	
County boroughs*																		
Number	381	18	89	55	70	60	41	45	3	313	16	64	51	55	32	43	52	
% of all ages ..	100	5	23	14	18	16	11	12	1	100	5	20	16	18	10	14	17	
Other urban districts*																		
Number	442	15	63	68	97	49	88	60	2	350	17	57	51	61	37	62	61	
% of all ages ..	100	3	14	16	22	11	20	14	0	100	5	16	15	17	11	18	17	
Rural districts*																		
Number	297	7	27	45	74	36	60	44	1	243	7	36	29	50	32	45	42	
% of all ages ..	100	2	9	15	26	12	20	15	1	100	3	15	12	20	13	19	17	

* Excluding Greater London.

II shows the relative proportions of the two forms. the country as a whole there was a small increase 949 in the proportion of cases described as polio- phalitis; this happened most in the county boroughs not at all in the rural districts.

ble III shows the age-distribution of corrected ications in the June and September quarters of and 1949 for the country as a whole, distinguishing sexes. There was practically no difference in age- ibution between the sexes at any period. Despite mall number of cases in the June quarters, the age- ibutions were similar in the two years, especially g males. There was also little difference between two September quarters. But in both sexes and th years there was a slight tendency between the

E III—CORRECTED NOTIFICATIONS OF ACUTE POLIOMYELITIS CLUDING ACUTE POLIOENCEPHALITIS) IN JUNE AND PTEMBER QUARTERS, 1947 AND 1949. PERCENTAGE TRIBUTION BY SEX AND AGE (INCLUDING NON-CIVILIANS), GLAND AND WALES

Quarter	All ages	0–	1–	3–	5–	10–	15–	25 and over	Age not stated
					MALES				
Quarter, 1947									
mber	151	8	19	24	40	21	22	17	..
of all ages ..	*100*	*5*	*13*	*16*	*26*	*14*	*15*	*11*	..
mber Quarter, 1947									
mber	3030	111	446	397	638	468	497	433	40
of all ages ..	*100*	*4*	*15*	*13*	*21*	*15*	*17*	*14*	*1*
Quarter, 1949									
mber	126	9	16	17	33	17	15	16	3
of all ages ..	*100*	*7*	*13*	*13*	*26*	*13*	*12*	*13*	*3*
mber Quarter, 1949									
mber	1476	62	257	223	311	187	232	195	9
of all ages ..	*100*	*4*	*17*	*15*	*21*	*13*	*16*	*13*	*1*
					FEMALES				
Quarter, 1947									
mber	126	4	18	25	33	17	18	9	2
of all ages ..	*100*	*3*	*14*	*20*	*26*	*13*	*14*	*7*	*2*
mber Quarter, 1947									
mber	2357	96	338	302	435	331	401	431	23
of all ages ..	*100*	*4*	*14*	*13*	*19*	*14*	*17*	*18*	*1*
Quarter, 1949									
mber	103	3	16	14	23	13	15	19	..
of all ages ..	*100*	*3*	*15*	*14*	*22*	*13*	*15*	*18*	..
ember Quarter, 1949									
mber	1191	61	213	176	223	134	184	194	6
of all ages ..	*100*	*5*	*18*	*15*	*19*	*11*	*15*	*16*	*1*

e and September quarters for a transfer of cases from age-group 5–9 years to a younger age.

able IV, which is in two parts, (*a*) 1947 and (*b*) 1949, ents the age-distribution of corrected notifications egions and density aggregates during the September rters only. Space does not permit a detailed dis- ion of the table but the data have been presented in for the benefit of those who wish to study them. nts to which attention may be drawn are the high portion of male cases at ages 5–9 years in 1949 in the th-West region (28%) and in rural districts (26%). erwise there was considerable uniformity of age- ribution over most of the country.

able V compares deaths in the 126 Great Towns, sified by regions, during June–October, 1949. It not been practicable to make a similar comparison 1947 because weekly poliomyelitis deaths were not orted in that year. Death-rates were highest in the uth-West region (48 per million) and in the South- st excluding Greater London (45 per million). Lowest es were recorded in the Midland region (20 per million) d in Greater London (28 per million). Table V also es original notifications and notification-rates (for e Great Towns only) and shows the number of deaths each region per hundred notifications. It should be noted that the deaths and notifications here are not strictly comparable, if only because a number of deaths occurred in Great Towns (e.g., in hospitals) of cases notified in areas outside the Great Towns. The effect of this has not necessarily been the same in all regions, so these deaths/notifications ratios must be accepted with caution. Nevertheless they provide some indication of the extent to which the fatality of poliomyelitis apparently varied among the different regions. Fatality so estimated was highest (26%) in Wales, followed by the East (17%) and the South-West region (16%). It was lowest in Greater London (7%) and in the Midland region (9%). Averaged over the 126 Great Towns the ratio was 11%; but, for the reason given above, this is probably an overestimate of the true fatality-rate of notified cases. The comparable ratio for 1947 is not known.

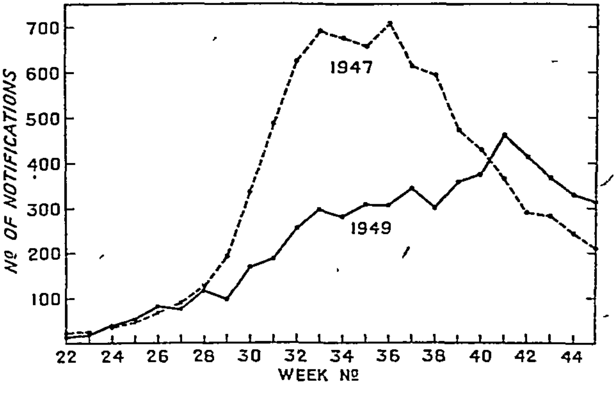
TABLE V—ACUTE POLIOMYELITIS (INCLUDING ACUTE POLIOENCEPHALITIS): ORIGINAL NOTIFICATIONS AND DEATHS; RATES PER MILLION LIVING AND DEATHS PER 100 NOTIFICATIONS, JUNE TO OCTOBER, 1949 (22-WEEK PERIOD); 126 GREAT TOWNS OF ENGLAND AND WALES BY REGIONS (EXCLUDING NON-CIVILIANS)

Great Towns in	No. of deaths	Annual rate per million living	Original notifications	Annual rate per million living	Deaths per 100 notifications
ENGLAND AND WALES	267	30	2469	281	11
South-East.. ..	107	31	1252	365	9
Greater London..	77	28	1058	383	7
Remainder of S.-E.	30	45	194	289	15
North	100	33	695	228	14
Midland	32	20	373	236	9
East	9	41	52	240	17
South-West ..	10	48	63	305	16
Wales	9	32	34	119	26

Poliomyelitis

In the week ended Nov. 12 notifications in England and Wales were: poliomyelitis 293 (318), polioencephalitis 23 (12). Figures for the previous week are shown in parentheses. Multiple cases were reported from the following counties:

London 50 (55), Bedford 6 (2), Berkshire 7 (3), Buckingham 2 (4), Chester 16 (10), Derby 3 (2), Devon 3 (3), Dorset 7 (3), Durham 3 (2), Essex 24 (26), Gloucester 6 (9), Hereford 4 (2), Hertford 4 (9), Huntingdon 5 (0), Kent 15 (16), Lancaster 26 (32), Leicester 12 (3), Lincs, Lindsey 5 (13), Middlesex 14 (17), Norfolk 7 (5), Northampton 4 (1), Northumberland 4 (2), Nottingham 9 (8), Oxford 2 (2), Salop 2 (0), Somerset 2 (11), Southampton 9 (13), Stafford 7 (3), Suffolk, East 2 (2), Surrey 6 (14), Sussex, East 5 (9), Sussex, West 1 (3), Warwick 7 (8), Westmorland 3 (1), Wiltshire 2 (1), Yorks, North Riding 2 (2), Yorks, West Riding 36 (50), Glamorgan 4 (7).



In England Now

A Running Commentary by Peripatetic Correspondents

G.P.'S PRAYER

Don't take our midder away, Mr. Bevan,
Don't take our midder away.
You've left us the chronics
And those who take tonics
And those who have plenty to say,
The aged and grumpy,
The fussy and jumpy,
So don't take our midder away.
Those merely catarrhal,
Or seeking apparel,
Add strength to the dismal array
Of myopes, bronchitics,
And osteoarthritics
—So don't take our midder away.

Removing cerumen
Demands no acumen
I've squirted out tons in my day.
Certificate-writing
Is not too exciting—
Please don't take our midder away.

* * *

If anybody thinks he would make a lovely Television Doctor, I should warn him (or her), before he rushes off to Alexandra Palace, that it is not easy. In the first place, the studio is unbearably hot; the officials are in their shirtsleeves, but as you are to be "on the screen" you must sweat beneath a thick coat. Then the muddle of microphones on lazy-arms, actors waiting for cues, cameras advancing and receding, worried-looking studio managers wearing earphones, and make-up girls all conspires to induce you to forget your lines or to repeat them in a steel-like manner. Either is fatal. If you forget your lines you must still keep talking—for there is no "retake" on television—and you will lapse for protection into a mass of clichés and string out all the words you have seen in books, like "commence" and "terminate," sprinkled with "wells" and "actuallys." You may think you can avoid this by looking down at the script all the time, but if you do you will annoy viewers just as much. The intimate yet not too breezy manner necessary for television is very hard to attain. Perhaps it comes easiest to women, but not to all of them. And as a final demoraliser, I was told: "Of course, the greatest menace is the person who will make jokes; poor thing, he doesn't realise how annoying he is to all concerned." After that I crept out over the cables and walked down the stairs. As a peripatetic correspondent, I felt I could not ring for the lift.

* * *

It is rather strange that although our profession includes one or two outstanding orators who can successfully compete with speakers from any intellectual sphere, medical men are with rare exceptions deplorably bad in presenting communications at society meetings. Their knowledge may be profound; but they appear to lack the most elementary notion of preparation for an audience. Eloquence is not demanded, nor is mellifluent sonority, but the usual mumbled or muttered monotone which tails off into complete inaudibility at the end of every sentence is a wretched ordeal for those of their audience—and they comprise a fair proportion—who must admit to be what is euphemistically called a little hard of hearing.

The stereotyped instruction (or even order) to restrict themselves to 15 minutes has little or no influence on speakers, who might almost require an almanac rather than a clock for their regulation. The unhappy chairman writhes impatiently, divided between a hesitancy to give offence by abruptly terminating a discourse and his obligation towards others who are entitled to participate. Recently I encountered an example who at the end of 16 minutes had not emerged from the stage of self-introduction, and who after another 20 minutes expressed resentment at a reminder from the chair that even if he was a protagonist he was not the entire caste. Speakers should pay their audience the compliment of preparation, though admittedly this means considerable trouble. The subject matter abridged, pruned, polished, and repeatedly against the watch until a maximum of 14 minute ensured. As a golden rule, it is far better to say n little than a little too much.

A guide and warning are provided by Mark experience. He had wandered by chance into a hall and heard a preacher soliciting funds for a intention. At the end of 10 minutes so moved w by the sentiments that he resolved to realise possessions and donate the proceeds. After a 10 minutes he decided that the loose silver in hi would suffice. And when after another 10 min collection plate reached him, he abstracted tw for his own expenses.

* * *

I cannot leave unchallenged my fellow corresp note of Nov. 19 (p. 958) on the short-term r quassia clysters. When I was a student in B there was another student who had a peptic ulc Kretchmer, he was of pyknic build and sociable tion, which went badly with his physician's ord bland diet, solid and fluid. After abstemiously wi a succession of those gloriously "wet weekends punctuate the American student's otherwise existence, he was goaded into rebellion. On t occasion he guaranteed his conviviality by mea Higginson and a bottle of port. Port, I ima deference to the Oslerian tradition, for his objec have been attained with more domestic liq uncertain origin but unquestioned potency. Or caution may have informed this choice. At a there was leisure for repentance, for he was r with a "regular" hangover and an intractable p He was thereafter quoted as an example of bur candle at both ends.

* * *

The other morning, while I was shaving (w when my most brilliant ideas come to me), I w dering whether a perfectly fresh clouded yellow *croceus*) I had recently caught was an immigrant been born in this country. Having no net at t I had caught it by gripping one of its wings betw left index and left thumb as it perched imbibing Michaelmas daisy, and a perfect mirror image of pattern had been impressed on my thumb. That su that the insect had just emerged, and then I reme that the pigments of butterflies are often pteri that pterins are being tried in the treatment of and leukæmia. Had anybody thought of butterfl as a source of pterins for that research? Less th hours later, almost the first medical journal that I up (the *Journal of the Philippine Medical Ass* for June) contained an article on the successful an extract of the wings of a Philippine butterfly, *hecabe*, to kill the plasmodia of malaria, the substance being a pterin. So much for my brillia —and for Mr. Piddington.

* * *

A hitch in air travel reveals the strangest among those misguided enough to indulge i pastime. For unexplained reasons, B.E.A. deci cancel its service to Amsterdam but said that, of passengers to that place, three might travel first K.L.M. service and three by the second, same day. In the friendly dispute that follo Dutchman revealed that he had to get to urgently because he was importing eight elephan there would be no-one there to receive them. his priority!

* * *

Pondering on the shortage of nurses while waiti one to chaperone me, I noticed my H.P., a young happily disappear into a cubicle to examine a young labourer. Here, I thought, is another unpublished advantage in having women doctors. reflections made me realise the flaw in this argu surely the labourer should demand a chaperone. he did, should it be another man or a woman? Pe Mr. Bevan will create another class of hospital servants to fulfil this need.

Letters to the Editor

THE HEALTH OF NURSES IN HOSPITAL

R,—I should be glad if you could spare a corner of correspondence columns not occupied by theo- al controversy (Deus, Paley, and Fisher *v.* Voltaire, on, and Platt) to allow me to congratulate Dr. Court is admirable article in your issue of Nov. 12, and also sk your powerful support for a solution of the lems that he raises.

ere are no doubt some things which are better under the National Health Service, but the medical of nurses in hospital is certainly not one of them. hospital which I serve it has been the admirable ition that the junior physician should act as physician- arge of the nursing staff, and it was established by two predecessors that the capitation fees were ved by the institution and paid into a nurses' are fund. Since July 5, 1948, such an arrangement een impossible. The Minister insists that the medical of nurses in hospital is a general-practitioner service, that the medical officer must be under contract the local executive council and hold a "limited list" iving 10% less than the usual capitation fee). It is ous to anyone who has had experience of this work, equally plain from a reading of Dr. Court's paper, much of the work required in the medical super- n of nurses lies altogether outside a general-practi- r service. The work is comparable to the medical vision of children in boarding-schools or of workers zardous industries; and it has long been recognised special arrangements outside the National Health ice are required for such services. During the last teen months I have endeavoured to get this point iew accepted by discussion with my colleagues, ugh the British Medical Association, at the regional ital board, and by correspondence with a friend in Ministry of Health, powerful, well-intentioned, and ressive. All these approaches have failed; the ssus has not lifted his potent finger, while his pheral servitors, clamouring insistently for their ificates to be signed, have ultimately compelled refusal to do business with them.

ere is a suggested solution on which I should value criticism and that of your readers. The Minister ld instruct boards of governors and management mittees to proceed to the appointment of a physician- harge of the nursing staff in all hospitals. The t status of this physician should not be laid down; n he will be the junior physician on the staff of the pital; sometimes he will be a family doctor; seldom he be a medical registrar, junior resident physician, esident medical officer—not that this last group is hout the necessary enthusiasm or experience, but are men on the move and some continuity of medical is essential in this work. In some areas the physican ointed will have the medical care of nurses in a group hospitals. The appointment should be made on joint recommendation of the matron, the nursing ncil, and the medical committee of the hospital cerned. The board of governors or management mittee should pay the physician a salary represent- a capitation fee of not less than £2 per annum for h nurse, an arrangement being made that the capita- n fees for these nurses should be the property the board of governors or of the management nmittee.

Although the exact status of the physician should t be laid down, yet the standard of medical care pected in all hospitals should be defined in detail. e time of routine examinations, the frequency of X-ray examinations and blood-counts, the nature of prophylactic and diagnostic procedures, the form of records to be kept, and so on—all this should be determined centrally after consultation. The matter has some urgency since the Ministry is (rightly though tardily) planning to include nursing staffs in a controlled B.C.G. experiment. It is illogical to take central action in this relatively limited field while more important aspects of the health of nurses remain unconsidered. Moreover, the organisation of the B.C.G. experiment itself would have been facilitated if the general medical care of nurses in hospital had first received attention.

Derby. DOUGLAS HUBBLE.

SIR,—Dr. Court's excellent paper in your issue of Nov. 12 gives me the opportunity of reporting a short investigation that has been carried out at the Queen Elizabeth Hospital during the past three years.

Shortly after the war some concern was felt regarding the number of nurses developing pulmonary tuberculosis, and it was thought that one possible source of infection might be a higher than normal incidence of unsuspected open tubercle amongst hospital patients. With this idea in mind it was decided to examine clinically and radiologically the chest of every patient admitted to one of my surgical wards (34 beds); and the sputum was tested for tubercle bacilli.

During the thirty-five consecutive months admissions totalled 1908. Of these patients 35 showed positive X-ray findings and had positive sputa; but 28 of them were cases of known pulmonary tuberculosis admitted for surgical treatment. Thus the number of general surgical patients with hitherto unsuspected open pulmonary tuberculosis was 7 —i.e., 0·37% of all admissions. The "thoracic" cases were all nursed in special side-wards, with special precautions laid down by the physicians; but without special investigation these 7 would probably have escaped recognition, since their coughs were minimal and their general state of health appeared satisfactory.

In addition, there were 14 general surgical patients with positive X-ray findings but negative sputa. On admission these were presumably of no danger to the nursing staff but they might become so should they develop postoperative chest complications; and they themselves might fare ill in such an event. In any case, according to the phase of the lesion, some active treatment might be called for.

It may be said, then, that the population of the average hospital surgical ward carries no higher incidence of open tubercle than does the general population—i.e., about 4 per 1000. Nevertheless, any unsuspected open case lying in the general wards of a hospital is a potential danger. Some would argue that these could be discovered by routine sputum tests instead of by routine radiological examinations, but this would throw an insupportable extra burden on the laboratories. Had only routine sputum tests been carried out, the 14 with positive X-ray findings but negative sputa would have been missed, since the majority were without symptoms and pathologically quiescent. Moreover, an active tuberculous lesion may be associated with no sputum or negative sputum; and those who maintain that such a lesion should be recognised in a surgical ward solely by routine clinical examination ' flatter their surgical colleagues, perhaps because their own line of work no longer puts them to such a test.

The only solution to this problem is routine X-ray examination of all admissions, and for economy this should be with the miniature apparatus.

Department of Surgery,
University of Birmingham. F. A. R. STAMMERS.

SIR,—Dr. Donald Court quotes my findings, which you published in a letter in 1943, on the health of 59 tuberculous nurses whom I had been following up. I am now able to add some further details about the same group, and to compare their position in 1942 with their state today:

	1942		*1949*	
Dead	8		14	
Ill (at home or in hospital) ..	18		1	
Working in hospitals	4	17 nursing	2	12 working
Working in sanatoria	13		8	
Private nursing	—		1	
Nursing in convalescent home..	—		1	
Working, but not nursing ..	1		3	
At home not working	8		14	
Lost sight of	7	(3 probably dead)	15	(3 probably dead)
Total	59		59	

It will be seen that 6 more are known to have died, and there may have been other deaths among the 15 whom I have not been able to trace. Only 15 are now working, as against 18 in 1942. Of 14 at home, not working, 2 are married and well, 4 (of whom 3 are married) are semi-invalids, and 5 are living with their parents and helping in the house.

Between 1943 and 1947 I collected information about a further 80 nurses. I have lost sight of 31 of these; but, of the remaining 49, 8 are dead, 4 are ill in sanatoria or at home, 8 are at home not well, 3 are married and not well, 3 are married and well, 16 are nursing full-time (11 in sanatoria, 5 in hospitals), 3 are nursing part-time (1 in a sanatorium, 2 in hospitals), and 4 are working but not nursing. No figures have been published about this group before.

London, S.W.6. E. D. Andrews.

MEMORIAL TO SIR JOHN FRASER

Sɪʀ,—Some months ago you granted us the courtesy of your columns to announce the opening of a fund to establish a memorial to the late Sir John Fraser, formerly regius professor of clinical surgery and principal of Edinburgh University. It is our intention to close the fund on Dec. 3, and those who may still wish to contribute are reminded that subscriptions should be sent before that date to the treasurer, Mr. John Bruce, F.R.C.S.E., at the Department of Surgery, the University New Buildings, Edinburgh.

Edward V. Appleton
James M. Graham
Frank E. Jardine
James Learmonth.

VACANCIES ON MANAGEMENT COMMITTEES

Sɪʀ,—In your issues of Nov. 12 (p. 922) and Nov. 19 (p. 951) you draw attention to a circular on this subject issued by the Ministry of Health.

There is one important interest of the community which is commonly overlooked in the constitution of management committees. I refer to hospital matrons, who, as a group, comprise women of intelligence and integrity with as important a contribution to make to the administration of hospital services as have medical men. In fact, there is scarcely any aspect of hospital organisation on which a matron has not got a point of view worth hearing. Some management committees invite a matron to attend and to express an opinion; but she has no voting power. Many will say that the vote is not important, but I believe that its absence is an insult to a group that comprises many great women. Some management committees merely invite a matron to attend when something of particular interest to her is being discussed. This is absurd; for who is able to decide what is, and what is not, of interest to a matron?

I know that I shall be told that hospital matrons are being encouraged to take part in the work of the house committees. This obviously is not enough. Moreover, the argument that matrons cannot take part fully in the business of management committees because they are paid officers of the committees is one which should be eliminated as in the case of medical staffs. Certainly the matron of every hospital with over a hundred beds, even if she is appointed by the management
should be regarded as a direct employee of the
board. These matrons should be represented
inclusion of one in the membership of each
committee.

Exeter. Norman Ca

THE DUMPING SYNDROME

Sɪʀ,—After reading your correspondent's acco
his disability (Nov. 12, p. 907), I imagine tha
conscientious practitioner will think twice before p
his ulcer patients in the hands of a surgeon.
patient has indeed endured a regrettable series o
fortunes, and I sympathise with his wish that h
retained his ulcer and his stomach—a sentime
doubt echoed by his surgeon.

There has lately been a good deal of interest
dumping syndrome; and whatever its mech
I am sure that its frequency has been exaggerat
cannot agree that this complication affects a con
able proportion of gastrectomised patients, and I s
that the severe grade experienced by the writer is
uncommon; certainly we have not seen an ex
in the last couple of hundred resections carried
this unit. It would be wrong to allow i
albeit unfortunate—experience to darken the
of an operation which, in hands accustomed
performance, is as safe as any comparable proc
and which has so many benefits to offer. In my e
ence chronic ulcer cases submitted to partial gastrec
are most grateful patients, and I regard it fro
points of view as one of the more satisfactory opera
in surgery.

West Middlesex Hospital, Isleworth. Louis A. I

CONTROL OF TUBERCULOSIS

Sɪʀ,—I have read with interest the varying poi
view expressed on this subject, and am a little dism
at the gulf which appears to be fixed between
sanatorium doctor and chest physician.

Surely Dr. Caldwell (Nov. 12, p. 910) has got t
root of the problem by emphasising the necessit
the chest physician to have charge of the patient
notification right through to rehabilitation. If all
physicians cannot yet have their own beds, they sh
at least have control of admissions to blocks of
in the various institutions where their patients
treated, a proportion of the beds of each type b
allocated to each clinic within the region. Only a s
proportion of the total beds need then be reserved
filling by the regional board. By keeping consta
under review his own waiting-list, the chest physi
could adjust the relative priorities for hospital admis
which change almost daily. Better use would the
made of the limited number of beds, and with pers
control of his waiting-list the clinic physician w
be careful not to block beds by admitting a pat
to the wrong type of institution. Too often, by
time a patient is admitted his condition has chan
radically for better or worse, and it has now bec
notoriously difficult to arrange transfers from
hospital or sanatorium to another, even within
same region.

If carefully supervised, the enforced period of wait
need not necessarily cause great harm to the patie
nearly all will benefit from a preliminary period of st
bed rest, which can often be made possible by the c
certed effort of the chest physician's team. Po-tu
reduction of cavitating disease may be gratifyin
successful when carried out at home under close sup
vision, and pneumoperitoneum is an innocuous fo
of mechanical treatment which may help in controll
acute disease. It is, of course, important that the ch
physician should be enabled to admit patients for 48 hou

phrenic crush, and also for bronchoscopy—an tigation without which rational treatment often ot be planned.

. Jeanes (Oct. 29) doubts the possibility of giving tomycin at home. In this area it is done success- . in suitable cases, by the district nurse giving tions of 1 g. daily for 6–8 weeks, a course of para-osalicylic acid being administered concurrently e hope of delaying streptomycin resistance.

th adequate rest some patients will improve to a i-ing extent, and hospital treatment can be post-d or even avoided. Others will improve so much me that they become treatable by collapse therapy dmission to hospital, provided that by juggling his waiting-list the supervising physician can ge admission to hospital at the right moment. there will be those whose progressive disease and of resistance, poor home conditions or difficult erament make hospital treatment a matter of grave cy. Yet such patients may have to wait many ts for admission and may become untreatable. beds are cluttered up with chronic or hopeless which would do just as well, or as badly, at home.

tile admiring the courage of those who induce mothoraces in the home I feel that unless general itals immediately open 5% of their beds to cases of onary tuberculosis, the only possible solution e present bed shortage is the acceptance by sana-m physicians of a shorter term of stay for their nts. Rather than strive by prolonged sana-m treatment to render the disease of a few inactive. bmit that, as a short-term policy, we should aim aking the greatest possible number of persons sputum-tive, and leave convalescence where possible to the of the chest physician. More use might also be e of outdoor shelters for chronic open cases, and authorities could help to solve the problem of the growing band of "Homeless Hectors" by the ision of hostels and night sanatoria.

e tuberculosis physician has a great task and t opportunities. The value of his work to the munity has been recognised by the conferring of ialist and consultant status and the provision of far er facilities than ever before. In his aim of con-ing tuberculosis by finding and treating or isolating active cases, and employing general hygienic and ific prophylactic measures, he is assisted by a large n which includes the family doctor, thoracic surgeon, ical officer of health, tuberculosis health visitor, rict nurse, home-help supervisor, children's officer, sing manager, occupational and vocational therapist, disablement rehabilitation officer. If the members his team work together with a will, theirs, in the end, be the victory.

caster House, Chest Clinic,
Southend-on-Sea.

E. G. SITA-LUMSDEN.

IR,—In the recent correspondence on this subject, the ous writers were mostly concerned with the manage-t of cases amenable to treatment. No mention has n made of the advanced cases, for which, because the shortage of beds, sanatorium treatment is not templated.

n most areas a priority system of admission to atorium operates, and of course medical superinten-its do not like to see their beds blocked with cases which very little can be done. It is forgotten that, t at home, the advanced cases are most dangerous a source of infection. Any chest physician could e countless examples of contact infection due to se people being left at home in unsuitable surroundings, len they should have been in hospital. Here again e shortage of beds operates, but this could be overcome using some of the infectious-diseases hospitals for this purpose. For instance, in one area, where there are three such hospitals in a five-mile radius, the average daily occupancy of beds in 1948 was as follows:

Hospital	*Bed complement*	*Average occupancy*
A	36	10
B	32	3
C	30	4

These hospitals are usually fully staffed, and no greater skill is required in nursing tuberculosis than other infectious diseases. With a little equipment these hospitals could admit, under the care of the chest physician, early as well as advanced cases. In this way, the number of early cases on sanatorium waiting-lists would be reduced, and they could admit a greater proportion of advanced cases.

I am well aware that this is not an ideal arrangement, but it is certainly better than leaving the patient in a home where very few or no precautions are taken, or can be taken, against the spread of infection.

Newcastle-on-Tyne.

WILLIAM ROZNER.

SIR,—The greatest immediate problem regarding tuberculosis in the U.K. is the shortage of sanatorium beds.

A Ministry of Health statement (March, 1949) declares: "The reason for this is not the lack of sufficient accommodation but the persisting shortage of nurses." Many of the empty beds could be used by the further dilution of present nursing resources, as suggested by Dr. Bentley [1]; by a greater use of patient help; and by the affiliation of general training schools for nurses with sanatoria. Such affiliation should enable every trainee to have three months' experience, unobtainable elsewhere, of the most important disease affecting young adults.

The Ministry's statement overlooks, however, the basic fact that in the U.K., compared with other countries with high standards of public health, there is a great and absolute insufficiency of beds. The following table, giving approximate figures for 1948, is interesting in this respect:

Area	*Population, millions*	*Tuberculosis Death-rate per 100,000 (all forms)*	*Tuberculosis Ratio of beds to total deaths*
Denmark	4·0	25·0	5 : 1
Holland	9·5	28 0	3 : 1
U.S.A.	143·4	30·0	3 : 1
Canada	12·9	37·1	3 : 1
Ontario, Canada	4·3	19·2	4 : 1
England and Wales	41·6	52 9	Staffed—1·3 : 1 If fully staffed—1·6 : 1

The ratio for Holland does not include over 400 beds in Switzerland, fully or partially subsidised. Belgium, whose bed problem at home is the same as that of the U.K., subsidises, partly or fully, about 780 beds in Switzerland. Although £5 million was allowed for tourists to come to Switzerland this year, the U.K., with its much greater population and tuberculosis problem, does not use, officially or semi-officially, treatment facilities in Switzerland.

In September I visited Leysin and Davos. I found there were, mostly in these two centres, 1000 empty beds which can be staffed. If only half of these were occupied by British patients, each for an average of six months, 1000 more patients a year could receive sanatorium treatment without delay. But, as the pound sterling has less than half of its 1930 exchange value in this country, the subsidies, which used to be paid by many local authorities for private treatment in Switzerland, would have to be restored. Such subsidies could be based, as they were before July, 1948, on the cost of treatment in the U.K., and suitable patients selected by the regional medical specialists.

Among the quarter of a million people suffering from active tuberculosis in the U.K., there must be at least

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1. Bentley, F. J. *Lancet*, 1948, i, 722.

five hundred who, with the help of these grants, could afford sanatorium treatment in Switzerland. If 500 beds were occupied continuously, the total amount of hard currency involved would be less than £450,000 in one year, of which about half would come from public funds. The new health Act, which is supposed to provide "free treatment for all," handicaps the tuberculous patient, who could formerly, with the help of the subsidies, receive immediate treatment in a private sanatorium.

Since the Ministry of Health cannot provide treatment, except after long delays, the grants should be restored to enable some patients to arrange their own private treatment.

Montana Hall, Montana,
Switzerland. HILARY ROCHE.

BEDSIDE LOCKERS

SIR,—I have read with considerable interest, and no little amusement, your leading article of Oct. 22 on the draft British standard for hospital bedside lockers. But while I respect your views, I am bound to say that in framing them you seem to have fallen into the common error of supposing that all that is needed to design a locker (or indeed, anything else) is "a little commonsense." If it were not for the eccentric ideas of these designers, your argument seems to say, it would be the simplest thing in the world to construct a locker which would meet all the requirements and satisfy everybody.

In fact, of course, it is well known that there is no sort of agreement on this matter among the different hospital authorities. So the problem becomes one of reconciling many divergent opinions by the introduction of a few obviously desirable improvements, and for the rest leaving the individual hospital free to express its own ideas.

Not having served on the B.S.I's. committee, I cannot say with what ideas they may have embarked on their inquiries; but it seems fairly clear from their conclusions that they very quickly gave up any hope of arriving at the "ideal" hospital locker. Instead, they have wisely limited their recommendations to those particular points of design and construction about which some useful measure of agreement could be found to exist. When they say, therefore, that "compartments with doors are preferable to drawers," they do not deny the usefulness of drawers, but merely point out that a majority of hospital authorities prefer compartments. Similarly with the decision to discourage the provision of urine-bottle compartments. For the rest, they have sensibly left a wide measure of choice to the individual hospital, concentrating their attention on such indisputable considerations as the need for sturdy construction, mobility, and heat-resisting surfaces.

Industrial Design and
Development Ltd.,
26, Albemarle Street, London, W.1. FRANK MORTIMER.

PRINCESS TSAHAI MEMORIAL HOSPITAL

SIR,—May I appeal to your readers for contributions towards the funds of this hospital?

When the Emperor of Ethiopia, Haile Selassie, was driven from his country by the armies of Mussolini, Princess Tsahai, a girl of 17, came into exile in Britain, and at once sought work as a probationer nurse, so that she might be able to serve one of her country's greatest needs when liberation came. She was not very strong, and a nurse's training is hard, but she had all the qualities of a good children's nurse: her matron wrote: "Guy's Hospital will remember her as one of whom it will always be proud." She was at Guy's when it was bombed during the war.

Ethiopia was liberated, and Princess Tsahai returned to her country, after five years' service as a nurse in Britain, to find friends and relatives dead, thousands of homeless, maimed, and wounded, and thousands of orphaned children thronging the streets. She opened a home for the orphans, clinics, and dressing-stations, giving her knowledge and all her strength to the service of the sufferers. Then she married, and went with her husband to a remote district, where she at once opened a dressing-station, and had dreams of a but, working too hard, she was struck down and died age of 22, lacking the skilled help she had devoted bringing to others.

It was to commemorate her life that some of us build a hospital in Addis Ababa to her memory—a with wards for children and maternity, and with for teaching and training.

We set out to raise £100,000, and have so far £85,000. The hospital is built and partly equipped; we want £15,000 to complete the enterprise. Those who will be doing something to show in a foreign and backw country that the English-speaking race believes in m pity, and loving-kindness—the qualities of which a hos is the finest possible outward and visible sign.

Donations should be sent to the hon. treasu Lord Horder and Lord Amulree, c/o Messrs. Gould Prideaux, 88, Bishopsgate, London, E.C.2, the hono accountants, who will gratefully acknowledge receip

WINST
Chairma

REGISTRARS

SIR,—As a registrar with experience in a hospitals, I wish to thank you for your leading last week. I would, however, like to add to what been said.

There seems no doubt that the cash value of em ments is going to be raised. Two principles, I th need stating:

1. The cash value of emoluments should not be more the actual cost to the hospital of the services provided. not think that hospitals are justified in making a profi of registrars.

2. There should be no sliding-scale of emoluments depe on the income of the registrar. A man can only be exp to pay for what he gets, and not for what he theoret might be expected to get. In one hospital it has suggested that a resident registrar should pay £170 a for his board and lodging. This is 27*s.* a week more t houseman pays, and it is not possible in this part hospital to find accommodation which would justify difference. In another hospital a registrar is being ask pay more for a bed-sitting room and his meals in the do dining-room than the matron is charged for a flat an meals brought to her.

Emoluments are important, but more important are a registrar's prospects. The crux of this probl consultant establishments, for on the work and resp bilities demanded of a consultant depend the nu of registrars and the responsibility they are exp to take. If a consultant is responsible for too beds, his registrars will in effect be doing const work without the status of pay. Furthermore, s consultant will probably have to have more regi under him than a consultant with less responsib These registrars will be working under a double disa as they will also be lowering their overall chances consultant post.

There is at present, when selecting registrar consultant posts, a very definite prejudice ag registrars from ex-local-authority hospitals. Regis in these hospitals, even when the bed: consultant is reasonable, nearly always take greater and arduous responsibilities than registrars of an equiv grade in other types of hospitals, particularly tea hospitals. Their practical experience in both cl and social problems is, because of their work, al always greater and better balanced than that of who have not stirred from a teaching hospital. standard of work in many ex-local-authority hos is very high, despite difficulties comparatively unk in teaching and ex-voluntary hospitals. Nevertl registrars in ex-local-authority hospitals are at a disadvantage when competing for consultant probably because they do not know the right pe his disadvantage is made even more unjust by the sively high bed : consultant ratio that is nearly rs found in these hospitals.

is issue of bed : consultant ratio has not yet been . Why, for example, is a full-time physician ted to be responsible in one area for 400 beds, in er for 150, and in yet another for 60 ? I can vouch ese figures. Until there is some generally accepted ard for consultant establishments there is no hope easonable consultant : registrar ratio or of reason- prospects for registrars. Unless something is done the results of the present situation will be disastrous oth the public and the profession, and the cleavage een the ex-local-authority and ex-voluntary hospitals greater than in the past.

Eicoi.

CURARE AND PRECIPITATE LABOUR

—Why does Dr. Rollason, in the case reported im last week, attribute the increase in uterine tone finitely to curare ? It was not the only drug em- ed. What other effect upon uterine tone is to be cted, for instance, from 10% cyclopropane, which also administered ?

Forest. MICHAEL D. NOSWORTHY.

MEDICAL BIOPSIES

—In your annotation under this heading last week id : " Of late years great strides have been made in techniques of aspiration, or needle, biopsy." What, may I ask is a " medical biopsy " ; what are we to ine that an " aspiration, or needle, biopsy " can be ; wherever are we to find these " great strides in niques " ?

it possible that you assume that had Shylock been to secure hæmostasis he would have performed a biopsy," or is your distinction merely one of dress reby the excision of a lymph-node by a doctor in shirtsleeves is medical, but if he puts on his " full ative panoply " (or takes reasonable aseptic pre- ions) it is surgical ? Have such great technical strides made that we can now see with the eye of a needle ? perhaps we need not yet despair of the aspirations he camel.

o Sir ! Biopsies are examinations of the living, as necropsies are examinations of the dead, and usually made by pathologists, often with the help of roscopes. Pieces of tissue are being removed more uently from tumours, bone-marrow, liver, and spleen biopsy with a resulting valuable increase in diagnostic ision. The development of a few gadgets for this pose, however, hardly constitutes " great strides in niques." The editorial blue pencil should be employed help us maintain both a sense of proportion and a ard for the meaning of words.

yal Cancer Hospital,
London, S.W.3.

D. W. SMITHERS.

* Professor Smithers exposes a deficiency in the tor's vocabulary. By usage the " medical treatment peptic ulcer " has a limited connotation, and none ld suppose that by this was meant medical, as posed to lay, treatment. In the present instance any biguity in the title is surely dispelled by the opening tence of the annotation, which Professor Smithers otes. Just one of the " gadgets " to which he refers caused radical change in our conception of the galoblastic anæmias. We fully agree with our respondent, however, that all biopsies are less medical d surgical than pathological.—ED. L.

THE DOCTOR'S CREED

The concluding letters in this correspondence will pear next week.

Parliament

New Clauses to Amending Bill

WHEN this Bill was considered in committee in the House of Lords on Nov. 17, Lord SHEPHERD moved the new clauses tabled by the Government.[1] The purpose of the first, he explained, was to add to the authority of the Medical Practices Committee. At present its functions were limited technically to granting applications by doctors not yet on a medical list, for inclusion in that list. But it was important that the committee should have authority to look at all applicants. For instance, when a doctor on the list desired to appoint an assistant and the executive council for his area refused the appointment the doctor should be able to appeal to the Medical Practices Committee. The second clause, giving statutory authority for the proposal to make a charge for prescriptions, was drafted, Lord Shepherd pointed out, in general terms because the exact nature of the arrangements to be made had not yet been settled. But the charge would not exceed 1s. and old-age pensioners would be exempt. War pensioners would continue to receive free treatment for their pensioned disabilities. The object of the amendment was twofold : it was to act as a deterrent to excessive or unnecessary resort to doctors and chemists, and to reduce expenditure. Eventually it might be possible to tackle these problems on other lines. The Central and Scottish Health Services Councils had set up a joint committee to advise whether it was desirable and practicable to restrict or discourage doctors from prescribing medicines of doubtful value or of unethical character, and unnecessarily expensive brands of standard drugs. The joint committee consisted of members suggested by the Standing Medical and Pharmaceutical Advisory Committees of England and Wales, the Scottish Medical, Pharmaceutical, and General Practitioner Services Advisory Committees, the three Royal Colleges, the Scottish Royal Medical Corporations, the British Medical Association, the British Pharmacopœia Commission, and the Society of Apothecaries. It was too early to say what might be found possible on these lines, but it was conceivable that general acceptance of a list of drugs of recognised value, with the corollary that a doctor would be expected to justify the prescribing of any not so recognised or of unnecessarily expensive brands of recognised drugs, would in the long run be the better way of handling the problem. The clause was permissive and would enable the Minister to vary conditions governing these practices.

Lord LLEWELLIN asked for an explanation of the term " unethical " medicine. The powers given under the clause were wide and the regulations would have to be watched when they were issued. He did not know whether the line of 1s. per prescription would work in practice. He was told that 70% of the prescriptions made under the National Health Service were not handled by the pricing-bureau, and if there was to be a charge of 1s. for every prescription a much larger staff would be needed in the pricing-bureau, unless the intention was to make an average adjustment, as apparently had been done so far under the Health Acts. Was the price to be per prescription or per item on the prescription ? He urged that some provision should be made for people who had to take a drug, such as insulin, regularly. Lord SHEPHERD said he hoped the regulations would be issued before long. Of course there would have to be consultations about them. Not only would the question of prescribing be reviewed by the joint committee, but there would also be consultation with the professional organisations about the details of the scheme for the recovery of charges. He admitted the difficulty of interpreting " unethical medicine " but tentatively suggested that unethical treatment by the supply of drugs appeared to be something that stimulated the emotions. As to Lord Llewellin's statement that 70% of the prescriptions were not handled by the pricing-bureau, an attempt was being made to secure a fairly inexpensive administrative system. The point about the repetition of prescriptions for a given complaint would receive consideration.

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[1] See *Lancet*, Nov. 19, p. 968.

Finally Lord Shepherd moved the third new clause giving power to make regulations to charge for any use made of the National Health Service by people not ordinarily resident in this country. He said that reasonable use of our health services by those who fall ill when visiting this country was, in the Minister's view, a part of hospitality; but abuse by people who perhaps came here mainly to take advantage of a free service for which we had to foot the bill, was quite another matter. This clause was meant as a power to check abuse.

QUESTION TIME

Medical Education

Mr. **Somerville Hastings** asked the Minister of Education to what extent suitability for the profession, as apart from scholastic attainments, are taken into consideration in selecting students for scholarships and maintenance grants for training for the medical profession; and what steps were taken to assess this.—Mr. **George Tomlinson** replied: The assessment of suitability of candidates for the medical profession is mainly a matter for the medical schools, acceptance by which is one of the conditions of an award by my department or local education authorities.

Mr. **Hastings**: How many medical students are now in receipt of scholarships and maintenance grants provided by the State and local authorities, respectively, in England and Wales; and how many were in receipt of similar awards in 1938?—Mr. **Tomlinson** replied: At present 3071 awards by my department to medical students are current, of which 2634 are under the Further Education and Training Scheme. The comparable figure for 1938 was 29, all of which were State scholarships. I am unable to state how many of the awards by local education authorities are for medical students.

Mr. **Hastings**: What is the cost of medical education in England and Wales borne by your department?—Mr. **Tomlinson** replied: The expenditure on medical education falling on my department is confined to awards to students. The estimated cost in the current year of awards made direct by the department is about £814,000. A substantial part of the expenditure by local education authorities on their awards to medical students is met by my department, but figures of this expenditure are not available.

Cost of Prescriptions

Dr. A. D. D. **Broughton** asked the Minister of Health what was the average cost of National Health Service prescriptions; how much of that amount was dispensing fee; and how much the cost of container.—Mr. **Aneurin Bevan** replied: The average cost of National Health Service prescriptions in England and Wales is at present about 3*s*. Of that amount 1*s*. ½*d*. represents the average dispensing fee and 1½*d*. the average cost of containers.

Mr. **William Gallacher** asked the Minister what consultations had taken place between him and representatives of the pharmaceutical industry in order to see how prices could be lowered to lessen the charge of prescriptions.—Mr. **Bevan** replied: The prices to be paid for drugs supplied on National Health Service prescriptions are agreed between my department and the Central National Health Service (Chemist Contractors) Committee and are reviewed monthly. Significant reductions have been obtained in certain fields.

Mr. **Gallacher**: In view of the very great rate of profit made on some of these medicines would the Minister consider publishing a statement giving in detail the cost of various popular medicines and the profits being made out of them?—Mr. **Bevan**: I would not have the information.

Mr. F. W. **Skinnard** asked the Minister what percentage of the prescription forms dealt with by the pharmaceutical pricing-bureaux carried a single prescription, and what percentage more than two.—Mr. **Bevan** replied: Precise data are not available. Evidence before me suggests that the average percentages are about 60% and a little under 10% respectively.

Dispensing by Doctors

Mr. **Skinnard** asked the Minister what proportion of medicines prescribed under the National Health Service was dispensed by doctors.—Mr. **Bevan** replied: No precise information is available, but the estimated proportion supplied by doctors under part IV of the National Health Service Act is a tenth.

Dentists in the N.H.S.

Dr. **Broughton** asked the Minister what was the n dentists serving in the National Health Service on J 1948; and what was the latest available figure.—Mr. replied: 4562 and (on Oct. 1, 1949) 9468.

Hospital Accommodation

In answering a question on this subject Mr. **Bevan** that it was not intended to make any reduction in the c programme of the health service.

Calorific Value of Prison Diets

Mr. J. A. **Boyd-Carpenter** asked the Home Sec if he would state the average daily caloric value of th consumed at the latest convenient date by the inmates Majesty's prison, specifying any differences that there be in the cases of different classes of prisoners.—Mr. C **Ede** replied: The over-all average calorific value of diets on Nov. 8, 1949, was 3192. Particulars for the v classes are given as follows:

Local Prisons	Men	3126
	Women	3015
Regional and Central Prisons ..	Men	3438
	Women	301
Young prisoners	Boys	[illegible]
	Girls	31

A Second Opinion

Dr. A. D. D. **Broughton** asked the Minister of Insurance what persons were empowered by his to refer cases to regional medical officers for a second opinion.—Mr. **James Griffiths** replied: The empower me to require sickness benefit claimants to examination for a second medical opinion. The local manager refers the cases selected to a senior medical of the health department who consults the patient' doctor when deciding whether a case should go to the medical officer. The patient's doctor is invited to be at any examination. Dr. **Broughton**: Is the aware that some medical practitioners would like to to refer some of their own patients to regional medical for a second opinion on diagnosis and treatment, and discuss this matter with the Minister of Health with to making simple arrangements whereby general n practitioners may refer cases in that way?

Mr. **Griffiths**: Some of the general practitioners d cases to the regional medical officer, and that is a p which we seek to encourage on every possible occasion

Unstaffed Hospital Beds in Scotland

Mr. **William Gallacher** asked the Secretary of for Scotland what was the number of unstaffed hospita in Scotland at the latest available date.—Mr. A **Woodburn**: At Sept. 30, 1949, the number was esti at 6500.

Supply of Contraceptives to Soldiers

Mr. **Emrys Hughes** asked the Secretary of State fo what were the regulations dealing with the supply of c ceptives to soldiers.—Mr. **Emanuel Shinwell** re In overseas commands, condoms are made available free issue, to individuals who ask for them, with a v the prevention of venereal disease. In the United Kin where the risk of contracting venereal disease is consid less, no contraceptives are issued.

Anti-leprosy Measures in West Africa

In answer to a question Mr. A. **Creech Jones**, sec of State for the Colonies, stated that in Nigeria ther a fully organised leprosy service and arrangements were made to extend its activities from the areas in the sou the whole territory. Missionary bodies, already exten engaged in leprosy work, were being brought fully int programme. An experienced leprosy research office recently been appointed to the government service. A prehensive scheme for the future had been drafted an now under consideration.

Birth-control Advice in Nigerian Hospitals

Mr. N. R. **Sorensen** asked the Minister if consid had been given to the question of allowing birth c advice to be given at appropriate hospitals and clin Nigeria similar to the circumstances where this advic given through public medical authorities in this count Mr. **Creech Jones** replied: So far as I am aware, no.

Obituary

THOMAS PORTER McMURRAY

C.B.E., M.CH. R.U.I., F.R.C.S.E.

fessor McMurray, who retired last year from the of orthopædic surgery in the University of Liver- died from a heart attack in London on Nov. 16. as on his way to South Africa where he was to is son.

n in Belfast, the son of Samuel McMurray, he educated there at the Royal Academy and the 's University, where he graduated M.B. in 1910. h he thus lacked Liverpudlian birth and breeding, nt to Liverpool the year after he qualified, to work Robert Jones, and thereafter he carried on onservative tradition of the Liverpool school of pædics with almost native tenacity.

[Bacon & Sons

1911 he took up his appointment as house-surgeon e Royal Southern Hospital, where he afterwards became surgical tutor and registrar and later full surgeon. He was closely associated with Robert Jones in his work for children, and he joined the staffs of the Royal Liverpool Children's Hospital and the Alder Hey Children's Hospital, as well as the David Lewis Northern Hospital. He was also consultant orthopædic surgeon to the Lancashire County Council. During the 1914–18 war he was surgeon to the Military Orthopædic Hospital at Alder Hey and acted as inspector of orthopædic hospitals in Ireland. In 1919 he proceeded to his M.CH. degree and in 1926 he took his F.R.C.S.E.

McMurray as a surgeon a colleague writes: "He a superb artist. Rapid and precise, he often used y 'Don't mess about; go in, do what you want , and get out again.' As he got older he operated and less, and he made a point of saying that the for operating grew less as the surgeon grew older. ed, he was essentially conservative: he made no r change in method or practice, and in the last ty years he never used screws or nails or plates. examination of patients, whether in hospital or ulting-room, was brief and to the point. He wasted ime, gave his opinion confidently and succinctly, cheered the patient with some short, snappy sentence 'Go home and use it.' 'We will fix it for you,' You're a credit to us.' He could be as brusque and utspoken as Hugh Owen Thomas, as charming and as Robert Jones. At heart he was sensitive, disliking ence and pomposity, full of contempt for fashions eatment. He had a imp of mischief which popped from time to time, and he enjoyed good-natured er."

r many years before his appointment to the chair 940 McMurray had been lecturer at the university, many surgeons, in the Dominions as well as in ll remember his teaching with gratitude ; for, like Robert Jones, he had the wing young men to him and moulding . He trained scores of orthopædic surgeons, shep- ded them afterwards, and secured posts for many. "boys" are scattered all over the globe, and they rned to him whenever they came back to England. his disciples he gave the things that cannot be learnt m books or even from personal experience. He ested formality and scorned academic teaching. The dent was the apprentice whose natural place was h the patients in clinics and in wards. One of them alls his friendly warnings: "You have read that in ook" he would say reprovingly. "Seal it laddie"; d "Don't touch it laddie" were other characteristic ngs which have become traditional. He never ght to impress students but only to enlighten them. re than anything he delighted in leading them up the garden path, for he knew that then they would never forget the point at issue. Probably the deepest and most moving joy of his professional career came when his old students, at the dinner they gave in his honour, told him how much they owed to him over the quarter century which ended with his retirement from his chair last year.

During the late war, besides doing invaluable work for the Emergency Medical Service as orthopædic consultant in the North, he undertook the organisation of special courses of instruction in traumatic surgery. His gift of leadership and his constant anxiety to help the younger men was also apparent when, early in the war, he became president of the British Orthopædic Association. A fellow member writes: "Many, I think, must have been as impressed as I was by the masterly way in which he summed up a discussion, so that the younger members of the audience should receive a maximum of sound and useful information." Very many will miss Professor McMurray at next year's Liverpool meeting of the British Medical Association, of which he was president elect.

R. W.-J. writes: "The suddenness with which the alert vitality and boyish good humour of T. P. McMurray has been lost is still difficult to believe. Only in recent months he was still teaching postgraduate students from Australia, Canada, South Africa, and many other parts of the world. His teaching was forceful and dogmatic: and in so far as Liverpool traditions were concerned almost intolerant. Only last week, when the Hugh Owen Thomas lecture was delivered in Liverpool, he welcomed back to the fold 'a lost sheep,' who reaffirmed principles taught by the founder of British orthopædic surgery. But the memory that is preserved by former students is that of a quick-witted, good-humoured kindliness warmed by an emotion amounting almost to sentimentality which McMurray himself would never have admitted. Young surgeons throughout the world will long remember his clinical skill and astonishing dexterity, his stimulating teaching, and above all his capacity for kindness and deep affection."

Outside Liverpool McMurray also inspired respect and affection, and N. C. adds: "His influence has been profound, and not least upon those who, like myself, were critical of some of the minor details of practice which he maintained. It was, however, upon fundamental ideas that he succeeded, and he never ceased to teach the dominant doctrine of Thomas and the first principle of orthopædics, physiological rest. In emphasising conservatism, he nevertheless contributed to the advancement of surgical practice. *Characteristically he took* to himself little credit for the operations that go by his name. He preferred to acknowledge Lorenz as the originator of the osteotomy, which, as used by McMurray, is probably the best method of treatment for the un-united femoral neck fracture. The other variant for osteoarthritis of the hip was of particular value in correcting the element of deformity, but McMurray did not believe that it provided the ideal solution. His teaching was direct and practical. His own literary work was not voluminous, but he often contributed to scientific discussions and always with something worth hearing. His writings on the surgery of the hip and knee joints, on the problems of slowly uniting fractures, and on rehabilitation *are characteristic. He wrote one of the best little* textbooks on orthopædic surgery. McMurray was an apostle of orthodoxy based upon recognition of the importance to orthopædics of the biological processes of growth and repair."

For his retirement McMurray had bought Ystrad Cottage at Denbigh, where he enjoyed welcoming his friends. "He carefully spelt the word Ystrad for you, and when you arrived, before you were allowed in the house, he would say 'Come and see the garden.' He would formally introduce you to the roses, and if it was the fruit season he would be concerned lest you had not brought a large enough basket to be filled with apples."

Professor McMurray's first wife, formerly Miss Dorothy Hill, died in 1936. In 1944 he married Miss Winefred Evershed, who survives him. He also leaves by his first marriage a daughter and a son who is practising orthopædics in South Africa.

Notes and News

MODIFIED RAPTURE

Mass Observation have surveyed the National Health Service in an engaging book.[1] "Do we really like it now we've got it?" is the theme; and doctors, before they open their lips to reply, should note that the answer was sought from patients as well. The doctors get their say, though, in a chapter contrasting the points of view of Dr. D and Dr. Y. "Dr. D is tall, thin, has a slight stoop and wears spectacles; he dresses carefully but conservatively in a dark suit and tie and an Anthony Eden hat." His partner, Dr. Y, is sturdy and slightly rotund. "He wears expensive well-cut suits and looks successful." Both doctors find flaws in the service, but their attitude to flaws is different. Readers will enjoy equating themselves with one if not the other. Then there is a very good chapter on a doctor's day, through which Mass Observation's investigator accompanied Dr. D, even though it entailed 14 hours of active service and a night call to top it off.

Patients too will find themselves in these pages—commenting on the service, summing up the doctors, pronouncing upon health. Their praise for what is good in the N.H.S. might be described as British praise, tempered with caustic. "Most people can find something they don't like about the new scheme," the report says; "but most of them approve it as a whole. And in the last resort, when all the vexations and all the irritations have been aired, this woman's comment remains unanswerable: 'I like it that you haven't got to pay.'" She was one of those who used to hesitate to call the doctor to her children because she had not always the money ready to pay him.

As for Ronald Searle's wildly droll drawings—the Naldrett Press should make us all their debtors by publishing them as Christmas cards for doctors. But why does no artist ever look to see what a stethoscope is like?

BRITISH MEDICAL STUDENTS' ASSOCIATION

The 8th annual meeting of this association was held in Edinburgh on Nov. 11–13. Among the subjects discussed was student health—a field in which the resources have been improved during the past year. The association has undertaken, together with the National Union of Students and other interested bodies, to investigate the possibility of arranging special facilities for tuberculous students whereby they may continue their studies as a form of occupational therapy under the supervision of a university and at the discretion of the physician in charge of the case. The work of the association on behalf of ex-Servicemen has been widely appreciated. Several anomalies in the administration of grants have been corrected, and the Ministry of Education has agreed to make a special concession in favour of medical students, and to continue some measure of financial support to the newly qualified ex-Service houseman who is supporting a family. The meeting appointed a grants secretary, who will be responsible not only for matters concerning ex-Service grants but also for advising students in receipt of other awards. It was noted that facilities for showing films are still inadequate at many schools. There is at present no adequate medical-film catalogue, and the association has set up a film-viewing panel to review medical films from the student's viewpoint. Very successful clinical conferences have been held at Cardiff, Manchester, Sheffield, and Glasgow; and it was decided to encourage the holding of conferences for preclinical students, thus stimulating the interest of students at all stages in the work of hospitals in other parts of the country.

P. L. C. Diggory, of University College Hospital, was elected president, and Jane Stanley Evans, of Cardiff, secretary, for 1949–50.

PUTTING THE PATIENT AT HIS EASE

Information leaflets for patients entering hospital are not easy to write. Some are fulsome yet convey little real concern for the patient's comfort. Some are cold and formal, looking to the patient like a string of discouraging rules. A leaflet from Tindal General Hospital, Aylesbury, neatly avoids these clashing rocks. It is plain, friendly, straightforward, and packed with useful facts.

"It is hoped," it begins sensibly, "that your stay in this hospital will be as comfortable as possible." The correct postal address of the hospital, its telephone numbers, the address of the hospital management committee, the names of the medical superintendent, the matron, and the trative officer follow. Then the patient is told the his ward, the sister in charge of it, the physician under whose care he will be (and he is told whether him Dr. or Mr.), and the house doctor who will day-to-day care. He is advised to ask the sister house doctor about medical or nursing problems, almoner about such things as certificates, transport, valescent homes. He is told what are visiting times, friends can get visiting cards, what to do about his clothing, and ration-book, when meals are served, and are the smoking and wireless hours. The times and plac religious services are given. The postal arrangement explained, the library service described, the visits of the dresser and chiropodist noted. He is invited to sha occupational therapy, to coöperate about teaching, and write and give nis comments when he gets home.

There is perhaps one small flaw in the admirable docum A letter, he is told, will in any case be sent to his doctor; if, at the time of discharge, he wants to know more about illness, he is "to approach the house doctor, who will d best to explain"; and if he wants further advice he sh ask the physician or surgeon under whose care he has b The morale of the patient seems here to be maintained at expense of that of the houseman—who, poor fellow evidently not got the hang of the case. Would it not b reassuring for all parties if the patient could be told th houseman would in any case explain his illness to him; that if he wanted further particulars the physician or su would always willingly answer questions?

RESCUE FROM DROWNING

A new type of life-saving gear for rescuing the drow consists of a long double-loop formed by a circular buoy cord divided in the centre with a sliding hitch forming divisions—one for the casualty, and the other for the resc The rescuer passes one loop over the shoulders to the che the casualty, presses the hitch close up, and then sw away with the other loop around his own chest an shoulders. In this way, it is claimed, the rescuer is left his arms and legs free. The equipment, designed by Cap Ernest Adams, is obtainable, under the name 'Life-L from Messrs. Siebe, Gorman & Co. Ltd., Neptune W Tolworth.

SUBSIDIA MEDICA

This new quarterly journal[1] of which the first issue app in September, is published under the direction of Aus specialists in pharmacology and related sciences. The aim is to provide information about new drugs, inclu their chemical structure, actions, and uses, side-effects, contra-indications, dosage, forms available, manufactu names, and official regulations concerned with their su and use in Austria. Reviews will be a prominent feat and mercurial diuretics are dealt with in this first num New apparatus and technical procedures are also descri The format is convenient and the typography excellent.

MEDICAL PROGRAMMES ON TELEVISION

In a television programme on Nov. 21, Dr. R. D. Lawr discussed the diagnosis and treatment of diabetes and P C. H. Best, F.R.S., was seen in a specially filmed interview. programme was one of a series designed to introduc layman to medical procedures. The first, on H Chemicals, was introduced by Sir Alexander Fle F.R.S.; and a programme on surgery is to be presented month.

These are not the first features of medical interest wh have been shown to Britain's growing television audi There have, for instance, been programmes on blo transfusion and mass radiography; these had rather obvi "propaganda" implications, and the response, particula to the latter, was considerable. Medical students and phy therapy students and staff took part in a production physiotherapy. The television microscope enables mi organisms to be televised direct, without the interventio film. Like other programmes, the Under the Micro series was not formally educative, but the field was cover a way which presupposed an intelligent audience; for programme the phase-contrast microscope was employ These programmes have been given in the evening—the p viewing period. Medical features of a more directly practi nature are included in the women's programmes in the on. Here there have been discussions and demon- as on feet, with particular reference to posture; on diet; on the treatment and prevention of burns and ; and on the care of a patient in bed. A number of films have been televised, such as those on mental which are being shown at present; and the work of the r and physiotherapist have been illustrated. It is hoped, ertain difficulties can be overcome, to include mother- emonstrations, and, as a further extension of the policy pagating positive-health ideals and helping to dispel include in the children's hour a feature on dentistry. , there has unfortunately not emerged a medical mality" on television comparable to the Radio Doctor, en neither was there a Radio Doctor in the Savoy Hill

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[1] Meet Yourself at the Doctor's. London: The Naldrett Press. 1949. Pp. 70. 3s. 6d.

[1] *Subsidia Medica*. Published quarterly by the Verlag Hollinck, Vienna 3, Steingasse 25. Pp. 52. 6 Austrian sh

television programme must, of course, be not only but "entertaining." There are difficulties as well as unities in the medium, and it is encouraging that the rs at Alexandra Palace have not hesitated to show ative programmes, such as that on diabetes. The television authorities are always pleased to receive tions from doctors.

"HIS FIGHTING CHANCE"

s is a ten-minute sound film made for the Ministry of by the Crown Film Unit, and obtainable in 16 and from the Central Film Library. Largely made up of ial from last year's *Polio Diagnosis and Management*, lm is designed for showing in public cinemas; and oosevelt has recorded part of the commentary. Dealing with hospital care and reablement, it shows a baby young man at the beginning of their illness and at s later stages. It might usefully have explained some- of what happens to nerves and muscles in this illness; is nevertheless well made and conveys the importance ping up the patient's morale.

HOW TO EAT AND DRINK

o and wine are appropriately discussed at Christmas. ook[1] on these absorbing topics, Nell Heaton and André offer sound information, pleasant reading, and elegant tation, and awake a bitter-sweet nostalgia. André we know as the doyen of the wine trade in London, ent of the Food and Wine Society, and author of many s on wine, its production and uses. In this volume ites a concise and authoritative series of essays on wines spirituous liquors, setting out all that a hostess or sseur needs to know. Nell Heaton has captured the t in the high-class Mrs. Beeton-in-the-original type of and, as usual, manages to arouse an interest that rises e and beyond rationed foods. In addition she shows ty taste in quotation and introduces each month with ginal, brief, rhythmic piece of prose.

JEWELLERY AS A HANDICRAFT

CCUPATIONAL therapy so often ends up with an object h nobody wants—a rug which is (unintentionally) a little , a set of table-mats in unwelcome colours, a lot of g belts, or a set of paintings remarkable rather for their peutic effect on the patient than their æsthetic charm for amily. There is much to be said for teaching him, instead, ake simple ornaments of inexpensive materials which his and daughters can praise, and even wear for a time, ut being committed to a long association. Last year Worshipful Company of Goldsmiths arranged a conference[2] ch simple jewellery-making was discussed as a diversion people and convalescents. Mr. Claude Geoffroy- ume, who received a grant from the company to enable to demonstrate the craft to occupational therapists, has published an attractively illustrated book,[3] listing the s and equipment needed and giving directions for the ing of various little ornaments. It is written for the her rather than the student, and no tyro could expect to t up jewellery-making from this book without the help of structor, anyhow in the initial stages; or, indeed, without per equipment, for though the tools are described as le they are quite numerous and not all the sort which found in the family tool-chest. The book shows a design for a bench to be used on a bed; and with this, and a visiting instructor to guide him, any neat-handed person, man or woman, should be able to decorate his family to some tune. If he can ally himself to the hospital dramatic society and provide the ornaments for their costume pieces so much the better.

University of Cambridge

The degrees of M.B., B.CHIR. have been conferred by proxy on E. K. Westlake.

Dr. J. R. Robinson has been appointed assistant director of research in experimental medicine, and Mr. C. L. Smith, PH.D., physicist with special reference to the applications of high-voltage apparatus to radiotherapeutics.

University of London

Dr. E. W. Walls has been appointed to the S. A. Courtauld chair of anatomy at the Middlesex Hospital. The title of reader in anatomy has been conferred on Dr. Ruth Bowden in respect of her post at the Royal Free Hospital.

The degree of D.SC. has been conferred on Prof. K. J. Franklin.

The governing body of the British Postgraduate Medical Federation have appointed Brigadier D. C. Bowie, F.R.C.S.E., regional adviser in postgraduate medical education for the North West Metropolitan hospital region from Feb. 1, 1950.

The following have been recognised as teachers of the university:

T. A. B. Harris, anæsthetics, W. S. McConnell, anæsthetics, E. H. Rink, anæsthetics, T. H. Hills, radiology, Ralph Kauntze, medicine, R. S. Lawrie, surgery, T. L. T. Lewis, obstetrics and gynæcology, R. C. MacKeith, children's diseases, J. W. Mansie, dental surgery, T. A. Munro, mental diseases, all at Guy's Hospital; F. S. Cooksey, physical medicine, King's College Hospital; G. J. Cunningham, pathology, St. Bartholomew's Hospital; H. F. Anderson, surgery, D. C. Shields, physical medicine, St. George's Hospital; H. J. Wallace, dermatology, W. D. Wylie, anæsthetics, St. Thomas's Hospital; Henry McIlwain, biochemistry, Institute of Psychiatry; J. A. Fraser Roberts, hygiene and public health (medical genetics), R. F. Tredre, hygiene and public health (tropical hygiene), London School of Hygiene.

Royal College of Physicians

Prof. W. H. Wynn will deliver the Fitzpatrick lectures on Tuesday and Thursday, Dec. 6 and 8, at 5 P.M., at the college, Pall Mall East, S.W.1. Continuing the survey of Pestilence of War which he began last year, he will deal with the 6th to the 15th century in his first lecture, and the 16th to 19th century in his second.

Royal College of Obstetricians and Gynæcologists

At a recent examination for the diploma in obstetrics the following were successful:

Maksymilian Allerhand, Janet W. Anderson, Jerzy Arendt, Margaret A. Barber, G. T. D. Barr, P. R. Birks, Grace F. M. Braid, E. R. Broadberry, F. B. Bromfield, A. M. Buchanan, J. S. Caldwell, I. C. Campbell, J. E. Carrick, Helen A. Cawson, A. R. Cini, Patrick Coffey, M. I. Cookson, Janette G. Cowie, Mary Creevey, Margery N. Cummins, E. C. Davies, Margaret S. Dawe, A. M. Dawson, Binapani Dei, Christabel M. Dickie, E. M. Edwards, R. L. Edwards, M. W. Eddings, S. E. Ellison, James Elstub, R. N. M. Eminson, S. C. Farman, Margaret M. Ferguson, M. B. Flangan, Ammud Freier, William Gavin, G. S. Hargrave, R. T. T. Harrison, R. D. C. Hart, Brenda M. Hilton, Catherine M. Hoyle, B. W. Hughes, E. N. Hugh-Jones, R. C. Humphreys, Barrymore Humphries, Mary H. Hutcheon, Manjula Khaserao Jadhav, John James, R. J. Jameson, Alexander Jamieson, R. D. Johnstone, Barbara Jones, Artin Karnik Kantarjian, Thomas Kelly, H. A. Kelsey, Colette D. G. Le Doux, M. P. Lewis, Alistair Macarthur, I. M. G. Mackay, E. A. McColl, A. C. McDougall, I. D. Mackichan, C. A. Martin, Kazimierz Antoni Makos, G. C. Mathers, Stanley Mercer, T. J. M. Monteith, A. C. Malvaney, Amnah Sabri Murad, D. R. Murley, A. G. Murray, E. M. O'Dwyer, J. P. O'Dwyer, Mary G. O'Hare, R. A. O'Shea, R. L. Osmont, Margaret G. Oyston, R. A. O'G. Pearson, Alexander Persey, M. J. Peto, Sonia A. Purdie, Irene Rajaratnam, G. F. E. Ramsden, G. H. Rees, G. T. Salter, R. S. Saxton, R. T. Sears, T. B. Sherry, Mary A. Shirreffs, Margaret L. Smith, Mary Smith, R. J. Sollars, J. W. Squire, W. J. Stedman, Anne M. Stewart, Elizabeth Stewart, N. G. G. Talbot, T. J. Thompson, Sheena M. Tosh, A. C. Turner, P. V. Wadsworth, Jeffrey Walsh, Abraham Wallach, N. H. Warburton, A. D. J. Watt, A. R. Webster, Elisabeth M. White, Margaret O. Will, L. J. Wood, A. J. Woolf, Ma Aye Yin.

Institute of Psychiatry

On Thursday, Dec. 1, Prof. W. E. Le Gros Clark, F.R.S., will lecture on the Visual System, and on Thursday, Dec. 8, on the So-called Rhinencephalon. Both lectures will take place at 4.30 P.M. at the Maudsley Hospital, Denmark Hill, London, S.E.5.

Bolton Royal Infirmary

On Thursday, Dec. 1, at 3.15 P.M., Dr. Harold Balme, medical officer in charge of rehabilitation at the Ministry of Health, will open the extensions to the department of physical medicine and rehabilitation at this hospital.

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[1] Calendar of Food and Wine. Illustrations by T. B. L. Huskinson. London: Faber & Faber. 1949. Pp. 268. 15s.

[2] Lancet, 1948, ii, 315.

[3] Simple Craft Jewellery. London: Faber & Faber. 1949. Under the auspices of the Worshipful Company of Goldsmiths of London. Pp. 63. 5s. 6d.

National Health Service Tribunal

The address of the clerk to this tribunal is now R. B. Cooke, Solicitor, 2, John Adam Street, Adelphi, London, W.C.2 (TEMple Bar 6055).

Research Board for the Correlation of Medical Science and Physical Education

The William Hyde Award (£300) for 1948, for work in connexion with physical medicine, has been given to Dr. J. M. Tanner, lecturer in physiology at St. Thomas's Hospital.

West of England and Wales Society of Dermatology

The inaugural meeting of this society was held at Bristol on Oct. 28 when Dr. Clifford Evans took the chair. It was decided to hold three clinical meetings each year—one will will be at Bristol in October, one in Wales in January, and one in Gloucester, Plymouth, or Exeter in April. Further information may be had from Dr. Robert Warin, the hon. secretary, 18, Mortimer Road, Clifton, Bristol, 8.

British Commonwealth and Empire Nurses War Memorial Fund

This fund was inaugurated by the *Nursing Mirror* in 1946 to furnish a memorial chapel in Westminster Abbey and to found postgraduate travelling scholarships for nurses and midwives. Over £70,000 has been subscribed already. When the appeal for the fund is complete permanent arrangements for administration of the scholarship fund will be made, but as several scholarships have been given outright the council has decided to make an interim award in 1950 of eight scholarships, each of £350. Further particulars may be had from the scholarships secretary of the fund, Dorset House, Stamford Street, London, S.E.1.

Registrars' Groups

At a meeting of registrars from six hospitals of the North East Metropolitan region, on Nov. 3, it was decided to form a registrars' group, and a provisional committee was elected. All registrars in this region are invited to attend a general meeting at Mile End Hospital, Bancroft Road, London, E.1, on Thursday, Dec. 8, at 8 P.M., when it is proposed to form a permanent committee.

In the Leeds region the committee of the newly formed group is made up of representatives from seven sub-regions. Further information may be had from the group's hon. secretary, Dr. P. R. R. Clarke, County Hospital, York.

Institute of Medical Laboratory Technology

At the annual meeting of this institute in Oxford on July 29, the following exemptions from institute examinations were approved.

Exemption from the final examination for associateship may be granted to those with a science degree (or associateship of the Royal Institute of Chemistry) in approved subjects, where the candidate has had not less than one year's experience in approved pathological laboratories. The above may qualify for fellowship by thesis after a further three years' experience.

Exemption from the intermediate examination may be granted to those having not less than 15 years' experience in approved pathological laboratories prior to July 29, 1949.

Copies of the institute's memorandum and articles of association may be obtained (price 1s. 2½d.) from the registered office, 76, Brewer Street, London, W.1.

London School of Hygiene and Tropical Medicine

Prof. Andrew Topping has been appointed whole-time dean of the school. He will take up his duties in the middle of February, 1950.

Dr. Topping, who is 58 years of age, graduated M.B. at the University of Aberdeen in 1914 and served with the R.A.M.C. in Gallipoli and Mesopotamia during the first world war. For some years he was senior medical o[illegible] and on his return to England he became r[illegible] Rochdale. After a period of service in t[illegible] service, he was deputy medical officer of [illegible]ity Council and lecturer in public health at Charing Cross Hospital medical school. After the second world war he became deputy chief of the relief services of UNRRA and later director of health of the European division. Dr. Topping is at present professor of social and preventive medicine in Manchester University. In 1944 he published, with Sir Archibald Gray, for the Ministry of Health, a *Survey of the Hospital Services in London and the South-East Counties.* He was elected F.R.C.P. in 1946.

The Royal Society of Medicine is to publish a full account of the symposium on psychosurgery by United States speakers, which was held by the psychiatry section of the society on Sept. 12 and 13, and was reported briefly in these columns (Sept. 24, p. 562). Application for copies, price 7s. 6d. each, should be made to the society's hon. editors, 1, Wimpole Street, London, W.1.

Diary of the Week

NOV. 27 TO DEC. 3

Monday, 28th

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. S. L. Simpson, Dr. E. B. Strauss: Impotence.

Tuesday, 29th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. C. H. Andrewes, F.R.S.: Virus Theory of in the Light of Recent Work. (Imperial Cancer Re Fund lecture.)

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. W. N. Goldsmith: Lupus Erythematosus.

Thursday, 1st

ROYAL COLLEGE OF SURGEONS
5 P.M. (With the Institute of Laryngology and Otology.) Geoffrey Jefferson, F.R.S.: Intracranial Absces

UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene, Keppel Street, W.C Dr. J. H. Sheldon: Problems of Old Age.

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. L. Forman: Ulceration of the Mouth.

INSTITUTE OF PSYCHIATRY
4.30 P.M. (Maudsley Hospital, S.E.5.) Prof. W. E. le Clark, F.R.S.: The Visual System.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Anthony Feiling: Neurology lecture-demons

ROYAL PHOTOGRAPHIC SOCIETY, 16, Princes Gate, S.W.7
7 P.M. *Medical Group.* Mr. Hedley Atkins, Prof. Pickering: Criticism of Lantern Slides from a Point of View.

HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edin Dr. D. M. F. Batty: Cirrhosis of the Liver.

Friday, 2nd

UNIVERSITY OF LONDON
4.30 P.M. (King's College Hospital Medical School, S.E.5.) Geoffrey Keynes: Surgery of the Thyroid. (Legg lec

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.9
5 P.M. Dr. Helen Dimsdale: Clinical demonstration.

Saturday, 3rd

YORK MEDICAL SOCIETY, 17, Stonegate
8.30 P.M. Prof. Martin Rushton: Deformities of the Jaw.

Appointments

TEMPLE, L. J., M.B. Lond., F.R.C.S.: consultant thoracic sur Stoke-on-Trent group of hospitals, for duty at the Che Joint Sanatorium.

THOMAS, G. H., M.B. Lpool, D.M.R.D.: consultant radiologist, W group of hospitals.

London County Council Public Health Department

Assistant medical officers:
FLEMING, MARY, M.B. Belf.
FOLEY, CATHERINE, M.B. N.U.I.
FOXE, ANTHONY, M.B., D.P.H.
MATHERS, RUTH, M.B. Lond.
PAUL, JACK, M.B., D.C.H.
SHERRIFF, G. G., M.B. Edin., D.P.H.
SIMPSON, ESTHER, M.D. Lond., M.R.C.P., D.C.H.

Births, Marriages, and Deaths

BIRTHS

BAIRD.—On Nov. 10, at Guildford, the wife of Dr. J. T. Ba a son.

DONALD.—On Nov. 16, at Inverness, the wife of Dr. W. A. Donald—a daughter.

MARRIAGES

HARRISON—LAMB.—On Nov. 18, in Auckland, New Ze William Rhodes Harrison, M.R.C.S., to Elisabeth Allison

DEATHS

CLUTTON.—On Nov. 19, at Crowland, Frank Husband Cl M.R.C.S., aged 78.

HARDING.—On Nov. 13, Robert Dennis Harding, B.A., D.M. M.R.C.P., D.T.M. & H.

McMURRAY.—On Nov. 16, in London, Thomas Porter McMur C.B.E., M.B., M.CH. R.U.I., F.R.C.S.E., aged 61.

THOMSON.—On Nov. 16, Andrew George Anderson Thom M.A., M.B. Aberd.

Prof. Crighton Bramwell is returning on Dec. 8 from three-week tour in Italy where he is lecturing on behalf the British Council.

Mr. C. Price Thomas and Dr. Robert Machray have left Portugal where they are to give a series of lectures on beh of the British Council.

Dr. Darma Setiawan, former minister of health in republican government of Indonesia and now personal advi to the republican premier of Indonesia, is visiting this coun at the invitation of the British Council to study public hea and hygiene in Britain and in particular the National Heal Service.

"PLEURAL SHOCK"

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E first clinical description of "pleural shock" was : by Roger in 1864. While he was washing out a lic empyema cavity with an antiseptic, the patient, ild of 8 years, fell back unconscious, with clonic actions of arms and legs, but recovered after an . He called the condition pleural epilepsy because s leading symptoms, and attributed it to reflex n from stimulation of nerve-fibres in the pleura.

nilar cases were described later. In some there were r paralyses sometimes amounting to hemiplegia. mon symptoms were dilatation of one or both pupils, eration and weakness of the pulse, and visual rbances producing in some cases blindness lasting ral days. Most of the patients recovered, some ring temporary paralysis or weakness of the groups uscles which had been most affected by the spasmodic ractions. Some died, but no cause of death was d at necropsy.

ie reflex theory of pleural epilepsy received a rude k in 1912 when Brandes reported a case in which he injected bismuth paste through a sinus to outline pleural cavity. The patient died twenty hours later, at the necropsy bismuth paste was found in the bral vessels and elsewhere in the circulation.

INCIDENCE

s might be expected, the advent of artificial pneumo-ax increased the number of pleural accidents. lanini (1894) originally introduced air through a lle without manometric control; on reviewing his erience (Forlanini 1912) he stated that cerebral air olism belonged to the early historical period of umothorax treatment and could be avoided with ainty by modern technique; nevertheless he orted 12 examples (none of them fatal) of "pleural mpsia" in 134 patients. His most striking case-ord is that of a girl, aged 22, with a shallow icult left artificial pneumothorax, in whom "eclamp-" occurred on three successive refills; on the first asion she had a left brachial monoplegia with of consciousness; on the second she had similar ptoms with added spastic contraction of the left and on the third she had a left-sided hemiplegia hout loss of consciousness. Air embolism was clearly cause of this and other accidents described by lanini. Saugmann (1911), who used a manometer, ing had 2 fatalities from embolism in 269 patients, lanini attributed the relative frequency of his own idents to the more volatile nature of the Latin races pared with the Scandinavian.

he danger of air embolism caused Murphy (1898) to icise the puncture method of inducing an artificial umothorax and to prefer open incision of the parietal ura.

EXPERIMENTAL

Attempts to produce experimentally the phenomena "pleural shock" have given variable results. Capps d Lewis (1907) applied stimulants to the pleura with tle effect, except in animals in which pleurisy had been eviously induced. In these animals two types of reflex, rdio-inhibitory and vasomotor, were described; these ere exaggerated in the upright position, as is the rotid reflex.

Cordier (1910) injected iodine into the pleural cavity ithout manometric control and produced "pleural hock"; this effect did not follow when the vagi had een cut. Croizier (1927) repeated Cordier's experiments, but with manometric control, and found that "shock" came on only when iodine was injected directly into the lung, and that section of the vagi made no difference. On the other hand, Wever (1914) reproduced the typical picture of "pleural epilepsy" or "shock" by injecting air or gas into the carotid arteries of rabbits and monkeys. He also showed that, even with experimentally induced air embolism, changes in the brain cannot always be detected without special methods of staining.

CAUSATION

As the result of clinical experience and experimental findings embolism came to be looked on as much more common than reflex shock as a cause of accidents following paracentesis, and it has long been generally accepted that embolism is much the most likely cause of many different symptoms, the nature of which depends on the site of the embolism. These symptoms include visual disturbances either from air in the retinal vessels or in those of the occipital cortex, jacksonian contractions followed by weakness of the muscles most affected, and unconsciousness followed by headache on recovery. The skin in various parts of the body may show evidence of vascular disturbance in the form of patchy cyanotic mottling described as marbling.

Though embolism is the most satisfactory explanation of the great majority of pleural accidents, a small group remains in which the patient becomes suddenly unconscious and pulseless, respiratory failure and death following rapidly. Some workers looked on these cases as true examples of pleural shock, but evidence soon accumulated showing that not only cerebral but also coronary air embolism may follow paracentesis. Among the more interesting papers on this subject are those of Van Allen et al. (1929), who injected air into the pulmonary veins of dogs and found that, with the head lowered, coronary embolism invariably occurred, whereas, with the head raised, cerebral embolism was the rule; in the horizontal position either might occur.

Kent and Blades (1942) performed similar experiments and showed that death occurred from ventricular fibrillation, and that cardiac arrest preceded respiratory arrest. Cameron (1945) described a case in which the attempted induction of artificial pneumothorax produced sudden unconsciousness, cyanosis, tachycardia, and sweating; there was no evidence of cerebral air embolism, and the case would probably have been put down to "pleural shock" had the electrocardiogram not shown the presence of heart-block followed by evidence of coronary occlusion doubtless due to bubbles of air in the coronary vessels.

From the foregoing evidence it is clear that air embolism is the most likely explanation of the rare serious or fatal accident during pleural puncture. Sudden death, without sign or symptom of cerebral embolism, does not necessarily mean shock, since we now know that, with a patient in the horizontal position, air may occlude the coronary vessels. The passage of air through the chest wall is not essential for the production of air embolism, for it has been known to occur during the aspiration of fluid.

The only two cases of air embolism I have encountered were similar in type, both occurring during attempts to find a shallow pleural space. No satisfactory manometer reading was obtained, and no air was given, but the patients were breathing deeply, thus producing a low intrathoracic pressure. Both patients experienced "muzziness" in the head, associated with involuntary movements of one hand (the lower one). The symptoms passed off in a few minutes, leaving a headache which lasted a few hours.

Puncture of a healthy area of lung is unlikely to cause air embolism. I have even known a patient have weekly refills of 1000 ml. from an enthusiastic but inexperienced practitioner for a year with typical intrapulmonary pressure readings and no radiological evidence of air in the pleural cavity, and no ill effects resulted. This favourable experience was possibly due to the fact that the lung was perfectly healthy, the hæmoptysis for which the pneumothorax was attempted being due to a dry bronchiectasis on the other side. When lung tissue is indurated by chronic inflammation, the veins are held open and cannot contract when mechanically injured; in such circumstances a needle may well make a communication between airway and vein, and deep respiration may suck sufficient air into the vessel to cause embolism.

Needless to say, all cases of syncope during paracentesis are not due to air embolism; there are people, sometimes healthy young soldiers, who lose consciousness when they are given a hypodermic inoculation. In the near moribund, too, syncope, sometimes fatal, may follow various minor interventions, including pleural puncture. There are also rare cases, designated as status lymphaticus, in which some trivial operation causes death. None of these groups can properly be described as pleural shock.

Textbooks of medicine agree in advocating proper anæsthetisation of the pleura for the prevention of "pleural shock." Common humanity is also stated to dictate this procedure before a refill. Now I rarely use a local anæsthetic once an artificial pneumothorax has been properly established, since I find that the great majority of patients feel less pain when a fine sharp needle is inserted quickly than they do with the several prods necessary to anæsthetise skin, chest wall, and pleura.

The pleura is violently stimulated without local anæsthesia in the treatment of recurrent spontaneous pneumothorax by the method extensively used by Brock (1948), in which 0·5 ml. of a 10% solution of silver nitrate is injected into the pleural cavity, this procedure being followed immediately by aspiration of as much air as possible. So severe is the chemical stimulation of the pleura that it is usual to give a hypodermic injection of morphine shortly before the silver nitrate; even with this precaution some patients experience cramping pain, which may be so severe as to inhibit respiration for a moment. "Pleural shock" does not occur with this method, though the stimulation of the pleura must be many times greater than that produced by puncture.

CASE-RECORDS

Serious accidents in paracentesis are fortunately rare, and I have only been able to collect 5 cases during the past twenty-five years, an incidence of about 1 in 10,000 punctures of the pleura.

Case 1.—A man, aged 26, attended as an outpatient for aspiration of thick greenish fluid complicating his artificial pneumothorax and for a refill with air. Two needles were used, the upper connected with the pneumothorax apparatus so that pressure was kept constant. The fluid was aspirated with a 20 ml. syringe. The patient sat on a couch; at the end of the aspiration the needle was removed, and the patient leant back so that a few more syringefuls of fluid could be removed. He suddenly became faint and then immediately lost consciousness, with his pupils dilated, his pulse impalpable, and appeared to be dead. A syringe was filled with adrenaline with a view to injection into his heart, but the patient suddenly revived and was even the least shocked person present.

This case was looked on at the time as one of pleural shock. Coronary embolism might have given similar symptoms but was unlikely because (1) the lung was so far collapsed that it did not appear possible for the needle to have reached it, and (2) the patient being in a sitting position, any air entering the circulation would have been more likely to produce symptoms of cerebral embolism. It is noteworthy that the pleural walls were rigid from chronic inflammation, and the aspiration of a little fluid after removal of the air needle may have caused an unduly low negative pressure.

Case 2.—A woman, aged 25, had had a left pneumothorax induced in 1932 and abandoned in because of fluid. In May, 1938, the fluid was found creamy green pus containing tubercle bacilli but no organisms. Pleural irrigation with physiological saline was started, the first two irrigations being given in and the rest at the artificial pneumothorax clinic. pressures were kept low—e.g., −8, −9. The first six passed off without incident, but on the seventh, towards end of the operation, the patient fell back unconscious widely dilated pupils. A few more breaths were taken, neither pulse nor heart sounds were detected. Attempts start the heart, including cardiac massage, were unavailing.

Necropsy Findings.—At necropsy eighteen hours later heart showed moderate enlargement from dilatation of cavities and hypertrophy of the right ventricle. The right was normal, but the left lung was completely collapsed had enormously thickened pleura; 3 oz. of saline solution found in the pleural cavity. Measurements showed that aspirating needle was not long enough to have reached visceral pleura. The coronary and cerebral vessels showed evidence of embolism. The verdict was pleural shock.

Case 3.—A woman, aged 24, three months pregnant, acute lobar pneumonia in the left lower lobe. This responded to sulphapyridine, but an empyema had dev by the eighth day. For the purpose of diagnosis I asp the chest and withdrew 10 ml. of thin purulent fluid, contained numerous pus cells but no organisms. At th peutic aspiration five days later, with the pleura anæsthe the aspirating needle was inserted without difficulty the patient sitting up in bed. After only 10 ml. of fluid been aspirated, the patient fell back unconscious; in a m of seconds her breathing stopped, her pulse could not be and her pupils were widely dilated and did not react to li Her teeth were clenched; otherwise she appeared dead. recovered in two or three minutes.

An interesting feature of this case is that preci similar symptoms developed some six months l immediately after parturition (Dr. C. B. Thom personal communication).

Case 4.—A man, aged 38, had been admitted to Unive College Hospital with three weeks' history of pain in the lower chest (made worse by coughing and breathing), bre lessness on exertion, fever, and sweating on exertion. Th were physical and radiological signs of a right pleural effus The white-cell count was 13,600 per c.mm. (polymorphs 85 The pleural fluid was turbid, containing scanty cells (p morphs 47%, lymphocytes 29%) but no organisms. Cult proved sterile; 13 oz. of fluid was removed. Two days l 30 oz. of greenish-yellow turbid fluid was aspirated witho refill with air. The patient sat up in bed during the treatm Two days later 40 oz. of similar fluid was aspirated, and patient suddenly felt ill, appeared shocked during aspira and had a pulse typical of fibrillation. Some air was the allowed into the pleural cavity together with penicillin 500 units. Next day the pulse was still irregular, and elec cardiography confirmed that auricular fibrillation was pre This condition persisted for about twenty-four hours, which the pulse and the electrocardiogram became no Aspirations were continued without incident for three more, by which time the fluid had become thick and drainage was done.

Case 5.—A man, aged 52, had had a left pneumonectomy R. S. Pilcher) for oat-celled carcinoma; the tumour prob invaded the pericardium. Three days later 26 oz. of blo stained fluid was aspirated from the pleural cavity. Towa the end of this procedure the patient became shocked cyanosed and was found to have auricular fibrillation. Th rhythm became normal after two days and was unaffect by the further aspirations. The patient was discharged fa well but died from cerebral metastases eleven months aft operation.

DISCUSSION

The present series of 5 cases is obviously too small have any statistical significance apart from illustrat the rarity of such accidents. All the cases, however, sh following points: (1) the accidents took place during th aspiration of fluid, a procedure invariably preceded local anæsthesia; and (2) some degree of infection, or in case 5 irritation of the pleura, was present.

lysis of these cæsarean sections shows an important ion :

f incision	No. of cases	Maternal deaths	Infant deaths
d	8	2 (25%)	2 (25%)
segment	60	14 (23%)	31 (52%)
segment	76	7 (9·2%)	22 (29%)

e the introduction of sulphonamides in 1931 there been 61 lower-segment cæsarean sections after orceps in my hospital with 6 deaths (10%). In ten years, when blood-transfusion has been freely le, there have been 33 with 1 death. Penicillin n available for only three years so it is impossible r its effect, but I think we can say that nowadays uld expect a mortality of about 5%. No doubt herapy and antibiotics will reduce the mortality ryotomy after failed forceps, but I would not a reduction to much below 10%. for the deaths out equally shared between sepsis and trauma. otomy in these cases never has been, and never e, so safe as lower-segment cæsarean section. head is above the pelvic brim even though the s dead, cæsarean section is less damaging to the r, less liable to introduce infection, and more ing of hitherto hidden injuries to the uterus. etal mortality is appalling, but it is the antecedent f forceps, and not the operation, that kills the

incidence of failed forceps is dwindling every year h I think it will receive a fillip from the National a Service Act). Less and less experience in these will be acquired by any one operator ; so I wish to sise that nowadays the safest way is by cæsarean n, though I would not have it thought that I am ating cæsarean section for all failed forceps cases. ean section should be used in those patients with cted labour who would need it if there was no ion of infection. Among 307 cases of failed forceps d 57 cæsarean sections—about 1 in 5.

SUSPECT CASES

se here my own record of operations for I have careful private notes of all my cases. I have acted my last 500 cæsarean sections as they ide with the sulphonamide era ; but my record is d date, for there are six and a half years missing in bstetric life. Much better results would be achieved days. Of the 500 cæsarean sections 260 were gh the upper segment and 240 through the . Until about 1937 the lower-segment operation voided unless the woman was in labour, and many y cases were repeat operations on women who had dy had an upper-segment incision. 401 operations on clean cases, with 5 deaths ; 74 were on suspect , with 3 deaths ; and 25 were on failed forceps , with 3 deaths. The suspect cases are listed in e I. I have excluded all the women who were less twenty-four hours in labour with membranes ured, unless they had had outside operative interce such as vaginal plugging, or had other evidences fection.

here were 74 operations with 3 maternal deaths—). Exactly 50 of these operations were through the er segment with 2 deaths, both of which occurred he first 10. In 1921 the maternal mortality in this up was 9·4%. Infant deaths numbered 11 (15%)— gh figure, but a study of the table will show that ne of them were unavoidable.

Table I contains no reference to the number of times se patients had been examined vaginally before ration. The reason is that this number conveys thing. A single vaginal examination may convey ngerous organisms to the uterus. To set a certain mber of vaginal examinations as the limit after which u will not do cæsarean section seems to me folly.

TABLE II—SUMMARY OF 500 CASES OF CÆSAREAN SECTION

Type of case	Upper-segment section							Lower-segment section						
	Mother			Child				Mother			Child			
	Total	Lived	Died	Lived	Congenital malformation	Stillborn	Died	Total	Lived	Died	Lived	Congenital malformation	Stillborn	Died
Clean	232	229	4	196	6	11	19	169	168	1	158	5	2	4
Suspect	24	23	1	21	0	3	0	50	48	2	42	1	1	6
Failed forceps	4	4	0	2	0	2	0	21	18	3	14	1	5	1

Since we usually have no knowledge of the technique used in the examinations we should look on every woman who has been examined once as potentially septic, and the woman who has been examined ten times is still only potentially septic, though we should not on that account refuse her cæsarean section. An operator's cæsarean-section statistics will benefit from his refusal to operate on suspect cases, but his patients will suffer for it. A summary of the 500 cases is given in table II.

Penicillin and blood-transfusion will improve the results still further. I have concentrated on the results to the mother. My infant mortality is high. Many of the upper-segment operations were done for placenta prævia, and the mortality is made higher by the fact that there were 13 congenitally malformed babies in the 500. Fifteen years ago enteritis was a serious problem, whereas now it is hardly ever a significant cause of infant deaths.

TECHNIQUE IN INFECTED CASES

In all these infected and potentially infected cases we can discard the old operations of eventration of the uterus, and of fundal and upper-segment incisions. The evidence is overwhelming that the lower segment operation is safer. In many of our earlier cases a vertical lower-segment incision was used, and a drain was put down to the site of incision. Both of these have been discarded, and we now rely on transperitoneal section through a curved lower-segment transverse incision, subsequently sewn in two layers with continuous catgut, the bladder being replaced with a continuous catgut stitch, and the abdominal incision closed without drainage. Before the visceral peritoneum is incised, the general abdominal cavity is packed off with soft wet gauzes. To pack dry gauze into the peritoneum is like packing dry gauze into an eye.

I have never understood the efforts that have been made to devise a technique for extraperitoneal cæsarean section. It seems to me that they are based on lack of appreciation of the pathology of peritonitis. Peritoneum is miraculous in its ability to deal with infection. We have only to consider ruptured digestive ulcers, and more particularly war-wounds of the abdomen with soiling of the peritoneal sac, to have this fact brought home to us. Once the source of infection is cut off the peritonitis resolves rapidly, because the peritoneum can now prevent that infection from travelling through it to the susceptible subperitoneal tissue, which is a loose open network full of blood-vessels and lymphatics but devoid of intrinsic defence against infection. Patients die of subperitonitis, not of peritonitis. If infective liquor amnii is to be spilt, rather let it be spilt in the peritoneal sac than dispersed in the subperitoneal layers. For this reason the separation of the bladder should

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The maternal mortality is 20·7%. How does
compare with cæsarean section after failed forc
Munro Kerr cited Evers's[4] series and said: "
in this group (23 cases) had a maternal death-ra
12·3% and a fœtal death-rate of 20 3%. I know of
few who have been able to present such low figur
this specific group."

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4. Evers, H. *J. Obstet. Gynæc.* 1934, 41, 842

TABLE

No. of pregnancy	Weeks pregnant	Hours of labour	Conditi
5th	40	30	Brow presentation; ru
1st	40	48	Age 39
7th	40	19	Placenta prævia; extern ring
3rd	40	7	Temp. 101°F, pulse rate
1st	40	27	Temp. 99°F, pulse rate
2nd	36	?	Placenta prævia; plugg
1st	40	31	Temp. 99 8°F, pulse r ovarian tumour
1st	40	45	Foul liquor
5th	40	22	
2nd	40	80	Plugged for placenta p
2nd	40	21	
1st	40	55	
1st	40	33	Foul liquor; previous
2nd	40	21	Temp. 99 6°F, pulse-ra
1st	40	36	Uterine fibroid; age 4
2nd	40	168	
1st	40	96	Acute gonorrhœa
1st	40	0	Stomach tube inductio
1st	37	21	
1st	10	48	Catheter induction
1st	42	136	Foul liquor, known d cæsarean section
6th	40	120	Brow presentation; B
1st	40	22	Catheter induction; liquor
1st	43	48	Age 36; breech pres
1st	40	120	Age 38; foul liquor
1st	42	120	Foul liquor
2nd	40	36	Prolapse of cord
1st	40	45	Prolapse thrombosed Bandl's ring
1st	40	17	Plugged twice
?	40	6	Bandl's ring
1st	40	36	Bandl's ring; temp. per min.
1st	40	16	Foul liquor
1st	40	72	Contraction ring
1st	40	72	Catheter induction
1st	40	24	Temp. 100 6°F, pulse
1st	38	Early	
2nd	40	48	Age 40; fibroid
1st	40	45	Vaginal manipulation
1st	40	24	Age 36; fibroid
1st	40	48	Brow presentation
1st	40	28	Vaginal manipulation
1st	40	10	
1st	40	31	
1st	40	45	
1st	40	48	
2nd	40	30	Foul liquor
1st	40	27	
1st	40	36	
1st	40	27	
1st	40	31	Age 16; foul liquor; rate 106 per min
1st	40	24	Prolapse of cord
1st	40	40	
1st	40	30	
3rd	40	12	Bandl's ring
1st	40	36	Brow presentation
1st	40	72	Gas gangrene infect ring
1st	40	120	Foul liquor
1st	40	60	Catheter induction;
2nd	40	24	
1st	40	28	Foul liquor, baby
3rd	42	48	Catheter induction section
2nd	40	72	
1st	49	30	Age 39; baby we
1st	43	168	Catheter induction section
2nd	40	20	Age 42; foul liquor
1st	40	96	
1st	40	55	Catheter induction;
1st	37	48	Catheter induction
1st	43	24	Bandl's ring
1st	45	24	
1st	40	72	
1st	40	26	
1st	40	44	
1st	40	60	

Maternal de

D, died · — ved; L.S, lower-segm

ttendant (case 3) were infected during the terminal of the illness, and at the necropsy, of case 5. was probably admitted to the hospital during the tion period of Q fever, and died of pneumonia after le illness lasting eleven days. The pathologists e post-mortem attendant may have been infected dling organs from case 5, or more probably by g droplets resulting from splashing or cutting such as the lung. It is of interest in this connexion post-mortem attendants are listed amongst the ses of Q fever described by Beck et al. (1949). ossible danger of infection at post-mortem exami- of patients dying of atypical or virus pneumonia be borne in mind.

estigation of case 5's household, in a coastal town th-east England, showed that his wife (case 6) lso infected; and efforts to find their source of on have revealed that cattle, farmers, and dairy- s in that district have serological evidence of on and that *R. burneti* is present in raw milk from of the farms in the area. The cows show no signs ess. The epidemiological relationship of cases 7 to the others (1–5) at the Royal Cancer Hospital is ot clear. Probably they were infected from some source, but this is still under investigation.

ISOLATION OF A RICKETTSIA

en possible, specimens of serum from the patients acute and convalescent phases were examined by mplement-fixation test, using the Henzerling strain *burneti*; detailed results are given in Harman's Isolation of the rickettsia was also attempted, whole blood or blood-clot from cases 1, 2, and 7. mens were taken on the eighth, ninth, and third the disease, respectively. Cases 1 and 7 were then ebrile, but case 2 had been afebrile for three days. lation into guineapigs of blood from cases 2 and not lead to the development of fever or antibodies, *burneti* was isolated from the blood of case 1. Isolation is described below.

od from case 1 which had been stored in an electric ator at −60°C for five days was thawed and bacterio- l cultures were made. The blood was sterile. The next 1 ml. of blood was inoculated intraperitoneally into eapigs (1 and 2) weighing 250–300 g. Temperatures taken morning and evening and remained within the al limits for our stock until the morning of the twenty- d day, when guineapig 1 had a temperature of 104°F. on this had risen to 106°F and the animal was killed ether. The spleen was deep red in colour, very soft and e, and twice natural size, although the animal had been st before inspection. No other abnormality was found. n, whole blood, and spleen were stored at −60°C after lation of bacteriological media. Guineapig 2 remained le, showed no rise in antibodies, and, when subsequently nged with the homologous strain, had an afebrile illness production of specific antibodies. The cultures of guinea- were sterile after forty-eight hours' incubation, and ml. of the blood was inoculated intraperitoneally into apigs 3 and 4, and 0·75 ml. of 10% spleen suspension ritoneally into guineapigs 5 and 6. Guineapigs 3 4 had a three-day febrile illness from the seventh to day and recovered. They were later shown to have oped complement-fixing antibodies for a known strain *burneti* (Henzerling). Guineapig 5 developed fever with mperature of 104·8°F on the sixth day and was killed. eapig 6 remained afebrile but produced complement- g antibodies. Similar results were obtained when spleen blood of guineapig 5 were inoculated into further eapigs.

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The relation of this strain, and others isolated from raw milk, to the American (Nine Mile) and the Italian (Henzerling) strains of *R. burneti* is being investigated.

SUMMARY

A strain of *Rickettsia burneti*, the causative agent of Q fever, has been isolated from 1 of a group of 7 serologically proven cases of Q fever associated with an outbreak at the Royal Cancer Hospital.

Epidemiological investigations have established the existence of an endemic focus of the disease in south-east England, and further investigations are being carried out to estimate the prevalence of the disease in man and animals in other parts of the country.

Attention is drawn to the need for care in removing serum from the blood-clot of cases of atypical pneumonia and in handling the organs of fatal cases of pneumonia.

Thanks are due to Miss B. Lewis, resident medical officer at the Royal Cancer Hospital, for much help in collecting specimens, and to Prof. R. A. Willis and Dr. J. W. Whittick and Dr. A. C. Christie, of the pathological department, for much information about cases. Dr. C. E. Etheridge, Dr. T. A. R. Callender, Dr. Thomas Glynn, and Mr. F. W. Whitehouse, sanitary inspector, gave much willing and appreciated coöperation in the epidemiological investigations of cases 5 and 6. We are particularly grateful to Dr. Herald R. Cox, of the Lederle Laboratories, U.S.A., for providing a supply of *R. burneti* antigen for the complement-fixation tests. We should also like to acknowledge with thanks the technical assistance of Mr. J. R. McDonald.

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"... It will be remembered that some portion of Battersea Park was devoted last year to rather problematic statuary of different kinds. I would suggest in order to provide a fitting emblem of that universal amity which the Government have been so successful in establishing, the right hon. Gentleman commission someone, preferably Mr. Henry Moore, to provide a statuary group of the Minister of Health embracing Lord Horder. That would have two advantages. It would attract all the innumerable friends and admirers of the Minister of Health, and it would attract all the innumerable friends and admirers of Lord Horder. If, moreover, the sculptor could recall to some extent the famous statue of Laocoon, and subtly suggest the idea of the Minister of Health struggling with a serpent—or conversely Lord Horder struggling with a serpent—the cup of public enjoyment would be filled to overflowing."—Mr. WILSON HARRIS in the debate on the second reading of the Festival of Britain Bill, *Hansard*, Nov. 23, column 423.

be not more than is necessary. Deliberately to open wide areas of subperitoneal tissue because the liquor amnii may contain infection is to put infection under a membrane which would much prefer to have that infection on its surface.

SUMMARY

Where it is indicated cæsarean section should not be refused because of the presence or suspected presence of infection. Other methods of delivery are more dangerous.

The mortality of cæsarean section in infected cases with penicillin, sulphonamides, and blood-transfusion is less than 5%.

The mortality of embryotomy after failed forceps has been 20%; though with penicillin, sulphonamides, and blood-transfusion it may be less.

Q FEVER IN GREAT BRITAIN

ISOLATION OF RICKETTSIA BURNETI FROM AN INDIGENOUS CASE

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Q FEVER was first described by Derrick (1937) in Queensland, Australia; and the ætiological agent, now known as *Rickettsia burneti*, was isolated by him and identified as a rickettsia by Burnet and Freeman (1937). At about the same time, a similar organism was isolated by Davis and Cox (1938) from wood ticks, *Dermacentor andersoni*, caught at Nine Mile Creek, Missoula, Montana, U.S.A.; it was named *R. diaporica* because it passed certain bacteria-retaining filters. The two rickettsiæ were later shown to be closely related if not identical. More recently, American workers have suggested that the properties of these organisms are sufficiently different from those of other rickettsiæ to warrant a separate generic name, and they are described as *Coxiella burneti*.

In recent years Q fever has been identified in Greece, Italy, Algiers, Morocco, Turkey, Iraq, Switzerland, France, Germany, and Panama, as well as in the U.S.A. and Australia. Investigations of the epidemiology of the disease in these countries show that the animal reservoirs of the disease and its mode of spread vary considerably according to local geographical and biological conditions. Nevertheless, a brief review of the findings in Australian, Italian, and Californian outbreaks will indicate some of the possibilities to be considered in investigating a case or an outbreak of Q fever.

PREVIOUS OUTBREAKS

In the seven years following the discovery of Q fever in Australia, Derrick and his colleagues found 176 cases of the disease (Derrick 1944). All the patients, with one exception, lived in the coastal area of south-east Queensland—129 of them in Brisbane and 47 in the surrounding countryside. Most of the Brisbane patients worked at the meat-packing plant where the original cases described by Derrick had occurred, and it was hoped that an analysis of their jobs in the meat works would indicate precisely the source of their infection. On the contrary, it was found that workers anywhere in the plant, including secretarial and mechanical staff, were liable to infection. This fact, together with the low infectivity of cattle tissues, was against infection by handling of, or splashing from, cattle organs. The occupational association with cattle was striking however; for in addition to the cases at the meat works, 37 of the 47 country patients lived or worked on dairy farms or in contact with stock. A serological survey of area showed that some were infected; and a natural reservoirs of the disease in bush their parasites—resulted in the isolation of R. from the bandicoot, *Isoodon torosus*, and its —the tick, *Hæmaphysalis humerosa*.

This suggested that the infection might be in nature by a tick-bandicoot-tick cycle, but it to explain the human infections, because *H.* reluctant to feed on man and is only an parasite of cattle. Moreover, a history of tick- very rarely obtained from cases of Q fever. (1944) suggested, however, that the infection of and abattoir workers might be due to the inhalati dust containing infectious, dried, tick excreta fro hides of the cattle. Though the ticks (*Hæmaph bispinosa* and *Boophilus annulatus microplus*) comm found on the cattle could be artificially infected, were not shown to be infected in nature.

The theory of infection of man by inhalation of dust—whether contaminated by tick excreta or secretions or in some other way—has received able epidemiological support from outbreaks of Q fever amongst Allied troops in where a relationship was found between dusty hay in bedding or dust in barns, &c., and outb of the disease (Robbins et al. 1946, Commission on A Respiratory Diseases 1946). This theory is reinforce the epidemiological association of Q fever with pack straw in a crate of American machinery received Swiss firm (Wegmann 1948), and the isolation of *R. bu* from the dust of sheep-pens in a north Califo outbreak (DeLay et al. 1949).

In Los Angeles county, south California, whe fever is endemic, intensive studies are being carried Beck et al. (1949) have analysed the epidemiology of cases of Q fever and concluded that infection was ciated almost entirely with either direct occupa exposure to cattle or residence close to dairy farm with drinking raw milk infected with *R. burneti.* north California, on the other hand, infection appea be due to occupational exposure to sheep and rather than to contact with cattle or consumptio infected raw milk.

Epidemiological data from these and various labor outbreaks indicate that the incubation period is 19 days, with a range of 14–26 days, and that case-to spread of the disease is rare. The hypothesis migh formed, then, that Q fever is primarily an infectio arthropods and animals which occasionally spread man owing to the inhalation of infected dust or consumption of infected milk and milk products. An reservoirs of the disease have varied in different coun and possibly in Great Britain the epidemiology will in some particular from the outbreaks already desc

Q fever has only recently been recognised in Britain. Stoker (1949) reported 2 cases diagnosed serological examination (complement fixation) in R personnel. Since late 1948, serological investigation 237 patients variously diagnosed as atypical or vi pneumonia, "influenza," or pyrexia of unknown orig has revealed 4 cases—the 2 mentioned above and the oth others, one in a radio mechanic in Bristol and the in an agricultural engineer at Banbury, Oxfordshire. should be mentioned that the series is rather selecti being composed mostly of patients living in or n London.

EPIDEMIOLOGY OF PRESENT OUTBREAK

The cases described in an accompanying paper b Harman have been the subject of an extensive epidem logical investigation, details of which will be publi later. At present it seems that the nurse (case 2), t two pathologists (cases 1 and 4) and the post-mortem ttendant (case 3) were infected during the terminal of the illness, and at the necropsy, of case 5. was probably admitted to the hospital during the tion period of Q fever, and died of pneumonia after le illness lasting eleven days. The pathologists e post-mortem attendant may have been infected dling organs from case 5, or more probably by g droplets resulting from splashing or cutting such as the lung. It is of interest in this connexion post-mortem attendants are listed amongst the ases of Q fever described by Beck et al. (1949). ossible danger of infection at post-mortem exami- of patients dying of atypical or virus pneumonia l be borne in mind.

estigation of case 5's household, in a coastal town th-east England, showed that his wife (case 6) lso infected; and efforts to find their source of ion have revealed that cattle, farmers, and dairy- rs in that district have serological evidence of ion and that *R. burneti* is present in raw milk from of the farms in the area. The cows show no signs less. The epidemiological relationship of cases 7 to the others (1–5) at the Royal Cancer Hospital is ot clear. Probably they were infected from some source, but this is still under investigation.

ISOLATION OF A RICKETTSIA

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Q FEVER IN GREAT BRITAIN

CLINICAL ACCOUNT OF EIGHT CASES

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LAST July, two members of the staff of the Royal Cancer Hospital fell ill with symptoms and signs which strongly suggested Q fever. The diagnosis was confirmed by serological tests and by isolating *Rickettsia burneti* from one of them, and a search revealed six further cases. The epidemiology and isolation of the organism are discussed by MacCallum et al. in an accompanying paper.

This is the first time that Q fever has been detected in the active state in this country; but the disease may prove to be not uncommon here.

Nearly a thousand proved cases have been published (Huebner et al. 1949, Beck et al. 1949); and it is now known that hundreds of cases arose in Italy and the Balkans during the late war, though these were called "Balkan Grippe" by the Germans (Imhäuser 1943) and atypical pneumonia by the British (Turner 1945). This experience is large enough for a clear clinical picture to be drawn, especially as all cases are remarkably similar except in severity.

CLINICAL FEATURES

The fever starts suddenly, and it is often possible to time its beginning to the hour. At first the symptoms may be mild, so that the patient is not driven to bed for several days. The temperature is high, 104°F being quite common. It sometimes falls to normal more than once a day; and these swings are accompanied by rigors and drenching sweats. In view of the high temperature the pulse-rate is remarkably slow; it often remains at 70 per minute. When the attack is fully developed prostration is even more severe than might be expected from the height of the fever. Delirium is quite common, and typhoid state and coma have been reported. Muscle and back aches are early symptoms, but these are soon overshadowed by headache, which is continuous behind the eyes or at the back of the head. Patients are wary of changing position and try to stifle coughing lest this aggravate the headache; they may prefer to be in a shaded room, but meningeal rigidity is absent.

Within a week a tickling unproductive cough begins, but it rarely develops further, though sputum and even small hæmoptyses have been described. In the original Australian cases (Derrick 1937) no chest signs were noticed, but they are now known to be constant though perhaps not prominent, in any moderately severe case. These signs consist in a small patch of persistent tissue-paper crepitations and high-pitched bronchial breath-sounds, usually at the base. In a recent American series (Beck et al. 1949) more obvious signs have been found, especially in older people, indicative of frank lobar consolidation, and pleuritic friction and fluid. The radiological signs are clearer, and since they may persist for weeks they have been used as a method of surveying infected persons during an outbreak. These suggest lobular partial consolidations, usually at the base though any lobe may be affected; collapse and pleural effusion may be seen.

Certain striking absences in the symptomatology should be noted. Apart from the anorexia and nausea of fever, gastro-intestinal symptoms are rare. There is no skin rash such as characterises many other rickettsial infections. There is no coryza as is common in acute respiratory disease due to viruses. Complications are hardly ever seen.

The course is variable; usually the disease persists for a week; but mild and subclinical infections are relatively numerous. Occasionally fever remains high for a few weeks, or even a month; termination is by
Relapse of fever has been noticed (Commission on Respiratory Diseases 1946); and 4 cases have recorded in which a low continued fever was
to a frank attack of Q fever—in 1 case as long
years before (Beck et al. 1949). Postfebrile
and aching and weakness in the legs may be
weeks or months, especially by older people.
death-rate in clinically ill cases appears to be in
neighbourhood of 1 in 500; fatalities are mostly con
to people over fifty years of age suffering from
other, chronic, disease.

Although the clinical manifestations are very const
they do not easily serve to distinguish Q fever
short-term fevers. In fact Q fever has usually dr
attention to itself by its epidemic constitution. It
first observed as a fever peculiar to slaughterhou
and was next seen among other kinds of cattle
it became an "occupational" fever. The M
cases did not show special contact with cattle,
physician could fail to recognise a disease
the explosive outbreaks that were seen there.
outstanding features were: the explosive
high attack-rate, restriction to military units
certain quarters, and absence of an associated
in upper-respiratory infections. Subsequent expe
has confirmed the remarkable absence of any case-to-c
spread.

TREATMENT

The sulphonamides, penicillin, and probably strep
mycin, are useless. Chloramphenicol is very effect
against other rickettsial diseases such as typhus, scru
typhus, and Rocky Mountain spotted fever; but th
are no published records of its use in Q fever. 'Au
mycin' has a very powerful suppressive action on exp
mental infections of eggs and guineapigs with
rickettsiæ of typhus, scrub-typhus, Rocky Mount
spotted fever, and Q fever (Wong and Cox 1948). Ag
typhus and spotted fever in man it has had only a lim
trial; but 19 cases of Q fever have been treated (Len
et al. 1948). The results were promising, though 1 not
failure was seen and in others cure was delayed.

CASE-RECORDS

Case 1.—A pathologist, aged 29, who made the post-mor
examination of case 5, had malaise from July 11 to 13.
the 14th he had pain in the buttocks and frontal head
relieved by aspirin; the temperature in the evening
103°F. On the 16th he was admitted to hospital with fever and lethargy, having vomited after breakfast.

Frontal headache was very severe and he insisted on his room being darkened. There was no neck rigidity. Intermittent fever, rising to 105°F, persisted for seven days, but the pulse-rate remained between 80 and 110 per min. (see fig. 1). He had several rigors daily and drenching sweats. By day he was irritable and by night slightly delirious. The total white blood-cell count remained around 7000 per c.mm.

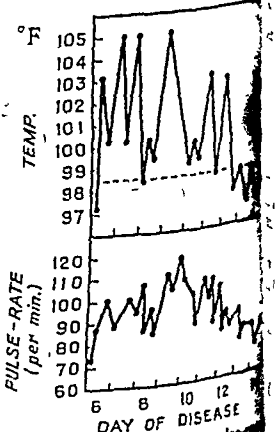

Fig. 1—Temperature and pul
in case 1.

On the 17th a tickling cough started, with "rawness" of the trachea. On the 20th there was a patch of tubular breath-sounds at the base of the right lung, and
radiography showed consolidation of this area. He develop
a furuncle in the ear and a small ulcer inside the cheek.

On the 21st, at 8 P.M., he was given chloramphen
3·5 g., followed by 0·25 g. every three hours for the

y-six hours (total 6·25 g.). On the morning of the 22nd emperature rose to 102°F, but thereafter it was normal; ever had lasted twelve days. He continued to be miserable photophobic for a further twenty-four hours, during which he had dryness of the mouth and sudden attacks of go, possibly due to the drug. He was discharged on 24 and returned to work ten days later, feeling well. X-ray changes cleared between Sept. 1 and Oct. 5.

e titre of complement-fixing antibodies to *R. burneti* less than 1/10 on July 21 and rose to 1/640 by Aug. 9. *rneti* was isolated from the blood.

se 2.—On the morning of July 10, a nurse, aged 30, had nursed case 5 and laid out the body, suddenly n to have severe frontal and occipital headache. This somewhat relieved by aspirin, but she had to take so that she vomited. She continued to work for four days, n the fourth day had aches and pains all over the body. day (July 14) she went to bed with a temperature 4°F, and pulse-rate 120 per min.; she was perspiring sely and had a rigor lasting three minutes. There was ophobia but no neck rigidity; she had to remain still for of making the headache worse.

the 15th a small patch of crepitations and faint tubular hing was detected posteriorly at the right base, but tero-anterior radiogram showed nothing abnormal. The white-cell count was 9200 per c.mm. A lumbar puncture done because it was suspected that the patient and olleagues were fearful of meningitis. The cerebrospinal was chemically and cytologically normal; the pressure not measured.

e fever fell by lysis in the next three days, having lasted days. The patient was discharged on the 19th and was at work a week later.

e titre of complement-fixing antibodies for *R. burneti* /10 on July 20 and rose to 1/320 by Aug. 9.

th case 1 and case 2 had the typical symptoms of ver and were clinically diagnosed as such. Case 1 moderately severe.

se 3.—A necropsy-room attendant, aged 51, who had ed at the post-mortem examination of case 5, became ally ill about July 9. He felt weak and had very severe che: "I tried everything but it was no good." He came very hot about twice a day and could not sleep for sness. He had always been "chesty," and his cough ne worse after about five days. Sulphonamides and illin had no effect.

the 16th he was admitted to St. Helier Hospital under are of Dr. C. P. Petch. He was described as an obese oric man with chronic bronchitis and emphysema; were râles at both bases. For six days he ran a nued fever of 102–103°F; the pulse-rate varied from 108 per min. (fig. 2). He was drowsy most of the and complained of no particular symptoms apart being "downright ill." Total white-cell counts of 6900 300 per c.mm. were recorded during the fever.

sputum was purulent and intermittently streaked with . X-ray examination of his chest, on admission, showed y consolidation in the right upper lobe. Another film ly 30 showed a small effusion at the lower end of the right ue fissure and bronchopneumonia in both lungs. The changes cleared between Aug. 16 and Oct. 13.

July 22 he felt much better; his temperature fell to and was normal the next day. He got up, but between 29 and Aug. 1 he had three sharp rises of temperature leuritic pain in the front of the right side of the chest. ion was thought to be heard here, and, more certainly, e left base at the end of the first week in August. Râles nued in his chest throughout his stay in hospital and were present in October.

nvalescence was slow. He did not feel quite well when turned to work at the beginning of October. In the le of October he was still complaining that his legs , and he felt that it was too much trouble to walk about. as not sleeping as well as usual. He has not been out of and since the first world war.

e titre of complement-fixing antibodies for *R. burneti* /640 on Sept. 1.

hen first seen this patient was thought to have a lung tion secondary to chronic bronchitis. The diagnosis soon changed to atypical pneumonia, and aureo- n would have been given on July 22 had not his temperature started to fall. Looking back on the case, the usual characters of moderately severe Q fever can be distinguished, though veiled by chronic bronchitis. Relapse is uncommon in Q fever though it may be commoner in older people than our first experience in young soldiers led us to believe. It is not possible to say whether the recurrence of fever at the end of July was due to Q fever or to bronchitis.

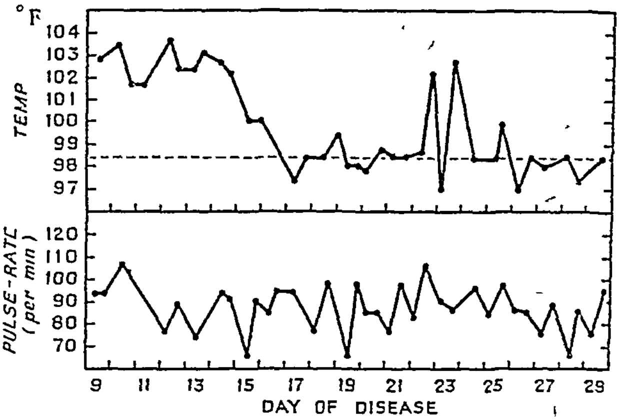

Fig. 2—Temperature and pulse-rate in case 3.

Case 4.—A pathologist, aged 50, who watched the post-mortem examination of case 5, gives this retrospective account: "On about July 1 I began to have pain in the lower abdomen, mainly on the right side. It was continuous and aching and spread into the groin and right testicle. I had borborygmi; my bowels were slightly irregular; and I do not think I had any fever. These symptoms continued with a gradual crescendo until I went to bed on July 13 with a temperature of 102°F. By that time the pain in the abdomen and testicle was quite prominent and distressing. I had no cough and no more headache than would be expected with the fever. My urine was normal and the white-cell count 6500 per c.mm. On July 14 Dr. F. Avery Jones saw me. He found that my chest was normal and suggested that I had some vague intestinal infection. He put me on phthalysulphathiazole. On the 16th I was well and on the 17th out of bed; and on the 18th I was back at work."

Thus fever had lasted 1–2 days. The patient is an Australian, but has lived in England since 1945 except for a holiday in Norway in 1948.

The titre of complement-fixing antibodies for *R. burneti* was 1/80 to 1/60 on Sept. 1.

This illness is quite unlike Q fever, in which all observers agree that abdominal symptoms are notably absent. It started only a week after the patient attended the post-mortem examination of case 5—which is too short an incubation period. Nevertheless he must have been infected in England unless his antibodies remained high for over four years after an unrecognised infection in Australia. The fever which finally sent him to bed on July 13 occurred at a time consistent with infection at the post-mortem examination of case 5. Probably he was suffering from some intestinal infection, complicated at the end by a very mild attack of Q fever.

Case 5.—A man, aged 78, was admitted to the Royal Cancer Hospital in May, under the care of Mr. R. W. Raven. He complained of dysphagia, which turned out to be due to bulbar palsy; when he swallowed barium it flowed into the bronchi.

Nearly three weeks after admission—on June 14—his temperature suddenly rose to 102°F (fig. 3). Fever continued and was unaffected by sulphonamides or penicillin. He had signs of pneumonia and developed auricular fibrillation. He regurgitated food, became incontinent, and rapidly sank into coma, dying eleven days after the onset.

Post-mortem examination on June 25 confirmed the cerebral degeneration. The spleen was slightly enlarged, soft, and mushy; there was pronounced reactive hyperæmia.

In the lungs the right lower lobe was completely consolidated with lobar pneumonia; there was red hepatisation in the upper part and grey in the lower. The left lung was congested but otherwise normal. All bronchi were congested, those on the right being filled with mucopus. The trachea was slightly congested and contained much mucopus. Histologically the pneumonia showed unusual features. It was diffuse and yet unlike either classical lobar pneumonia or confluent bronchopneumonia. In the early stages the reaction was notably œdematous. In the fully developed lesion there were many mononuclear cells in the exudate, and the interstitial connective-tissue was widened by inflammatory changes. There was a relative scarcity of neutrophil polymorphs and fibrin. This picture resembles that of a fatal case of Q fever described by Lillie et al. (1941). The absence of food particles and of suppuration excludes the possibility of inhalation pneumonia, and the reaction is unlike that of lipoid pneumonia.

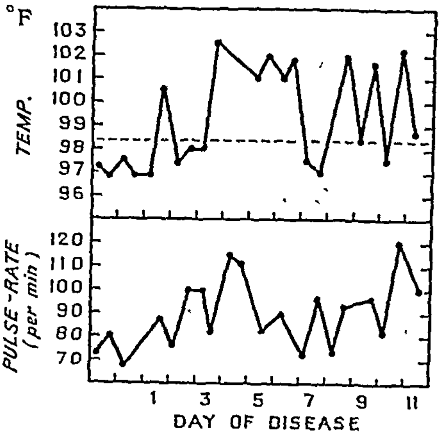

Fig. 3.—Temperature and pulse-rate in case 5.

Preliminary attempts to find rickettsiæ by a modified Giemsa method show minute pink coccoid bodies which may be of significance. A fuller description will appear elsewhere.

Bronchopneumonia was expected, and nothing unusual was suspected when it developed. Q fever did not break out in the hospital until over two weeks after this patient's death. Retrospectively, however, it is presumed that he had Q fever, on the following grounds: (1) the histological changes in the lung; (2) the serological evidence of infection in his wife (case 6), who had never visited the Royal Cancer Hospital but, like the patient himself, is known to have been in contact with an endemic focus at their home on the south-east coast; and (3) the link afforded by this patient between this focus and the hospital cases. Detailed epidemiological evidence will be presented in a further publication.

Case 6.—In this patient, the wife of case 5, there is no reliable history of recent fever. A complement-fixation test for *R. burneti* antibodies showed full fixation at 1/320 and 50% fixation at 1/640.

Case 7.—The patient, a physicist, aged 40, suddenly felt weak and feverish at 11 A.M. on Sept. 7. He carried on but spent a restless night. The next day he tried to work but was admitted to hospital. He felt hot and "swimmy," with slight aching in bones and joints. There was no constant headache, but "the top of my head lifts off if I cough." He ran a fever of 100–103°F for three days, after which the temperature fell by lysis. The fever had lasted altogether five days. He had rigors and drenching sweats though his fever at no time was very high. The pulse-rate was constantly 70–80 per min.

Slightly tubular breathing and faint tissue-paper crepitations were heard at the left lung base on Sept. 8. X-ray examination showed no abnormality. On Sept. 10 the total white-cell count was 10,400 per c.mm.

He returned to work on Oct. 3 but did not feel fit until two weeks later; meanwhile he felt "woolly" in the head, could not concentrate, got palpitations and went hot with exercise, and his legs felt too dead to move.

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The clinical features of Q fever are described. Eight cases arising in England are reported.

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SURREY

The cerebral palsy unit at Queen Mary's Hospital Children, Carshalton, was the first unit in the Brit Isles set up specifically for the treatment of children wit this condition.[1] Since other units have been, or are bein established in this country, an account of some of o experiences may be of value.

At first, children up to the age of 16 years w accepted; but, though the results were encouraging became evident that the earlier the child was treated better was the result obtained. Later we concentrated children under the age of 5 years, but again it became apparent that the youngest age-groups trea gave the more promising results; so now we try to the children under the age of 6 months. Unfortunately it is commonly taught that cerebral palsy is not rec le until the child is aged 2 years or even more. xperience has taught us that it can be recognised before that, and when all such children are recog- and treated in infancy it should be possible to nt much of the deformity now associated with al palsy. We have therefore concentrated here on gns that should lead one to suspect the disorder in s.

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ÆTIOLOGY

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Hearing.—The child may be deaf, either completely or to certain tones, but in an infant this is very difficult to ascertain and is not likely to be of much help in diagnosis.

Sucking.—Since sucking is one of the first instinctive actions of the baby, any difficulty in feeding should be investigated, because it may be one of the first signs of cerebral palsy. Dribbling from the mouth after the first few months should suggest cerebral damage, but it should not be forgotten that dribbling is common in mentally defective children.

Smiling.—One of the first actions of a baby is to smile, which he should begin to do at the age of 4–6 weeks, and smiling should be well developed by the age of 2 or 3 months. If the baby does not smile or is slow to smile, cerebral palsy should be suspected. Mentally defective babies, on the other hand, generally smile very easily.

Development.—In comparing the development of a normal baby with that of one with cerebral palsy we are indebted in our statements about the normal baby very largely to Aldrich[3] among others, but independently one of us (E. C.) has been making observations on the same subject for many years. Aldrich points out that, when a baby aged 3 months is picked up, his head may come up with him without dropping back; many babies at that age can balance their heads on their shoulders. When a baby aged 3 months with cerebral palsy is picked up, the head will probably drop back. At 4 months a normal baby begins to learn control of his arms and legs and to grasp things, whereas the baby with cerebral palsy gives no evidence that he is learning control. At 6 months a normal baby may be trying to sit up and, when sat up, stretches out his arms; from that age onwards he starts trying to move round, first learning to kick his legs and slowly trying to crawl round his cot, eventually trying to pull himself up by the sides of the cot until he can stand a little holding on, and next trying to walk. A baby of 6 months with cerebral palsy cannot do these things if the lesion is severe; if it is less severe, movement is limited and delayed in development, particularly movement of the legs. The mother is naturally the person who first observes these movements or the lack of them; therefore she should be closely questioned about them.

Aversion of Head while Prone.—After the age of 6 months a normal baby tries to see what is going on round him, he tries to crane his neck to see things, and he tries to roll over, whereas a baby with cerebral palsy lies helpless and cannot crane his neck, roll over, or, if prone, avert his head. Such a child may be suffocated owing to this inability to turn his head while prone.

Grasp.—As pointed out above, grasp at first is a reflex action; if one puts a finger into each fist of a baby aged less than 3 months one can lift him because of the reflex action. When a little older the baby will let go if lifted in this way. A baby with cerebral palsy can still be lifted by the clenched fists some weeks or months after the age of 3 months, not only because the clenching of the fists is a reflex action, but also because he cannot let go, owing to lack of voluntary control of the muscles.

Flexion of Knees on Lifting.—If one holds up a normal baby aged 6–12 months by grasping him under the armpits, he tends to flex the knees and hips, whereas a baby with cerebral palsy, when so lifted, keeps the legs straight, possibly crossed, and perhaps with the toes pointing downwards.

Abduction of Legs.—It is easy to abduct the legs of a normal recumbent infant of 6 months, but it may be difficult to abduct, in the same conditions, those of a baby with cerebral palsy. Even when the palsied baby congested but otherwise normal. All bronchi were congested, those on the right being filled with mucopus. The trachea was slightly congested and contained much mucopus. Histologically the pneumonia showed unusual features. It was diffuse and yet unlike either classical lobar pneumonia or confluent bronchopneumonia. In the early stages the reaction was notably œdematous. In the fully developed lesion there were many mononuclear cells in the exudate, and the interstitial connective-tissue was widened by inflammatory changes. There was a relative scarcity of neutrophil polymorphs and fibrin. This picture resembles that of a fatal case of Q fever described by Lillie et al. (1941). The absence of food particles and of suppuration excludes the possibility of inhalation pneumonia, and the reaction is unlike that of lipoid pneumonia.

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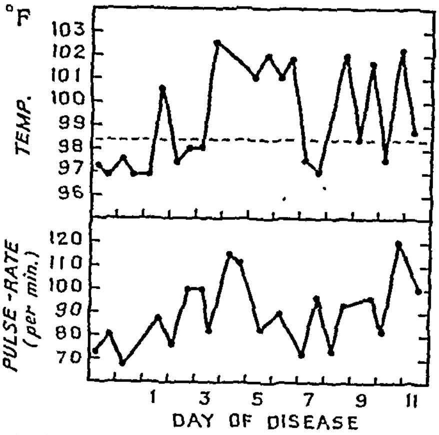
[3] Aldrich, C. A. Rochester Child Health Progress Bulletins. Rochester, Minn., 1949.



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Smiling.—One of the first actions of a baby is to smile, which he should begin to do at the age of 4–6 weeks, and smiling should be well developed by the age of 2 or 3 months. If the baby does not smile or is slow to smile, cerebral palsy should be suspected. Mentally defective babies, on the other hand, generally smile very easily.

Development.—In comparing the development of a normal baby with that of one with cerebral palsy we are indebted in our statements about the normal baby very largely to Aldrich[3] among others, but independently one of us (E. C.) has been making observations on the same subject for many years. Aldrich points out that, when a baby aged 3 months is picked up, his head may come up with him without dropping back; many babies at that age can balance their heads on their shoulders. When a baby aged 3 months with cerebral palsy is picked up, the head will probably drop back. At 4 months a normal baby begins to learn control of his arms and legs and to grasp things, whereas the baby with cerebral palsy gives no evidence that he is learning control. At 6 months a normal baby may be trying to sit up and, when sat up, stretches out his arms; from that age onwards he starts trying to move round, first learning to kick his legs and slowly trying to crawl round his cot, eventually trying to pull himself up by the sides of the cot until he can stand a little holding on, and next trying to walk. A baby of 6 months with cerebral palsy cannot do these things if the lesion is severe; if it is less severe, movement is limited and delayed in development, particularly movement of the legs. The mother is naturally the person who first observes these movements or the lack of them; therefore she should be closely questioned about them.

Aversion of Head while Prone.—After the age of 6 months a normal baby tries to see what is going on round him, he tries to crane his neck to see things, and he tries to roll over, whereas a baby with cerebral palsy lies helpless and cannot crane his neck, roll over, or, if prone, avert his head. Such a child may be suffocated owing to this inability to turn his head while prone.

Grasp.—As pointed out above, grasp at first is a reflex action; if one puts a finger into each fist of a baby aged less than 3 months one can lift him because of the reflex action. When a little older the baby will let go if lifted in this way. A baby with cerebral palsy can still be lifted by the clenched fists some weeks or months after the age of 3 months, not only because the clenching of the fists is a reflex action, but also because he cannot let go, owing to lack of voluntary control of the muscles.

Flexion of Knees on Lifting.—If one holds up a normal baby aged 6–12 months by grasping him under the armpits, he tends to flex the knees and hips, whereas a baby with cerebral palsy, when so lifted, keeps the legs straight, possibly crossed, and perhaps with the toes pointing downwards.

Abduction of Legs.—It is easy to abduct the legs of a normal recumbent infant of 6 months, but it may be difficult to abduct, in the same conditions, those of a baby with cerebral palsy. Even when the palsied baby is held upside down by his legs, abduction of his thighs is still limited.

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[2] Evans, P. R. *Arch. Dis. Childh.* 1948, 23, 213.

[3] Aldrich, C. A. Rochester Child Health Progress Bulletins. Rochester, Minn., 1949.

Inversion.—When a normal baby is held upside down by the legs, his arms drop and his head reflexly extends, whereas if a baby with cerebral palsy is so held, his arms do not drop, or possibly only one drops, and his head does not extend.

Stretch Reflex.—If a forearm of a baby aged more than 3 months is passively flexed on the upper arm and then sharply extended it moves freely, whereas in cerebral palsy the forearm seems to resist extension. If a leg is flexed on the thigh and sharply extended, a similar resistance is obtained in cerebral palsy of the spastic type. This stretch reflex persists and can be elicited even when the child has been trained to use his limbs normally; we do not yet know whether it eventually disappears.

Retention of Fœtal Characteristics.—A normal baby aged 6–12 months, if sat up, has a straight back, but a baby of that age with cerebral palsy tends to retain the fœtal position with a curved back, and this may persist until the child is 3 or 4 years old or even later.

DIAGNOSIS OF ATHETOID CEREBRAL PALSY

In the athetoid type of cerebral palsy the signs are somewhat different. Since there is no spasticity, some of the signs described above are absent, but instead there are athetoid movements when the child tries to do anything. In the tension athetoid type muscular tension may be mistaken for spasticity but it is not continuous; if one watches carefully, the tension relaxes, and the limbs can then be moved easily. The wriggling irregular movements of the tongue, which have already been mentioned, may prevent the child from swallowing properly, sucking, or speaking, and thus cause dribbling from the corner of his mouth. Similar lack of control of other muscles prevents aversion of the head in the prone position. Abduction of the legs is easy, unless there is tension; the stretch reflex is not present; but the head is not extended when the child is inverted.

The variation of these signs in the athetoid makes diagnosis more difficult in athetoids than in spastics. In our experience athetoids do not show spasticity, and spastics do not show athetoid movements, but other workers do not agree that this division is always so clear-cut.

SOME OTHER TESTS

Other infantile reflexes besides those already mentioned can be tested.

Moro or Startle Reflex.—The infant's reaction to a sudden loud noise or other stimulus is noted. A normal baby quickly abducts its arms and legs and then bows them, but this gets less as the baby grows and becomes restricted to a body jerk at the age of 6 months or so, whereas in cerebral palsy the reaction persists undiminished owing to lack of muscular control. This sign is not of such practical use as those described above, because some conditions—e.g., deafness—prevent any reaction.

Neck-righting Reflex.—When the head is turned, the body normally turns as well. In cerebral palsy this reflex may be present, but equally it may be absent.

Tonic Neck Reflex.—There are two types of this: asymmetrical, in which, when the face is turned to one side, the opposite arm adducts and flexes; and symmetrical, in which, when the head is bent, the arms come forward. These are reflexes in the infant and are modified when voluntary movement is established. In cerebral palsy, especially the spastic type, they tend to persist.

Creeping Reflex.—When a normal infant under the age of 6 months, who has not yet reached the crawling stage, is placed prone and the sole of one of his feet is gently pushed, he usually draws up that leg, and sometimes the opposite arm, and projects his body When a child reaches the crawling stage, this gradually disappears, being superseded by movements. In spastic cerebral palsy this reflex persist for some time after it should have been m

Our experience with these tests is that, interesting, they do not give such practical diagnosis as those we have described.

DIFFERENTIAL DIAGNOSIS

Where there is damage to the motor areas or mo paths there is motor disability, and though, stri speaking, the term "cerebral palsy" should co any motor disability due to cerebral damage, it is u to describe a particular variety of motor disabilities, s in diagnosing the condition we have to distinguish t variety from others. Broadly speaking, the ch conditions from which it has to be distinguished mental deficiency with consequent motor disability, a amyotonia congenita.

Mental Deficiency.—Amentia causes motor disab but in mentally deficient infants, though spasticity seem to be present the child smiles, the tongue ments are free, the limbs are relaxed at times, and is free voluntary movement. Such an infant may unable to sit up, but when he is lying down he does convey the impression of fixity characteristic of spa cerebral palsy, or the wriggling jerky movements athetoid cerebral palsy. About 25% of children w cerebral palsy are mentally deficient, but in these ca the mental defect is added to the physical palsy, practical purposes we may take it that mental defe only associated with the spastic type of cerebral p

We do not wish to convey the impression that diagn in these cases is easy. In our cerebral palsy unit at Q Mary's Hospital for Children we admit every child f probationary period of up to three months, becau an infant whose physical movements are so limited in an older child who cannot speak, it is often extr difficult to assess the mental condition, but the gr our experience the easier are we finding it to do so.

Amyotonia congenita should not cause much diffic It is relatively rare and the disability is a loss of p rather than spasticity or athetosis. The voluntary m ments are present but weak; the reflexes are dimini or absent; and such movements as these children make are characterised more by the flexibility o body than by rigidity. In very young infants the nosis might be difficult at first, but if they are kept observation for a short time any doubt should be reso

TREATMENT

The importance of the early recognition of ce palsy is that, when the condition is recognised ear results of treatment are superior to those obtained the disorder is only recognised at a later age. The ment must be individual and be related to the e cause of the condition. The treatment of spasticity be different from that of athetosis, and the treatm of the ataxic type different from either.

CONCLUSIONS

The treatment of cerebral palsy is most succes when it is started in early infancy.

It is usually possible to diagnose cerebral palsy be the child is six months old.

The points to look for are: absence or very development of control of the facial and throat mus shown by lack of smiling; difficulty in swallow dribbling; slow stiff movements of the tongue; movements of the eye, and squint; deafness; clench of the fingers with apparent inability to open the irregular movements of the arms; inability of the ch to alter its position when lying down; and lack of l movements of the lower limbs. At the age of 6–12 ths the affected child does not attempt to crawl or imb up in his cot, and the normal flexing of the s is absent. As the child gets older this picture of r disability becomes clearer, until at the age of urs it is so clear that few people cannot recognise it. 25% only of cases of spastic cerebral palsy mental iency is added to the physical disability.

A SUGGESTED METHOD FOR THE IRATION OF CERTAIN ANTIBIOTICS

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eming and Smith (1947) have described the estima- of penicillin in serum using a culture medium posed of serum water, glucose, and an indicator, ol red; where growth occurs the sugar is fermented, indicator turns from red to yellow, and the serum ins are precipitated. A similar technique for the ation of streptomycin was used by May et al.). Experiments with these two antibiotics show at that the end-point in such titrations of streptomycin ch sharper than in those of penicillin. This is to be cted from the work of Abraham and Duthie (1946) showed that an acid agent such as penicillin is more e in a relatively acid medium whereas the reverse e of a base, such as streptomycin; when the organ- grows and acid is formed, penicillin will become and streptomycin less effective, with the result the end-point with penicillin is poorly defined but of streptomycin is sharp. 'Aureomycin,' a base, is ception to this rule (Paine et al. 1948), possibly se of its more rapid destruction in alkaline solution. the titration of penicillin is to depend on the change lour of an indicator, it is clearly desirable that when th takes place the reaction should become more line, and it seemed possible that the addition of urea e medium might give the required result if a sensitive nism producing urease could be found to release onia from the urea. Fortunately the Oxford staphy- ccus proved to be suitable, and it has been used in all tests to be described.

periment showed that concentrations of urea of 5% or more in broth acidified to pH 6·5–6·8 yielded gh ammonia after overnight incubation to give a tion of pH 8·3 or more, thus traversing the range of ol red, and in practice 0·5% urea has been used. a tends to break down in the autoclave, but steaming es only a minor rise in pH—which might, however, influence slightly the result of an accurate titration of a standard solution. The size of the inoculum is of greater significance, since on it depends the amount of urease carried over from the parent culture; in practice 0·1 ml. of overnight broth culture has been added to 10 ml. of urea broth, giving a final concentration of 1 in 200 after mixing in equal volume with the dilutions of penicillin in water or saline. These minor disadvantages disappear for practical purposes in the usual titration where the concentration in serum or body fluid is matched against a standard; it should be noted, however, that undiluted serum is alkaline enough to affect the reaction of the broth, and its reaction should therefore be adjusted where low concentrations of penicillin are to be expected.

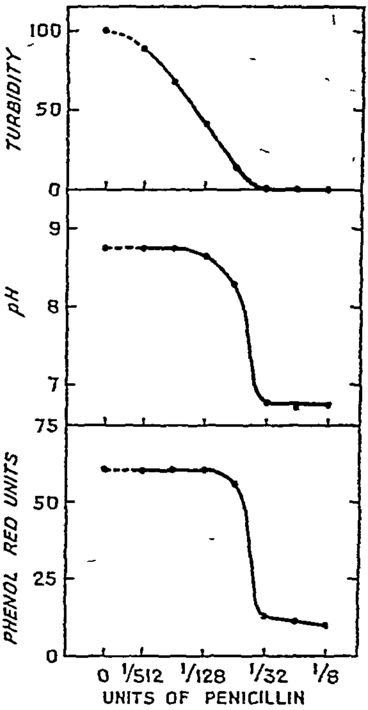

Fig. 1—Staphylococcus medium with increasing amounts of penicillin.

The table shows the results of titrations of penicillin and aureomycin solutions in serum water containing glucose and phenol red, in nutrient broth, and in acidified broth containing 0·5% urea and phenol red. The stated concentrations of the drugs fall by one-third from tube to tube but are otherwise only nominal, especially in the case of aureomycin, since accurately standardised solutions were not available. The readings were based on colour change and protein precipitation in the serum-water series, on turbidity in the broth tubes, and on colour change in the urea-broth series. It will be obvious that the end-point with both drugs is much sharper in the urea-broth series than in the others; we would suggest that the interval showing the greatest change should mark the end-point, giving readings in this case of $^1/_{27}$ unit of penicillin and 0·8 µg. of aureomycin. It may be of interest that after another day's incubation the end-point with aureomycin was clear-cut at 2·7 µg. in the urea-broth series but unreadable in the others.

RESULTS OF TITRATION OF PENICILLIN AND AUREOMYCIN IN VARIOUS CULTURE MEDIA

Culture medium	Penicillin (units per ml.)								
	$^1/_8$	$^1/_{12}$	$^1/_{18}$	$^1/_{27}$	$^1/_{40}$	$^1/_{60}$	$^1/_{90}$	$^1/_{135}$	0
ose serum water * ..	–	–	±	+	++	++	+++	Not done	++++
th	–	–	–	–	±	+	++		++++
a broth	–	–	–	±	+++	++++	++++		++++

Culture medium	Aureomycin (µg. per ml.)								
	4	2·7	1·8	1·2	0·8	0·53	0·35	0·23	0
cose serum water ..	Trace	Trace	±	±	+	+	++	++	++++
oth	–	–	±	+	+	++	++	+++	++++
a broth	–	–	–	–	+	+++	++++	++++	++++

* Glucose broth gives a sharper end-point than serum water with the Oxford staphylococcus as test organism.

This suggests that the acidity of the medium is of value in maintaining the activity of the drug, although the shift in the end-point underlines the importance of the size of the inoculum and the length of incubation in titrating bacteriostatic agents such as aureomycin or 'Chloromycetin.' The latter drug, incidentally, being neither acid nor base, can be titrated with apparently similar results in either medium.

Fig. 1 shows three curves obtained from a titration of penicillin in the presence of urea, the concentration being halved in successive tubes. Turbidities, expressed as a percentage of the control, were measured by a photo-electric absorptiometer at a wave-length of 650 mμ and pH values were obtained by means of the glass electrode. Estimations of the colour change of phenol red were made as follows: the medium was centrifuged at 4800 r.p.m. for 5–10 minutes in an angle centrifuge; to 3 ml. of the clear supernatant was added 1 ml. of phenol-red solution (saturated aqueous phenol red diluted 1 in 10), and the colour was determined in arbitrary "red units" by means of a photo-electric absorptiometer using Ilford Filter no. 606 (Spectrum Yellow). The turbidity curve approaches a straight line, starting at $^1/_{32}$ unit and increasing to $^1/_{512}$ unit where growth is almost as heavy as in the control. The other two curves show that the change in reaction, due to the production of ammonia, occurs mainly between $^1/_{32}$ and $^1/_{64}$ unit and ceases at pH 7·75.

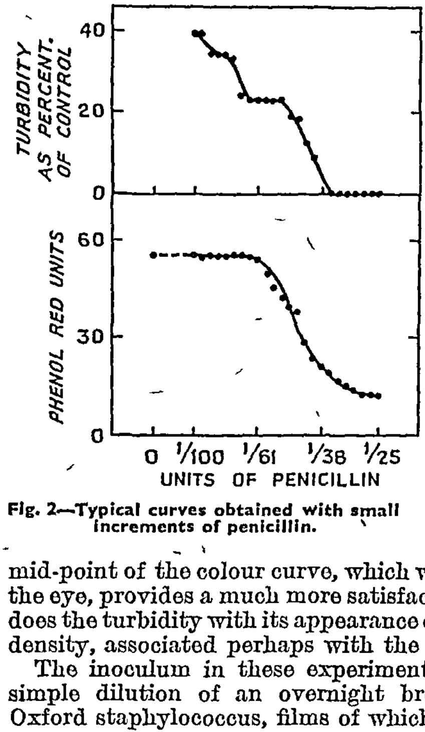

Fig. 2—Typical curves obtained with small increments of penicillin.

Fig. 2 illustrates a more elaborate titration with a fall in the concentration of the drug of about 6% from tube to tube. The mid-point of the colour curve, which was clearly visible to the eye, provides a much more satisfactory end-point than does the turbidity with its appearance of steps of increasing density, associated perhaps with the change in reaction.

The inoculum in these experiments was obtained by simple dilution of an overnight broth culture of the Oxford staphylococcus, films of which show considerable clumping—enough probably to account for minor variations which have been seen in duplicated titrations. Where a high degree of accuracy is required, it would be necessary to find a sensitive strain less apt to form clumps and to remove such clumps as might be present. Not all strains of staphylococcus produce urease freely, the Oxford staphylococcus being unusually active in this respect. The hæmolytic streptococcus which is commonly used as test organism in the serum water and glucose medium does not appear to break down urea. The growth phase of the parent culture, the period of incubation, the size of the inoculum, the percentage of urea, and the primary reaction of the medium would also need consideration.

DISCUSSION

Mitchison et al. (1949) have drawn attention to the inaccuracies liable to occur in the routine use of the micro-method described by May et al. (1947) for the titration of streptomycin in serum. Venepuncture, however, in skilful hands, though more nuisance to the operator, is little more distressing to the patient than a finger-prick, and the larger volume of serum more accurate measurement by graduated pi test-tubes. Further, with a sharp end-point such obtained with a glucose medium and streptom with urea broth and penicillin or aureomycin, differences between successive tubes in the con titration of the standard solution might be con reduced and thus remove one source of error.

SUMMARY

A method is described for the accurate titratio antibiotics, such as penicillin and aureomycin, which more active in acid than alkaline solution.

ADDENDUM.—Experience has shown that serum, from its slight buffering action, interferes to some e with either the production or the activity of urease therefore advisable to use 20% serum water in making dilutions of the standard solution and of serum under te

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RETICULOCYTE RESPONSE TO LIVE THERAPY IN PERNICIOUS ANÆMIA

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IN pernicious anæmia one of the first signs of incre production of red cells after liver therapy is a increase in the number of reticulocytes in the circula blood. The degree of this reticulocyte response crisis, is inversely proportional to the *initial* red count—i.e., the lower the initial red-cell count greater is the reticulocyte response. Many workers tried to find a formula for this relationship; the known is that of Riddle (1930).

Though the clinical value of such formulæ has been disputed, especially by Murphy (1936), they to be still accepted. Failure to reach the expected re locyte peak is often regarded as a warning either of inaccuracy of the diagnosis or of the unreliabilit the liver preparation used. I have therefore exa anew the published reports which seem to support reliability of these formulæ, and investigated personal cases.

INVESTIGATION

Of 75 patients admitted with a diagnosis of pernic anæmia 47 afforded sufficient hæmatological data, suc daily red-cell and reticulocyte counts for at least a m

TABLE I—RELATION OF RETICULOCYTE RESPONSES TO CELL COUNTS BEFORE LIVER THERAPY

Red-cell count before treatment (millions per c.mm.)	Reticulocytes per 100 red cells on day of maximum response	Red-cell count before treatment (millions per c.mm.)	Reticulocytes per 100 red cells on day of maximum response	Red-cell count before treatment (millions per c mm)	Retic cyte 100 cells day maxi re
0 64	36 0	1·24	39 2	1 54	[illegible]
0·66	22·8	1·25	26 0	1·54	[illegible]
0 90	36 0	1·28	21·0	1 62	15·
0·96	21 4	1·31	55 0	1 62	[illegible]
1·02	29·6	1·35	32 8	1 63	1
1·02	28·0	1·36	18 1	1·87	14
1·04	16 9	1·36	22 0	1·90	1
1·07	40 0	1·40	18·5	1·98	11·
1·10	20·0	1·40	10·0	1·98	23·
1·16	11·8	1·40	10 0	2 08	5
1·17	17·5	1·43	25·6	2·32	13
1·19	52 8	1·46	36·2	2·35	7
1·20	26 0	1·46	30·2	2·45	6
1·20	20 0	1·50	16·8	2 52	[illegible]
1·20	18 2	1·52	22·0	2·74	10·
1·20	22 0	1·54	27·3	..	..

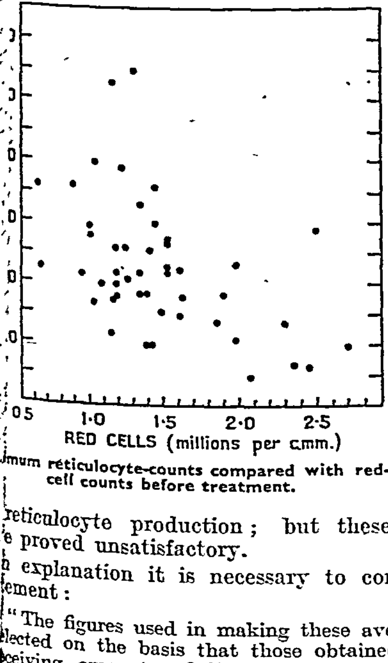
II—REPORTED RETICULOCYTIC RESPONSES TO LIVER EXTRACT COMPARED WITH INITIAL RED-CELL COUNTS

ell count fore tment llions c.mm.)	Present investigation		Minot et al. (1928)		Murphy (1936)		Zerfas (1931)	
	No. of cases	Av. reticulocyte-count and P.E. (%)	No. of cases	Av. reticulocyte-count and P.E. (%)	No. of cases	Av. reticulocyte-count and P.E. (%)	No. of cases	Av. reticulocyte-count and P.E. (%)
0·8	2	29·4 ± 4·50	6	57 ± 3·96	..	..	3	58·0 ± 2·67
8–1·0	2	28·7 ± 4·90	5	43 ± 1·59	..	..	5	44·4 ± 2·94
0–1·2	12	25·1 ± 2·10	9	28 ± 1·26	3	29·8 ± 2·26	10	43·0 ± 9·29
2–1·4	10	25·2 ± 2·94	10	28 ± 1·80	1	21·0	9	41·4 ± 2·12
4–1·6	8	25·9 ± 0·26	4	19 ± 1·60	2	17·4 ± 0·80	12	34·4 ± 7·64
6–1·8	3	18·3 ± 1·33	9	20 ± 0·87	3	25·6 ± 2·62	7	41·0 ± 0·92
8–2·0	4	16·9 ± 1·84	6	12 ± 1·80	..	..	3	27·6 ± 0·30

ther selection was made. The diagnosis was estab-l on blood-counts, bone-marrow biopsy, histamine-tory achlorhydria, and, last but not least, the icial effect of liver therapy. After a single large (20 ml.) of liver extract ('Exhepar' Certa, or ipolon' Bayer) red-cell and reticulocyte counts made daily. The results are summarised in table I compared with those of Minot et al. (1928), Murphy i), and Zerfas (1931) in table II.

DISCUSSION

ree-quarters of our results do not correspond to standards of Riddle (1930). When the results are ed as in the accompanying figure, there is no ablance either to a parabolic or to a hyperbolic curve. Several attempts have been made to correct Riddle's and other formulæ by considering the duration of the reticulocyte response. One proposal was to multiply the number of days by the observed reticulocyte-count, thus expressing the "volume" reticulocyte production; but these modifications e proved unsatisfactory.



mum reticulocyte-counts compared with red-cell counts before treatment.

n explanation it is necessary to consider Riddle's ement:

> "The figures used in making these average values are lected on the basis that those obtained from patients ceiving amounts of liver inadequate to produce an fective response, and those from patients in whom some hibiting factor obviously prevented a typical response, ere not used in compiling these statistics."

Riddle's use of the term "maximal response" implies, highest results only were taken into account, which quite permissible so long as this meaning of "maximal sponse" is kept in mind. There is good reason to ppose that even Riddle did not intend that his formula ould show what reticulocyte response is to be looked r in the average case encountered in practice; his rmula seems to have slipped into the textbooks as a sult of a misunderstanding of the meaning of "maxi-al" value, which was intended to represent the optimal apacity of the bone-marrow in *certain* cases. This aximal response cannot be expected in clinical practice. or instance, in cases with an initial red-cell count between 1,200,000 and 1,400,000 per c.mm. the following reticulocyte maxima were found: 10%, 12%, 18%. 20%, 22%, 22% (twice), and 26%; only two cases reached the predicted standard of 32% and 39%, their maxima being 52% and 55%. Though American liver preparations stimulate higher reticulocyte responses per unit dose, the range of variation reported with them is similar to that obtained in Europe. In table II data from the Eli Lilly laboratory (Zerfas 1931) are compared with our findings, and it can be seen that there is no substantial difference in reticulocyte response between patients with an initial red-cell count less than 1,000,000 per c.mm. and those with 1·2, 1·4, or 1·6 million per c.mm., so that the reticulocyte response plotted against the initial red-cell count will not give any curve.

Our biological experience teaches us that body functions are all subject to variation. Reticulocytes are the new red cells produced from pro-erythroblasts or megaloblasts on the administration of certain hæmopoietic factors stored in the liver. The anatomical extent of the bone-marrow and the rate of cell maturation cannot be accurately predicted, and are subject to wide variation. Therefore the reticulocyte response cannot be determined by the red-cell count before the administration of liver, because the initial red-cell count bears no relation to the quantity and quality of the bone-marrow. If there were any such relation, the magnitude of reticulocyte response would be a mere question of dilution. For instance, if everybody's bone-marrow always contained an equal number of pro-erythroblasts or, in pernicious anæmia, promegaloblasts—say 5 billion (10^{12}) altogether—and if the number of fresh reticulocytes which are released at once into the circulation were, say, 50% of the promegaloblasts, then the reticulocyte-count in the peripheral blood, stated as a percentage of the red cells, would depend only on the number of red cells. On the figures postulated above, $2^1/_2$ billion reticulocytes should be related to various numbers of total red cells. This is certainly not the case.

SUMMARY

The maximum reticulocyte response to liver therapy in pernicious anæmia is subject to biological variations, but there is no significant difference in the response when the initial red-cell count is under 1 million or 1·2, 1·4, or 1·6 million per c.mm., so no strict formula can be devised which will forecast the response from the initial red-cell count. To avoid errors in diagnosis or in the assessment of liver extracts it is recommended that the customary average, rather than the maximum, reticulocyte response should be taken as the standard. With an initial red-cell count of below 1·6 million per c.mm. this seems to be about 20–30% with European, and 30–40% with American liver extracts.

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ERYTHEMA MULTIFORME EXUDATIVUM

(THE STEVENS-JOHNSON SYNDROME)

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Von Hebra, in 1860, isolated from other erythemata a malignant type of erythema multiforme characterised by erythemato-vesicular, bullous, or purpuric skin lesions, involvement of orificial membranes, and constitutional disturbances (von Hebra 1866). To this syndrome other clinicians early added bullous lesions in the mouth and oropharynx, ophthalmia ("herpes iris conjunctivæ," Fuchs 1876), and visceral and joint manifestations (Bazin 1862, Quinquaud 1882, Kaposi 1893, von Düring 1896, Osler 1895). Subsequent descriptions of the syndrome have appeared under different names, such as "ectodermose erosive pluriorificialis" (Rendu 1916), "eruptive fever with stomatitis and ophthalmia," ("Stevens-Johnson syndrome," Stevens and Johnson 1922), "dermato-stomatitis," (Baader 1925), and "mucosal respiratory syndrome" (Stanyon and Warner 1945).

Of recent years many cases of this syndrome have been reported, mostly from America but also from Scandinavia (Ustvedt 1948) and from this country (Dowling 1940, Sneddon 1947, Murray 1947, Nellen 1947, Johnstone 1947, Neale 1948). The published reports have been reviewed by Keil (1940), Lever (1944), and Soll (1947).

The following case, typical of erythema multiforme exudativum, is of interest because of the extraordinary severity followed by complete recovery, and the negative results of bacteriological investigations.

CASE-RECORD

A butcher's assistant, aged 27, was admitted to hospital on May 22, 1948. Fifteen days before admission he developed a sore throat with fever and sweating. He stayed in bed for three days, and during that time took 7 g. of sulphadiazine prescribed by his doctor. On the fourth day he returned to work feeling improved. Six days later he developed small "blisters" on the lips, tongue, and mouth, with malaise, frontal headache, and anorexia. During the next twenty-four hours purplish spots developed on the face, forearms, hands, and feet, and spread to the neck, shoulders, and thighs, and some became vesicular. The mouth was then very painful, and two days after the onset of the rash the patient complained of painful swelling of the right elbow. During the day before admission he became increasingly prostrated, with generalised abdominal discomfort, nausea and retching, and difficulty in swallowing. There was a dry cough, and the left knee and ankle became swollen and painful. Micturition was unaffected, and the bowels were slightly loose.

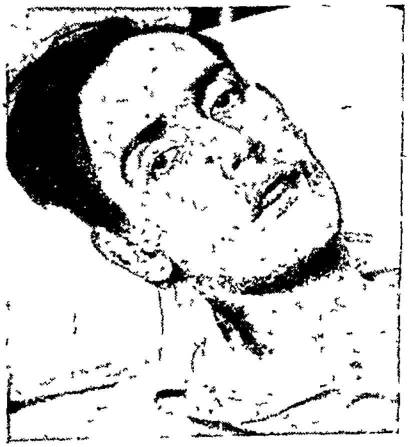

Fig. 1—Distribution of lesions on face.

On the day before admission a small nephew sleeping in the same room was admitted to an infectious diseases hospital with mild scarlatina, and three days later his brother-in-law, also living in the same house, developed a "septic sore throat"; but no bacteriological investigations were made.

Past History.—Apart from measles in infancy there had been no previous illness. By reason of his occupation the patient had been liable to minor sepsis of the hands and fingers, and had had an infection of the right fourth about four weeks previously, which healed in a few without specific treatment.

On examination the patient was a slim pale youn desperately ill and prostrate. Temperature 98·4°F, rate 128, respirations 20 per min. He had well fœtor oris and a recently healed paronychia on th fourth digit. Scattered over his face, neck, shoulder and legs were circular purplish-red circumscribed surrounded by a narrow zone of erythema (figs. 1 They were mainly on the extensor surfaces of the a the flexor surfaces of the legs, and were especially m on the buttocks. The trunk was clear, apart from tw in the right groin and on the scrotum. The vesicle from a few millimetres to more than a centimetre in d the larger ones lying over bony prominences, such elbows, metacarpophalangeal joints, and malleoli were not umbilicated and contained a thin sanguineo On the mucosa of the lips, palate, mouth, and phary numerous cherry-red macules on which were super small vesicles. Many were eroded. The lips were and bleeding, the tongue was coated, and there was a gingivitis. The pharynx and tonsils were injected, tonsillar glands were enlarged and tender. There other lymphadenopathy, and nothing abnormal was f examination of the cardiovascular, respiratory, and

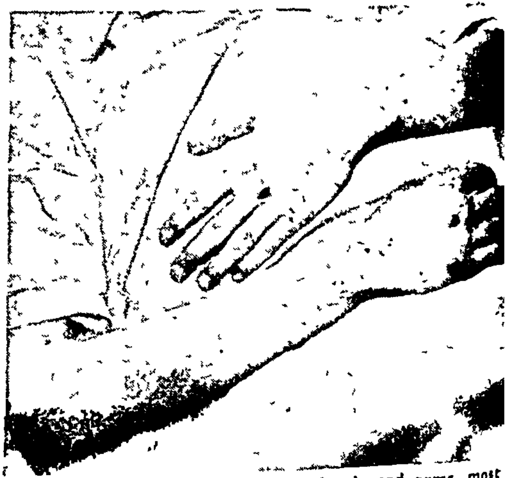

Fig. 2—Hæmorrhagic vesicles on hands and arms, most over joints.

nervous systems. The blood-pressure was 125/95 m The ocular fundi were normal. The abdomen was s the liver and spleen were impalpable. Effusions were in the left knee and ankle joints; and, though there swelling of the right elbow, movements there were r and painful. The other joints were normal.

Investigations.—The urine contained much protein otherwise normal. A blood-count showed red cells 6, per c.mm., Hb 118% (Sahli), white cells 21,000 per (neutrophils 72%, lymphocytes 14%, monocytes The bleeding-time and clotting-time were normal. C fragility was not increased (Hess test negative). Radi of the chest was normal.

Treatment and Progress (fig. 3).—Parenteral penicil given from the day of admission and was contin thirty-five days. Soluble sulphathiazole was also give muscularly from the second day, but was discontinue streptomycin therapy was begun. No new skin appeared, but some of the vesicles became pustular. oropharyngeal lesions became eroded, and small formed on them. Despite dysphagia the patient took by mouth, and these were supplemented by saline s given per rectum. Dysuria was complained of duri first week, but there was no urethral discharge.

May 25.—Streptomycin therapy was begun with a of 0·5 g. four-hourly. The skin lesions were drying, b sloughs were spreading and becoming confluent, and was profuse salivation. The mouth gave rise to consid anxiety in spite of constant attention. Joint ef were unchanged.

May 28.—The patient's condition had deteriorated. temperature was 101°F, with increased prostration

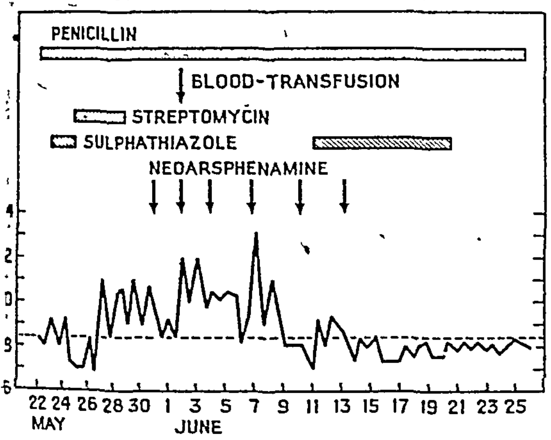

Fig. 3—Temperature chart and treatment.

ius. His mouth and throat now presented an alarming re, since the entire buccal mucosa, palate, and fauces concealed by a thick greyish-white adherent membrane, here was constant oozing of blood from the fissured lips. day this false membrane began to separate, leaving a bleeding surface, and the patient complained of severe ing retrosternal pain on swallowing. The joint effusions resolving. Streptomycin was discontinued, a total of having been given. During the next four days the erature continued elevated and irregular, with a disproonately high pulse-rate. Large sloughs separated from nouth, gums, and pharynx, with slight loss of tissue, and etrosternal pain continued. Large doses of nicotinamide, lavine, and ascorbic acid were administered.

ay 31.—Neoarsphenamine 0·15 g. was given intravenously lternate days. The patient had now developed râles at lung bases and a loose cough with increasing amounts tery sputum. Small amounts of fresh blood and melæna, traces of mucous and necrotic tissue, were passed per m, and his hæmoglobin level had fallen.

ne 2.—A transfusion of fresh blood was given, after h there was no more bleeding per rectum, but at this hæmorrhages and exudates were first noted in both r fundi.

ne 6.—All cutaneous lesions had crusted and fallen off, the condition of the mouth had much improved. The nt was taking solids by mouth but still salivated usly, and the amount of sputum was about 20 oz. daily.

ne 11.—There was definite consolidation of the right r lobe. Separation of sloughs from the mouth was now plete, leaving the oral mucosa friable and hyperæmic. hathiazole was given by mouth in gradually reduced s for the next ten days, by which time the consolidation resolved.

une 13.—The patient was afebrile, in spite of a severe ngitis lasting five days early in convalescence.

uly 22.—He was discharged, the only residua of the ss being deeply pigmented coppery spots at the sites of the larger skin lesions, and loss of the uvula, which had sloughed completely. These pigmented spots were still present when he was seen six months later, and some had central depressions covered by fine scars (fig. 4), but he was otherwise well and free from symptoms.

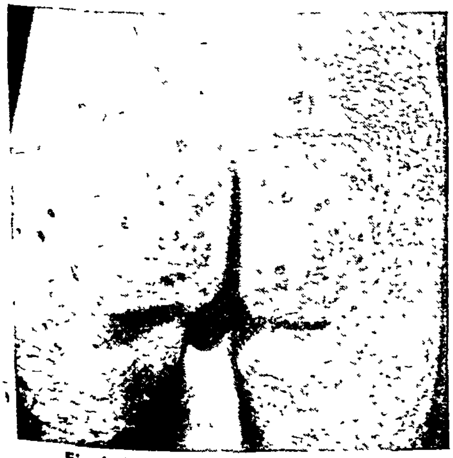

Fig. 4—Residual pigmentation and scars.

Laboratory Investigations.—The highest white-cell count after admission was 21,000 per c.mm. on June 1 (polymorphs 89%, eosinophils 1%, lymphocytes 7%, monocytes 3%); the eosinophils never rose above 2%. The heavy albuminuria noted on admission persisted until the patient was afebrile. Occasional red and white cells were noted a few times. The urine was sterile throughout.

Repeated attempts at culturing organisms from the blood, vesicle fluid, throat, and an excised skin lesion were negative or grew only contaminants. During the stage of pulmonary consolidation *Strep. pneumoniæ* and a penicillin-resistant *Staph. aureus* were found in the sputum. The blood Wassermann and Kahn reactions were negative, as also were serum agglutinations against the typhoid, paratyphoid, abortus, and salmonella groups, and the Paul-Bunnell and Weil-Felix reactions. The Strauss reaction and complement-fixation and conglutination tests for *Pf. mallei* were negative, and injection of vesicle fluid into a guineapig gave negative results. The blood-antistreptolysin titre was 60 units per ml. at the height of the illness.

Virus-neutralisation tests against herpes virus were done on the serum on two occasions: at the middle of the illness and early in convalescence. On both occasions there was a positive titre at 1/16, which was considered not significant.

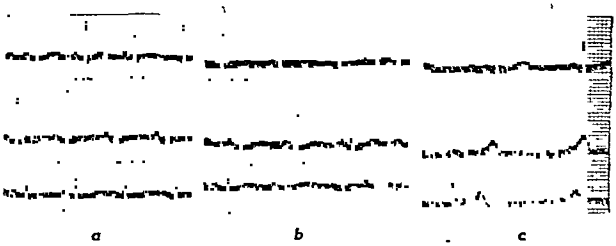

Fig. 5—Electrocardiograms (standard leads): *a*, June 9, 1948; *b*, June 17, 1948; *c*, July 20, 1948.

Histological examination of an excised cutaneous vesicle showed a non-specific inflammation, and no organisms or inclusion-bodies were seen.

Electrocardiograms (fig. 5): on June 9 the T wave was flat in all limb leads and chest leads; on the 17th the T wave was still iso-electric in leads II and III; and on June 30 the T wave was upright in all leads and of normal voltage.

DISCUSSION

To those unfamiliar with it this condition is puzzling and, as in the present case, leads to extensive laboratory investigations to establish a diagnosis. The differential diagnosis is discussed by Fletcher and Harris (1945).

The sudden onset of fever, sore throat, and exudative lesions of the skin and mouth, with progressive involvement of many orificial surfaces, and the extension to viscera, is characteristic of the severe type of erythema multiforme exudativum of Hebra. Of the features presented here the pseudomembranous oropharyngitis was perhaps the most striking. In contrast to the exanthem, it is the most constant feature of this disease, and Schwartz and Brainerd (1946) are of the opinion that the mouth lesion is so characteristic as to be patnognomonic. Though the exanthem varies in its morphology, the severe types of erythema multiforme exudativum are almost invariably associated with a vesiculo-bullous eruption, often hæmorrhagic, of the type seen in the present case, leaving residual pigmentation on healing. Cases with mucosal lesions and constitutional symptoms only and without a rash have been reported (Wentz and Seiple 1947, Grossman 1946). In the present case the eyes were not affected as they so often are (the so-called Stevens-Johnson syndrome), often with disastrous sequelæ. An unusual feature was the electrocardiographic changes suggesting a transient pericarditis (fig. 5). Electrocardiographic abnormalities are rarely reported in erythema multiforme exudativum. Changes of a non-specific nature were noted by Patz (1947) and Edgar and Syverton (1938), but pericarditis has not previously been reported.

The cause of this interesting condition is still obscure. The nature of the disease, with its abrupt febrile onset and self-limiting course, suggests an infection, but attempts to isolate a causal organism are always unsuccessful. The offending organism might be a virus, and known virus infections often accompany or immediately precede the disease; these include herpes simplex (Forman and Whitwell 1934), mumps (Edgar and Syverton 1938, Kove 1945), and primary atypical pneumonia (Stanyon and Warner 1945, Commission on Acute Respiratory Diseases 1946, Finland et al. 1948). Nevertheless, all virus studies and attempts to find a transmissible agent have been uniformly negative.

The possibility that erythema multiforme exudativum is a toxic drug reaction bears consideration, and there are an increasing number of cases in which drugs, and especially the newer chemotherapeutic agents, are incriminated, such as sulphonamides, phenobarbitone, phenolphthalein, 'Diasone,' phenytoin sodium, 'Tridione,' and even penicillin. In only one case has the drug-sensitivity hypothesis been fully substantiated. In Straus's (1948) case a severe attack of erythema multiforme exudativum with a bullous skin-rash, stomatitis, genital lesions, and purulent keratoconjunctivitis developed after the administration of 2 g. of sulphathiazole for chancroid. The patient recovered and, when he was well, sulphonamide sensitivity was tested by a passive transfer test in which 0·05 ml. of serum from a patient undergoing sulphadiazine therapy was injected intradermally. Two days later there was a severe recurrence of the illness exactly similar to the first attack, and the patient again recovered. Shortly afterwards he was given a test dose of 0·4 g. of sulphadiazine by mouth, and two days later he had a third attack of bullous erythema multiforme with ophthalmia and stomatitis as before. There is no doubt that in this case an illness indistinguishable from erythema multiforme exudativum was thrice provoked by sulphonamides.

Attention has recently been directed to the view that this syndrome is a hypersensitivity reaction, occurring in previously sensitised tissues. The sensitising allergens are probably multiple: bacterial, virus, food proteins, and drugs, the drugs acting as haptens and combining with serum-protein to form antigen. If this explanation is correct, erythema multiforme exudativum falls into the anaphylactoid group of diseases which includes the Henoch-Schoenlein group of vascular purpuras and erythema nodosum, with both of which it has features in common.

There are two possible factors in the ætiology of the present case. The patient had a febrile illness with sore throat about a week before the onset of the disease, and two contacts developed streptococcal infections. Treatment was with sulphadiazine, and either this, or the infection for which it was given, may have precipitated the illness. However, sulphonamides were repeated soon after admission and again in full doses later in the illness, without any exacerbation of his condition or recrudescence of the eruption, and can thus be excluded, leaving streptococcal infection as the probable allergen, though the eruption may have been provoked by sulphadiazine in a patient sensitised to a co-existing streptococcal infection (Doxiadis and McLean 1948).

There is no evidence that the antibiotics exhibited had any direct effect on the course of the disease, though they probably contributed to the ultimate recovery by the control of secondary infection.

SUMMARY

A case of severe erythema multiforme exudativum (Hebra) is presented, and the ætiology of the disease is discussed briefly.

In the pathogenesis of this condition an response to bacteria, bacterial products, drugs, and sources of protein probably plays an important

I wish to thank Prof. E. P. Sharpey-Schafer for to publish this case, and Dr. Russell Fraser for help manuscript.

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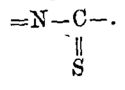
Preliminary Communication

TASTE SENSITIVITY TO PHENYLTHIOU IN GOITRE AND DIABETES

PHENYLTHIOUREA tastes bitter to some people not to others.[1] In European and American popula the distribution of taste thresholds has been found bimodal, about 30% of the individuals tested falling the relatively insensitive (non-taster) class. It is tho that non-tasters are homozygous for a single rece gene.[2] According to Harris and Kalmus,[3] tasters non-tasters with respect to phenylthiourea show same differential taste response to a large numbe other substances containing the grouping:



$$=\mathrm{N}-\underset{\underset{\mathrm{S}}{\|}}{\mathrm{C}}-.$$

Many of these substances are known to be goitrog and some probably occur naturally in common food

In view of these facts it seemed worth whil examine the reactions to phenylthiourea of pati suffering from different forms of thyroid disease. have studied 352 patients with thyroid disorder and controls we have data on 541 normal subjects. In vi of the findings of Terry and Segall[5] that the propor of non-tasters is higher among diabetics we have studied 103 diabetic patients.

The main findings are summarised in the accompany table. The patients with thyroid disorder were classi into two main groups: toxic diffuse goitre (prim thyrotoxicosis), and nodular goitre. In 71% of latter the nodular character of the goitre was by examination of the specimen obtained at operati 61% of the nodular goitres were non-toxic.

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1. Fox, A. L. *Proc. U.S. nat. Acad. Sci.* 1932, 18, 155.
2. Blakeslee, A. F. *Ibid,* p. 120. Snyder, L. H. *Ohi J.* 1932, 32, 436.
3. Harris, H., Kalmus, H. *Nature, Lond.* 1949, 163, 878.
4. Astwood, E. B. *Ann. intern. Med.* 1949, 30, 1087.
5. Terry, M. C., Segall, G. *J. Hered.* 1947, 38, 135.

Group	Total no.	No. and % of non-tasters
rol subjects	541	169 (*31·2%*)
tic patients	103	31 (*30·1%*)
d diffuse goitre	218	67 (*30·7%*)
lar goitre	134	55 (*41·0%*)
Totals	996	322 (*32·3%*)

he taste sensitivity in all the controls, the diabetics, most of the thyroid patients was measured by the hod of Harris and Kalmus.[6] in which exact taste sholds are determined. Some of the thyroid patients) were classified according to their response to a le critical solution of phenylthiourea.

he proportion of non-tasters in the group of patients toxic diffuse goitre and in the group of diabetics es very well with the proportion found in the rols. There is, however, a somewhat higher incidence of non-tasters among the patients with nodular goitre: this is significantly different at the 5% probability level from the proportion found in the controls ($\chi^2=4{\cdot}65$ for one degree of freedom). There was a similar proportion of non-tasters among the cases of toxic and non-toxic nodular goitre.

The data suggest that non-tasters may be somewhat more susceptible to the development of nodular goitre than tasters, though the number of patients it has been possible to examine so far, and the level of significance in the differences observed, are hardly adequate for such a conclusion to be drawn firmly. The object of this note is to stimulate similar inquiries in other centres.

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Harris, H., Kalmus, H. *Ann. Eugen., Lond.* (in the press).

New Inventions

A SET OF CALLIPERS FOR ANATOMICAL MEASUREMENTS

HE callipers described here were designed and structed in the radiotherapy department of the al Northern Hospital, mainly to assist the radio-apist to plan treatment, but they should also be ul in gynæcology, obstetrics, and other branches of licine.

ig. 1 shows two pairs of callipers which are identical, ept in size; the larger pair reads from 0 to 60 cm. the smaller from 0 to 50 cm. Two sizes were structed because it is sometimes necessary to make of the greater depth between the tips and the pivot he larger pair. On the other hand, the smaller pair sometimes easier to manipulate. A scale of centi-res in 0·5 cm. stages is provided on three sides of one to enable a direct reading to be taken in any likely ition. The two arms, which are pivoted at the upper remity and may be locked with a thumbscrew, are nected by a link which slides an indicator along the le as the arms move and thus registers the distance ween the points. The callipers are operated by hold- the handle in the left hand and sliding the indicator h the right hand by the grips provided. As the arms n, the link retreats towards the pivot and allows the l depth of the callipers to be used for the greater measure-nts. The scales are not linear but are openly spaced the lower readings and close gradually towards the her readings. Thus all measurements may be made h about the same degree of accuracy. In other lipers the scale markings are often so small that low les are difficult to read.

ig. 2A shows a pair of callipers intended primarily locating the position of the cervix with reference to e skin surface, or for measurements from the rectum, but it also has other uses. There are two horizontal arms: one straight and fixed, and the other shaped and sliding on a vertical pillar above it. The fixed arm is of polished metal on which is engraved a scale of centimetres in 0·5 cm. stages. A small slide, which can be fixed with a set-screw, indicates the depth of insertion. Since this arm is inserted into the vagina it is made detachable for cleaning and sterilisation after use. The upper arm slides vertically along its supporting pillar, on both sides of which is a scale of centimetres reading from 0 to 23 cm. The instrument is held by the handle, and the fixed arm is inserted into the vagina until the extremity reaches the cervix. The upper arm is then lowered until its point touches the skin, when the vertical distance from the cervix to the skin can be read directly from the scale, which is full size. In a similar instrument, described by Jarvis,[1] the scale is considerably reduced and must therefore be less accurate, and the tip of the moving arm is not vertically above the tip of the straight vaginal rod except in one position.

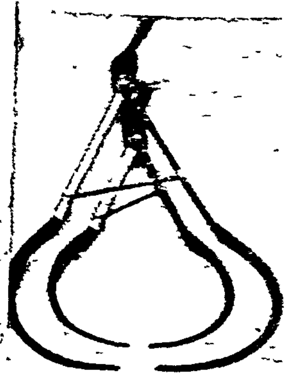

Fig. 1.

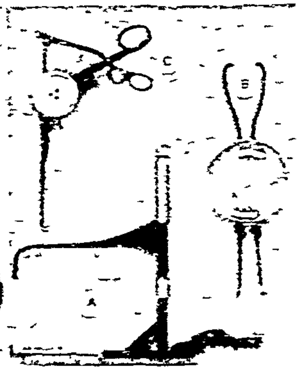

Fig. 2.

Fig. 2B shows a combination of inside and outside callipers designed for making transverse measurements in the mouth, though it has other purposes. This instrument is intended for smaller measurements than the three previous models, so the scale on the central dial gives a magnified reading (1·7/1 cm.). The range is 0–20 cm. for the outside callipers and 1·5–20 cm. for the inside callipers. The dial is rotated by a fine chain drive anchored to the two limbs of the callipers and passing round a central pulley. A spring-loaded pulley keeps the chain taut in all positions of the arms. The dial and mechanism are enclosed in a transparent case. The instrument can be operated with one hand.

Fig. 2C shows an instrument for making anterior-posterior measurements in the mouth. The callipers consist of two parallel members, one fixed and the other moving. The extremities have small extensions at right angles to the arms so that the operator can easily observe the position of the tips. The moving member slides along the underside of the fixed one and is operated by a scissors motion. A rack cut in the sliding member works a gear-wheel which rotates a dial bearing, on both sides, a scale with a magnified reading (2/1 cm.), the range being 0–10 cm. The scissors grip allows the instrument to be operated with one hand.

This set of instruments can be used to take all the body measurements for which callipers are normally required, and in each case the ease with which the scales can be read while in position on the patient has been the first consideration.

All the legs of the callipers except the vaginal rod shown in fig. 2A are made of 'Tufnol,' which is light and strong and can be sterilised in 'Dettol' without harm.

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Reviews of Books

Modern Practice in Ophthalmology

H. B. STALLARD, M.B.E., M.A., M.D., F.R.C.S., surgeon, Moorfields, Westminster and Central Eye Hospital; eye surgeon, St. Bartholomew's Hospital, London. London: Butterworth. 1949. Pp. 525. 65*s*.

THIS is the work of 14 different authors, giving their views on modern ophthalmic practice for the information of the general practitioner. The routine groundwork has been well covered and the information is standard ophthalmic teaching. It seems doubtful how much the family doctor will want to know of optics and the theory of refraction, and a good deal of this section might have been omitted in favour of a longer discussion on contact lenses and an exact summing up, based on some hundreds of cases, of the extent to which patients who have bought these lenses have subsequently worn them.

Dr. S. P. Meadows's section on medical ophthalmology is outstanding for its lucidity and learning, while Mr. John Foster on methods of examination, and the editor himself on surgical topics, make excellent reading. In a new edition Mr. Bruce Hamilton might make it clear what anæsthetic he uses for probing the lacrimal passages in the adult; at present the reader is left to presume that cocaine drops are used, and these would certainly be inadequate. The writer on retinal detachment should warn the practitioner that his duty towards a patient with suspected or diagnosed retinal detachment is to send him to bed until a specialist's advice can be obtained. There are many good colour illustrations, but also some which are old and should be improved. The book contains a great deal of useful information and presents modern ophthalmology from many different aspects.

The New York Academy of Medicine

Its First Hundred Years. PHILIP VAN INGEN, M.D. New York: Columbia University Press. 1949. Pp. 543. 55*s*.

EVEN though, as Dr. Van Ingen explains, he was equipped with "a two-machine Soundscriber," which enabled him to dictate while the previous day's dictation was being typed, the task of compiling this history from at least 12,000 pages of minutes of meetings of the academy and of its committees—in the early years often in almost illegible handwriting—proved formidable. The result of his labours cannot fail to be interesting; yet in a way it is also disappointing. His book is not so much a history of the academy as a vast collection of material from which such a history might be written. To adhere to a strictly chronological sequence, from session to session and from president to president, makes for a disconnected story. For each session the list of appointments to office, of resignations, and of deaths must be given, the financial position and the work of the various committees reviewed, scientific communications appraised, new ventures and developments described, disputes and accusations put on record. A considered and continuous account of the steady rise in ethical standards would have been fascinating, for the academy was founded in an America which had not yet shed its roughness and rawness. The fellows first appointed seem to have regarded it mainly as an association likely to strengthen their hands in the bitter struggle for daily bread against charlatans of all sorts. Its committee on admissions seems never to have asked itself "Is there any reason why this man should be elected?" but always "Is there any reason why he should not be elected?" Collection of dues—the tax, as it was called—was a matter of great difficulty, and so many were in arrears that a professional collector had to be employed. Charges of advertising or of fee-splitting were brought even against men who were prominent in the affairs of the academy. As late as 1879 the president, Dr. Barker, was accused of falsely claiming to be a graduate of medicine of Paris, thus rendering himself liable to prosecution for perjury. The president's defence was that he had lost the diploma; but he called friends to witness that it had once been in his possession, and the committee of ethics unanimously voted that the charge was unsustained—even though the Faculty of Medicine of Paris stated that his name was not on their lists.

The change from all these unhappy beginnings to high position, secure and honoured, which the now holds is the fascinating theme of this book, though it is by the simultaneous consideration of aspects of development.

Diagnostic Tests for Infants and Children

H. BEHRENDT, M.D. New York and London: Publishers. 1949. Pp. 529. 57*s*.

Dr. Behrendt is to be congratulated on his industry in bringing together in one volume the for diagnosis of disease in infancy and childhood. book should interest the clinician who is anxious to his clinical findings by biochemical tests and to the way in which the various morbid processe produced. The material is comprehensive anc arranged and each test is dealt with under subhe —such as pædiatric considerations, procedure interpretation. In some sections the pædiatri siderations are very brief and might well be in in the interpretations, which are well done an the reader a good idea of the value of the tes the significance of departures from normal. The are described in detail; in some instances (in te the estimation of inorganic phosphorus for more than one method is given, but Dr. Behrend not state his own preferences. Besides tests f diagnosis of digestive, renal, hepatic, and en functions, there are chapters (some written by authors) on the inorganic constituents of the and on the tests used in the study of vitamin nu immunology, psychology, hearing, and sight. simple side-room tests are omitted. There is a v list of references at the end of each chapter, and th will be a useful addition to every pædiatric re library.

Year Book of Medicine, 1949 (Chicago: Y Publishers. London: H. K. Lewis. 1949. Pp. 831. 31s The editors, led by Dr. Paul B. Beeson, this year cove advances in the medical care of infections, the ch blood and blood-forming organs, and the kidney, th and blood-vessels, and the digestive system. The and value of volumes in this series are well known, one carries on a sound tradition.

May and Worth's Diseases of the Eye (London: Baillière, Tindall, and Cox. 1949. Pp. 548. —Ever since May and Worth first appeared in 190 been intended as a textbook for students and genera tioners. This aim has been maintained by Mr. Mon Hine, F.R.C.S., in producing the new edition, and he his job admirably. In a volume of handy size and ea type both student and practitioner will find the a any question in ophthalmic practice with which th be confronted; indeed as value for money it is har how this little volume could be bettered. It does no that some of the ophthalmic operations described h somewhat superseded, for the reader of this book will know nothing but the bare outlines of such procedu figures are good, though no. 100 shows a lacrima pointing in a strange direction if it is to pass d nasolacrimal duct.

Illustrations of Surgical Treatment, Instr and Appliances (3rd ed. Edinburgh: E. & S. Livi 1949. Pp. 391. 25s.).—After a short chapter on int infusion, Mr. Eric L. Farquharson, F.R.C.S., introd main feature of this book—ingenious methods of fractures, well illustrated. Recent methods have be porated, and the whole section is most comprehen useful. No less than 120 pages of illustrations of instruments follow. These may be of value to exa candidates (if they are still expected to name the instruments) but are of little use to the practical ma with fractures along the lines given in the main pa book. The main chapters are so delightful that mo would willingly sacrifice these illustrations in fa more text.

Messrs. H. K. Lewis are the English publi *Blakiston's New Gould Medical Dictionary* (see *Lancet*, p. 702.). The price is 45*s*. on ordinary paper and 55s. paper.

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THE LANCET

LONDON: SATURDAY, DEC. 3, 1949

Treatment of Pernicious Anæmia

IE general practitioner may well be confused by chopping and changing of opinion on the treat- t of pernicious anæmia. A bewildering array of arations faces him, many with names that bear relation to their use and give no indication of nature; and, to make things worse, he may on his desk literature from a pharmaceutical pressing the advantages of a preparation that he condemned in editorial columns.

hy do names for liver and similar preparations ernicious anæmia vary so aggravatingly? There is no sense in it. Insulin is always labelled sulin," followed by the brand or registered name s manufacturer, and carries a clear indication of strength of the contained solution: but liver acts are given such names as Campolon, Pare- ps, Plexan, Examen, Anahæmin, and Pernæmon e—names that in no way suggest that the first e are dilute whole-liver extracts; whereas the three are concentrated or highly refined. There exist one American brand which is informa- ly labelled: "X brand solution of liver extract. *.S.P.* units per c.c." In the U.S.A., moreover, rent liver extracts are available in strengths ing from about 3 to 15 *U.S.P.* units per ml.: the of the 15-unit solution needed for inducing ission in a relapsed case of pernicious anæmia is it 2 ml., and about 1 ml. fortnightly is enough maintenance. This seems simple enough, but rtunately these convincing-looking "units" are e arbitrary and their only value is to indicate the tion. If firm A makes one solution of 5 *U.S.P.* s per ml., and one of 15 units per ml., it is a onable assumption that if 6 ml. of the former s a good response, 2 ml. of the latter will do as l; but it certainly cannot be assumed that liver tact of 15 units per ml. made by firm B will duce an equally good response with a dose of d.—you have to try and see. The reasons for the ence of an internationally, or even nationally, ted unit of liver-extract activity have often been ussed, and the main one is that as test object no l substitute has yet been found for the pernicious- mia patient in relapse. Estimation of the content olic acid and of vitamin B_{12} has proved unreliable. l no other method, chemical or biological, has so stood up to proper tests. If such a test is found, will be a great help.

Meanwhile six groups of preparation * are offered the doctor:

A. *Liver extracts for intramuscular injection.*—These e relatively inexpensive: the dose for the patient in apse is 12–20 ml., and 2–6 ml. weekly suffices for aintenance. Examples: Campolon (Bayer), Hepastab oots), Hepolon (Allen & Hanburys), Parenamps (Paines d Byrne), Plexan (Glaxo).

B. *Concentrated or refined liver extracts for intramuscular injection.*—These are relatively expensive, but have the great advantage of small-volume doses: 4–6 ml. for the relapsed case, and 0·5–1·0 ml. weekly for maintenance. Examples: Anahæmin (B.D.H.), Examen (Glaxo), Hepastab Forte (Boots), Pernæmon Forte (Organon).

C. "*Proteolysed*" *liver preparations for oral use.*—These represent the most expensive way of treating pernicious anæmia (except for vitamin B_{12}), but they are useful for patients who dislike injections and cannot cope with preparations of group D. They are mostly used for maintenance, and DAVIDSON [1] thinks that they may be specially useful in those cases that are relatively resistant to treatment. The dose is $^1/_3$–1 oz. daily. Examples: Proteolysed liver *B.P.C.*, Hepamino (Evans), Proteolysed Liver (Paines and Byrne). The *B.P.* "Liquid extract of liver" is not a proteolysed preparation and is little used because it is unpleasant to take and has no special advantages.

D. *Desiccated-stomach preparations for oral use.*—These are somewhat expensive, but by some authorities (notably WILKINSON [2]) they have been particularly recommended for maintenance treatment of patients with neurological complications, and they have the advantage of providing a little addition to the protein ration. Dose $^1/_4$–1 oz. daily. Examples: Desiccated-stomach *B.P.C.*, Extomac (Bengers), Pepsac (Boots).

E. *Pure vitamin-B_{12} solution.*—This is the last-comer, and at the moment is very expensive. Vitamin B_{12} will definitely treat pernicious anæmia in relapse—but no better than the preparations in groups A and B. We are not yet certain about its value for maintenance.[3] It has, as yet, no place in the routine treatment of pernicious anæmia: but it may have, a year hence. Examples: Anacobin (B.D.H.), Cobione (Merck).

F. *Folic-acid preparations.*—These should *not* be used for the treatment of pernicious anæmia. The reason, which we have noticed before,[4] is that folic acid will not treat the neurological complications and may even accelerate their appearance; patients who have initially no disease of the central nervous system may develop it if kept on folic acid for long; a recent estimate [5] puts the risk at 80%. Administration of folic acid is the correct treatment for some megaloblastic anæmias—notably sprue—but not for pernicious anæmia. Examples: Folvite (Lederle), Plastules with Folic Acid (Wyeth).

The reason why folic acid is still used is, presumably, its convenience. When practitioners have little time they naturally prefer to prescribe a pill or capsule rather than give an intramuscular injection, and their patients also prefer it. But if the doctor cannot organise the time-consuming injections of groups A and B, he can use the preparations of groups C and D.

The position is then, that despite much agitation and promise of later advances, the treatment of pernicious anæmia, today, still rests on the proper use of liver and desiccated-stomach preparations.

Diagnosis and Treatment of Actinomycosis

THE striking success of the sulphonamides and antibiotics in actinomycosis has stimulated a new interest in this disease. WEED and his colleagues [6] at the Mayo Clinic, who have made a careful study of necropsy material and of current suspected cases, urge the importance of basing the diagnosis on a thorough bacteriological examination, which, when possible, should include identification of the causative actinomycete in culture. In their view errors are common when the diagnosis is based on clinical findings alone. Moreover, identification of the infecting species will guide the clinician in his choice of treatment.

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* American liver extracts are not mentioned, because their importation into the United Kingdom is not at present allowed.

1. Davis, L. J., Davidson, L. S. P. *Quart. J. Med.* 1944, 13, 53.
2. Wilkinson, J. F. *Lancet*, 1949, i, 291, 336.
3. Editorial, *Ibid*, Sept. 24, p. 565.
4. Editorial, *Ibid*, 1948, i, 371.
5. Israëls, M. C. G., Wilkinson, J. F. *Brit. med. J.* Nov. 12, p. 1072.
6. Weed, L. A., Baggenstoss, A. H., Baugher, L. *Proc. Mayo Clin.* 1949, 24, 463.

About 90% of all cases of actinomycosis are caused by the anaerobic species *Actinomyces israeli* (syn. *A. bovis*), which, as LORD [7] showed in 1910 and many mycologists have since confirmed, is often present as a commensal in the healthy mouth, vegetating especially in tonsillar crypts, under the gum margins, and on carious teeth. In artificial culture the species is anaerobic or micro-aerophilic, of delicate habit, and incapable of producing spores or any resistant form. For this reason it cannot survive on natural substrata outside the animal body; so infection does not occur from external sources but is always "autogenous." The principal sites of the primary disease are the cervicofacial region, usually infected by direct extension from the mouth; the lungs, by aspiration infection; and the cæcal or appendicular region. Bacteriological examination is often necessary to establish the diagnosis of actinomycosis, but it is not always free from errors in interpretation, for the presence of actinomyces filaments or even "grains" in the sputum of a patient with a chronic pulmonary disorder does not necessarily indicate that the disease is pulmonary actinomycosis; the organism may have been vegetating in the mouth or even saprophytically in a bronchiectatic cavity. Last year KAY [8] isolated *A. israeli* from the sputum of 109 out of 240 hospital patients with chronic bronchopulmonary disorders, and from 65 of the 109 it was also isolated by bronchoscopic swabbing. Bronchiectasis with varying degrees of pneumonitis was present in 37 of the 65, in 8 others there was moderately severe chronic bronchitis, and the remaining 20 had aspiration pneumonia, lung abscess, or more extensive pulmonary suppuration. *A. israeli* is not uncommonly present, with other organisms, as a saprophyte in bronchiectatic and other chronic lung cavities, but it may play a more pathogenic rôle in some cases of chronic bronchitis, aspiration pneumonia, or local abscess, and these foci, from which more extensive disease may develop, should, when identified, be given prompt treatment. Material obtained by bronchoscopy, from draining sinuses, or from lung resection is far more satisfactory for diagnosis than sputum. SCHAIN and co-workers [9] isolated *A. israeli* from the bone-marrow and occasionally from the blood, cerebrospinal fluid, or liver tissue of four cases of Hodgkin's disease and three other conditions. None of the seven patients was suffering from actinomycosis, nor was *A. israeli* the cause of their clinical condition. In 8500 other specimens from various sources, including 1000 blood samples, they could not find this organism. It seems that, in the seven cases where it was found, *A. israeli*, probably from the mouth, had become a harmless parasite in the hyperplastic reticulo-endothelial tissue.

Aerobic actinomycetes belonging to the genus Nocardia are responsible for the remaining 10% of cases of actinomycosis, and the most important of these are the systemic infections, chiefly pulmonary, caused by the partly acid-fast *Nocardia asteroides* group. BENBOW and colleagues [10] referred to pulmonary and 2 peritoneal infections by this all of which were fatal, and KIRBY and MCNAU mentioned 32 cases, of which 28, all pulmonary tions, were fatal. Clinically, the pulmonary may resemble tuberculosis, but careful bacteriol examination, including inoculation into guinea should exclude tuberculous infection. *N. aste* is not sufficiently acid-fast to be detected by ordinary Ziehl-Neelsen staining method, but easily stained by Gram's method and is not diffic cultivate from morbid material.

The older forms of treatment of actinomycosis iodides, iodine, or thymol have been supersede the sulphonamides, penicillin, and streptomyci of which have been effective in particular cases general, *A. israeli* infections yield, at least tempor to treatment with the sulphonamides, of whic most useful seem to be sulphadiazine and 'Su triad'; but sulphonamide treatment must be prolo in some cases even for two years, to insure ag recurrence, for the early dramatic improvem often misleading. Penicillin is probably the effective agent in actinomycosis caused by *A. isr* but the initial dosage must be large enough to pr the development of penicillin-resistance in the par Streptomycin was used with apparent succes TORRENS and WOOD [13] and by PEMBERTON HUNTER,[14] in four cases of *A. israeli* infection, of which had previously been treated unsucces with sulphonamides and penicillin. There have few published reports on the treatment of *N. aste* infections with antibacterial drugs, but BE and colleagues,[10] among others, have found sulphonamides effective, and the Mayo Clinic wor point out that *N. asteroides* is sensitive to the sul amides but not to penicillin. In Paris, D'ESHOU and ZAFFRAN [15] report a case of pulmonary ac mycosis (*N. asteroides*) which recovered on strept cin after massive doses of penicillin had failed. writers emphasise the importance of surgical vention, when feasible, especially for the draina pus, without which chemotherapy may fail. R therapy, accessory chemotherapy, and the ge management of symptoms are important secon measures.

Does It Work?

IN 1947, at the request of the National Found for Infantile Paralysis, the therapeutic trials mittee of the American Medical Association fo a special subcommittee to investigate the val moist heat in poliomyelitis. In a preliminary rep this subcommittee has set out the principles t followed by those who undertake to test any therapeutic agent in poliomyelitis. The r illustrates how extraordinarily difficult and expe it may be to assess the value of treatment in

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7. Lord, F. T. *J. Amer. med. Ass.* 1910, 55, 1261.
8. Kay, E. B. *Amer. Rev. Tuberc.* 1948, 57, 322.
9. Schain, P., De Stefano, B. A., Kazlowski, B. S. *J. Lab. clin. Med.* 1949, 34, 677.
10. Benbow, E. P. jun., Smith, D. T., Grimson, K. S *Ame Tuberc.* 1944, 49, 395.
11. Kirby, W. M. M., McNaught, J. B. *Arch. intern. Med* 78, 578.
12. Walker, J. M., Hamilton, J. W. *Ann. Surg.* 1945, 12 Hamilton, A. J. C., Kirkpatrick, H. J. R. *Brit. med J.* ii, 728. Arden, F. *Med. J. Aust.* 1945, i, 540.
13. Torrens, J. A., Wood, M. W. W. *Lancet*, 1949, i, 1091.
14. Pemberton, H. S., Hunter, W. R. *Ibid*, p. 1094.
15. d'Eshougues, J. R., Zaffran, A. *Bull. Soc. Méd. Hôp.* 1949, 65, 935.
16. Council on Pharmacy and Chemistry, American Association. *J. Amer. med. Ass.* 1949, 140, 534.

ase which. like poliomyelitis. has a complex ology, a variable course. and an uncertain termi- on. In planning clinical trials of a poliomyelitis edy many variables must be taken into account des the unpredictable course and outcome of the ase. These include differences in diagnostic criteria possible differences in the effects of various types he causative virus; the results of climate and graphical situation; the age-distribution of the ents; and the techniques used to measure the nt of paralysis, deformity, and disability caused he disease. To control these variables adequately subcommittee believes that at least 750. and erably 1500. poliomyelitis patients should be er observation for at least two years. This means the trial must be conducted on a regional or onal scale and that a large number of hospitals t collaborate in it. A hospital participating t agree to accept cases strictly in accordance predetermined diagnostic criteria, to classify n carefully according to the stage of the disease admission, to assign them to control and test ps in a completely random manner, to give tical physical and other treatment—apart from treatment to be studied—to each group, and to nge for the collection by experts of data on the ress and outcome of each case in a form which be analysed statistically.

hree main diagnostic criteria are suggested: acute onset of a febrile illness with headache. r, and a recognisable stiff neck. the fever in general to exceed 104°F and not to persist longer than days unless there are obvious complications to unt for it or bulbar palsy has developed: (2) if alysis is absent there should be, besides fever, a ed protein content and a cell-count of 50–100 c.mm. in the spinal fluid; and (3) the paralysis ent during the febrile period should be localised demonstrable—i.e., not merely a generalised scular weakness. With these criteria, and excluding ients seen later than 28 days from onset (the inning of fever), the patients should be classified three categories: (1) preparalytic cases seen ing the febrile illness: (2) paralytic cases seen ing the febrile state up to 7 days after onset; and paralytic cases seen 8–28 days from onset. For random assignment of patients to test and control ps the subcommittee has adapted a method ginally used in a British Empire Cancer Campaign estigation; this ensures that in every 20 consecu- e admissions 10 patients will be assigned to the group and 10 to the controls, and that one p can never exceed the other by more than patients. It is neither justifiable nor practicable. the subcommittee's view, to withold all treatment m controls. A basic treatment carefully designed avoid the use of any agent which would confuse augment the action of the treatment under trial st therefore be decided on and rigidly applied to test patients as well as controls. For the collection data on progress and outcome which can be mitted to statistical analysis, the subcommittee commends that every patient in the trial should examined and assessed by a team of experts who e prepared to make frequent visits to each hospital king part in the trial. This team should, they nsider, include an orthopædic surgeon, a specialist in physical medicine. a pædiatrician, and a neurologist. All its members should be clinically independent of the trial and familiar with the results of orthodox treatment. without, however, having any fixed ideas on or preferences for any particular form of therapy. They should not know at the time of examination whether a particular patient has been in the test or control group. The final interpretation of the data should be the joint work of the hospital clinicians. the team of experts. and a statistician.

Reports, all too frequent in the past, of "encouraging" results with a new treatment were often based on the hasty assessment of half a dozen patients and sometimes contributed more to "medical myth and mumpsimus" than to the science of medicine. The way of the assessor in a therapeutic trial is indeed hard and in most respects not immediately rewarding. Statisticians are never satisfied with small numbers and demand from those who undertake to collect data for them an impersonal attitude to patients and a mechanical kind of work which many doctors find insupportable over long periods. Yet the carefully controlled large-scale trial of a therapeutic innovation, tedious and expensive though it may be, seems the only satisfactory way of answering the question "Does it work?" In the long run the cost of such trials is probably more than offset by the saving they effect by preventing or ending the use of expensive treatments when something cheaper would be just as good.

Annotations.

HOSPITAL FINANCE

THE drawbacks in the present method of financing the hospital service, to which we drew attention last summer,[1] have lately been reviewed, from a regional angle, by the North West Metropolitan hospital board; and representations are being made to the Ministry along the lines of a report by the regional treasurer. This suggests that the existing methods of approving estimates submitted by management committees lead to: (1) overstatement of requirements, because each committee tends to provide for unforeseen contingencies: and (2) guidance or direction from the Ministry on matters of detail. Furthermore the time-table for submission of estimates, which is dictated by the Parliamentary time-table, gives regional boards insufficient time to examine the estimates as closely as they should; and indeed "these committees have not sufficient data on the current rate of spending to be of use to them in preparing their estimates for the board," and they have to proceed with these estimates at the same time as the previous year's accounts are being closed.

The suggested remedy is that management committees should submit forecasts of expenditure to the board, which would review these "on a broad basis" and pass them to the Ministry of Health in time for the Ministry to decide on the sum to be included in its estimate. Detailed estimates could then be prepared by management committees for submission to the board by, say, the middle of November, and the board would be allowed three months for their examination. This, says the report, would give time for any major alteration in the total requirements of the Ministry of Health for the hospital service to be adjusted in the Civil Estimates.

> "After Parliament has approved the estimates the amount allocated for the hospital service could be allocated by the Ministry over the regional boards and boards of governors, leaving the regional boards freedom in the utilising of their

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[1] Leading article, *Lancet*, July 9, p. 61.

allocations in the best interests of their areas. Boards should also be allowed to provide in their estimates a contingency item to meet supplemental estimates which must occur in this service. Balances should be retained in the accounts of regional boards and would require review at the time of each budget. It may be argued that this is contrary to Governmental accountancy practice, but it should be remembered that the keeping of accounts by hospital authorities on an income and expenditure basis is also contrary to the practice in national finance."

Financial policy, it is admitted, should undoubtedly be a matter for the Ministry, but the need for instructions on detail is not apparent. "Regional freedom in finance within the limits of a broad Ministerial policy would obviate the need for the issue of instructions on comparatively minor matters."

In the field of capital finance the existing policy of allocating to regions an annual sum of which any part remaining unexpended at the end of the financial year is lost, encourages spending on works having a comparatively low priority; the boards should be allowed to carry forward unexpended capital allocations, and in this way essential major work could be undertaken with the knowledge that the necessary money will be there.

At the same meeting the board agreed to an interim scale of charges to medical and dental staff for board and lodging. This scale has been commended to management committees with a view to securing uniformity throughout the region; and later all four Metropolitan regions will try to agree on a uniform scale. Such a course would go far towards meeting the complaints of registrars who have found that between neighbouring hospitals the charges vary widely.[2]

PROGNOSIS IN CEREBRAL HÆMORRHAGE

WHEN a patient is examined shortly after a stroke it is usually difficult to assess either the immediate prognosis or the risk of further vascular accidents. Tennant and Harman[3] have tried to analyse factors which may influence the prognosis by studying 107 patients with cerebral vascular accidents admitted to the Wisconsin General Hospital. There were 5 cases of cerebral embolism, which are not considered further, 27 of cerebral thrombosis, and 75 of hæmorrhage. In the differential diagnosis of thrombosis and hæmorrhage the criteria suggested by Aring and Merritt[4] from a study of 245 fatal cases have been used, and though these are certainly not infallible they are a useful guide in differentiating the two conditions. The proportion of 75 cases of hæmorrhage to 27 of thrombosis is unusually high, probably because only the more serious cases were sent to hospital—22 of the 75 patients with hæmorrhage died but only 2 of the 27 with thrombosis.

Hæmorrhages from congenital aneurysms were excluded from the series, and only 12 of the patients considered had a hæmorrhage before the age of 40, the greatest number occurring during the sixth decade. The chance of a hæmorrhage proving fatal appeared to be greater if it occurred before 40 or after 60. In general, if the systolic blood-pressure was above 190 mm. and the diastolic above 140 mm. Hg, the risk of death seemed to be increased. The depth of coma did not appear to bear much relation to the outcome of the attack but the duration of coma was of considerable importance; none of the patients who recovered were in coma for longer than two hours, while in the 22 fatal cases coma always lasted for several hours. Another prognostic sign was the occurrence of abnormal respiratory rhythm, particularly Cheyne-Stokes respiration. All except 6 of the fatal cases had long periods of altered respiration, while only transitory abnormalities occurred in the patients who recovered. The series was scarcely large enough for estimation of the eventual outcome in patients survived the initial attack, but 10 had a second hæmorrhage, 4 a third, and 1 a fourth. The mo second attacks corresponded to that of the first.

Rose[5] studied the problem from a different ang estimating the time between the onset of an attack death in a series of 205 cases dying of cerebral h of Leeds General Infirmary. His series included 30 in hæmorrhage from intracranial aneurysms and no than 27 cases of apparent cerebral thrombosis in secondary hæmorrhage occurred about a week after initial attack, probably the result of alteration in nutrition of an arterial wall in relation to the ar softening; this group is of particular importance the use of anticoagulants is considered in the a cerebral thrombosis. No patient in this series wit primary hæmorrhage into the cerebral survived for longer than four days.

RALLY OF REGISTRARS

THE inaugural meeting of the registrars' group of British Medical Association was held in London Saturday, Nov. 26. Some months ago registrars up down the country, persuaded that in their difficult they must help themselves, began to band th together into regional groups; and from these lo bodies emerged a national committee which convinc the council of the B.M.A. that recognition should not withheld. Hitherto registrars from teaching hospita have tended to hold themselves apart from the movement; and at last Saturday's meeting the acrimonio debate on constitution, which occupied more th half the day, suggested that some now regret havi allowed their non-teaching colleagues to gain unquestion ascendancy. When the meeting turned to pol dissidence vanished; and the day ended with handso tributes to the antecedent organisation which, thou lacking any powerful backing, had already achiev notable results.

The new group is to press for representation on th various medical advisory committees; for the filling hospital establishments with the least possible dela and an assurance that no registrars in established pos will be dismissed until these establishments are defined for an undertaking that fully trained registrars unde notice of dismissal shall not be lost to the service unt establishments are known, and that at least two month notice of dismissal will be given; and for investigatio of methods of filtering off surplus registrars. A Ma chester delegate believed that only 1 in 5 of seni registrars would get a consultant post, and urged th the position of registrars should be clarified; for a present they had no idea what to do. He was alarme by the paucity of vacancies "with reasonable prospects in general practice, and reasoned that in any event man who had been doing specialist work for three four years would need reablement to fit him for gene practice. The meeting viewed with alarm the apparent uncontrolled growth in the number of registrar posts, an agreed that the establishment of consultants must b known before the desirable number of registrars coul be determined. Before the war, it was pointed out registrar appointments were largely confined to teachin hospitals. Now, however, such appointments had bee made to small and ill-equipped hospitals with no faciliti for training, while in the larger non-teaching hospital a consultant with 200 beds might have as many as nin registrars. Should there not, it was asked, be a exchange of registrars between the teaching and the non-teaching hospitals; for surely, now was the time to end the division between the two groups by aiming at a uniformly high standard. At present registrars were commonly doing the work of consultants; and aermore the fitness of some consultants to have strars was open to question.

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[2] Leading article, *Ibid.* Nov. 19, p. 949.
[3] Tennant, E. C., Harman, J. W. *Amer. J. med. Sci.* 1949, 218, 361.
[4] Aring, C. D., Merritt, H. H. *Arch. intern. Med.* 1935, 56, 435.
[5] Rose, W. McI. *Lancet*, 1948, ii, 561.

he meeting also called for a clear expression of the ria for appointment to the various grades of registrar s. Quite junior posts were now being reserved for with higher qualifications and long experience who ld really be senior registrars or even consultants; this made the position of the young man in training difficult. The feeling seemed to be that appointts should be made by the regional board; but a ible modification suggested was that, while the strar should be in contract with the board, the ultant concerned should appoint him.

he insecurity of the registrar's tenure also engaged meeting's attention. Not only were many now er the shadow of dismissal at short notice but new ointments were being made for short terms; and an ance was cited where a senior registrar's post with ssured tenure of only six months had been advertised. speaker argued that registrars were all civil servants; he knew no other groups of civil servants approachmiddle life who were equally insecure.

he discussion of policy was notable for the restraint which registrars explained the grave straits in which y of them are placed. Flowing through the dission was the thought embodied in the first of the p's long-term aims—"that all registrar posts be gnised for training purposes for specialisation." he group can gain this end, it will have benefited not those it represents but the whole service.

PENICILLIN IN PERITONITIS

NE of the remarkable features of penicillin is that as maintained and in many respects even surpassed early promise. This is very different from the usual erience with a new drug or treatment which wins a h reputation at the outset. Moreover, penicillin's l of application is still widening. The early experintal work suggested that no benefit could be expected n penicillin in peritonitis of intestinal origin or ctions of the urinary tract because the infecting anisms were not susceptible, but later clinical reports[1] e shown that penicillin may after all play a useful t in the control of infection in prostatic surgery, there is experimental evidence that penicillin is ctive in peritonitis originating in the appendix.

othenberg and his fellow workers[2] conducted a ies of controlled experiments on dogs to compare effect of sulphonamides, streptomycin, and penicillin, administered in various ways, on the course and come of peritonitis produced by dividing the bloodsels of the appendix, ligaturing its base, and then shing it. All the control animals died, the average iod of survival being 39 hours. The commonest ecting organisms were *Bact. coli*, clostridia, *Strep. alis*, and *Staph. albus*, in that order of frequency. e first groups of treated animals were given sulphonides intravenously, intraperitoneally, or by both tes combined. Not one dog's life was saved by these gs, though the period of survival was doubled when combined route was used. Streptomycin given ramuscularly saved the life of one out of fifteen dogs, e survival period of the remainder being about the me as in the sulphonamide group. Ten dogs received eptomycin intraperitoneally and none of them was ved. In six of these dogs as much as 4 g. of streptoycin was instilled at a time and they all died within minutes of the first or second instillation, from resratory failure due to the toxic effect of the drug, the lood-level of which rose to 160 units per ml. Penicillin lone was effective. Given intramuscularly in large doses alf a million units daily for 6 days) it saved four out of five dogs, and the fifth survived for a week before dying of fulminating peritonitis reactivated by exploratory laparotomy. Smaller doses of ordinary commercial penicillin were a good deal less effective, but 100,000 units daily of penicillin containing 15–25% of penicillin X saved nine out of ten dogs. Given intraperitoneally even penicillin X was of little use.

These encouraging experimental results support a current clinical impression that penicillin is improving the outlook in peritonitis of appendiceal origin, but they are not easy to explain on the basis of bacteriology. In vitro penicillin is not usually potent against *Bact. coli* and *Strep. fæcalis*, for instance, two of the principal agents in enterogenic peritonitis, whereas *Bact. coli* is susceptible to streptomycin. Yet in these experiments penicillin succeeded and streptomycin failed. On the other hand, lately Yeager and his fellow workers[3] have reported that streptomycin increases the survival-rate in experimental appendiceal peritonitis in dogs from 20 to 60%, though they gave a smaller dose and started it later than Rothenberg et al. They also tried 'Aureomycin' and found it still more effective.

THE SCHOOL HEALTH SERVICE

SCHOOL medical inspection began with the Education Act of 1907, since when the scope of the school medical service has steadily expanded. The nurse joined the doctor in 1908; power to pay for certain forms of treatment (eyes, teeth, minor ailments, and tonsils and adenoids) was given to education authorities in 1918; and in recent years specialist clinics have been developed. In 1944 education authorities were made responsible for arranging the provision of comprehensive free treatment for all school-children and for the aftercare of children leaving hospital.

Sir Wilson Jameson's latest report on the Health of the School Child[4] testifies to the success of the work of the past forty years. Those who read Charles Booth[5] may recall his description of the children just before the school medical service began: "Puny, pale-faced, scantily clad, and badly shod, these small and feeble folk may be found sitting limp and still on the school benches in all the poor parts of London." Happily, times have changed; and it is a remarkable testimony to progress that Sir Wilson Jameson's report deals mainly "with provisions for raising the general level of child health rather than the detection and treatment of actual defects or disabilities of body or mind." The problems facing the school service are gradually changing. For example, now that nutritional disease detectable by clinical examination is disappearing how are we to assess nutritional state without using the costly procedures of the laboratory? No doubt wisely, the doctor is now asked to comment under the heading of "general condition" rather than "nutrition." In 1947 the number of categories was reduced from four to three (A=good, B=fair, and C=poor), and "what is wanted is the examining medical officer's general impression of the child's physical fitness." Secondly, how can the school service be brought into closer touch with the pædiatric world? Mention is made of the arrangements in the West Riding of Yorkshire whereby in 1947 and 1948 two whole-time pædiatricians were appointed to the school service with the title of child health officer, working both on the curative and preventive sides. This scheme, according to the county school medical officer, Dr. Fraser Brockington, "ensures that all the medical staff engaged on preventive children's work have a specialist as their professional head, to whom they can look for advice and guidance and who sustains their allocations in the best interests of their areas. Boards should also be allowed to provide in their estimates a contingency item to meet supplemental estimates which must occur in this service. Balances should be retained in the accounts of regional boards and would require review at the time of each budget. It may be argued that this is contrary to Governmental accountancy practice, but it should be remembered that the keeping of accounts by hospital authorities on an income and expenditure basis is also contrary to the practice in national finance."

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[1] Yates Bell, J. G. *Lancet*, 1947, ii, 347.

[2] Rothenberg, S., Silvani, H., Chester, S., Warmer, H., McCorkle, H. J. *Ann. Surg.* 1948, 128, 1148.

[3] Yeager, G. H., Ingram, C. H., Holbrook, W. A. jun. *Ibid*, 1949, 129, 797.

[4] Report of the Chief Medical Officer of the Ministry of Education for the years 1946 and 1947. H.M. Stationery Office. 1949. Pp. 151. 3s.

[5] Life and Labour of the People of London. London, 1891–1903.

Financial policy, it is admitted, should undoubtedly be a matter for the Ministry, but the need for instructions on detail is not apparent. "Regional freedom in finance within the limits of a broad Ministerial policy would obviate the need for the issue of instructions on comparatively minor matters."

In the field of capital finance the existing policy of allocating to regions an annual sum of which any part remaining unexpended at the end of the financial year is lost, encourages spending on works having a comparatively low priority; the boards should be allowed to carry forward unexpended capital allocations, and in this way essential major work could be undertaken with the knowledge that the necessary money will be there.

At the same meeting the board agreed to an interim scale of charges to medical and dental staff for board and lodging. This scale has been commended to management committees with a view to securing uniformity throughout the region; and later all four Metropolitan regions will try to agree on a uniform scale. Such a course would go far towards meeting the complaints of registrars who have found that between neighbouring hospitals the charges vary widely.[2]

PROGNOSIS IN CEREBRAL HÆMORRHAGE

When a patient is examined shortly after a stroke it is usually difficult to assess either the immediate prognosis or the risk of further vascular accidents. Tennant and Harman[3] have tried to analyse factors which may influence the prognosis by studying 107 patients with cerebral vascular accidents admitted to the Wisconsin General Hospital. There were 5 cases of cerebral embolism, which are not considered further, 27 of cerebral thrombosis, and 75 of hæmorrhage. In the differential diagnosis of thrombosis and hæmorrhage the criteria suggested by Aring and Merritt[4] from a study of 245 fatal cases have been used, and though these are certainly not infallible they are a useful guide in differentiating the two conditions. The proportion of 75 cases of hæmorrhage to 27 of thrombosis is unusually high, probably because only the more serious cases were sent to hospital—22 of the 75 patients with hæmorrhage died but only 2 of the 27 with thrombosis.

Hæmorrhages from congenital aneurysms were excluded from the series, and only 12 of the patients considered had a hæmorrhage before the age of 40, the greatest number occurring during the sixth decade. The chance of a hæmorrhage proving fatal appeared to be greater if it occurred before 40 or after 60. In general, if the systolic blood-pressure was above 190 mm. and the diastolic above 140 mm. Hg, the risk of death seemed to be increased. The depth of coma did not appear to bear much relation to the outcome of the attack but the duration of coma was of considerable importance; none of the patients who recovered were in coma for longer than two hours, while in the 22 fatal cases coma always lasted for several hours. Another prognostic sign was the occurrence of abnormal respiratory rhythm, particularly Cheyne-Stokes respiration. All except 6 of the fatal cases had long periods of altered respiration, while only transitory abnormalities occurred in the patients who recovered. The series was scarcely large enough for
estimation of the eventual outcome in patient
survived the initial attack, but 10 had a second
hæmorrhage, 4 a third, and 1 a fourth. The mort
second attacks corresponded to that of the first.

Rose[5] studied the problem from a different a
estimating the time between the onset of an atta
death in a series of 205 cases dying of cerebral hæm
of Leeds General Infirmary. His series included 3
in hæmorrhage from intracranial aneurysms and
than 27 cases of apparent cerebral thrombosis in
secondary hæmorrhage occurred about a week af
initial attack, probably the result of alteration
nutrition of an arterial wall in relation to the
softening; this group is of particular importance
the use of anticoagulants is considered in the pres
a cerebral thrombosis. No patient in this series
primary hæmorrhage into the cerebral hemis
survived for longer than four days.

RALLY OF REGISTRARS

The inaugural meeting of the registrars' group
British Medical Association was held in Londo
Saturday, Nov. 26. Some months ago registrars
down the country, persuaded that in their diffi
they must help themselves, began to band them
together into regional groups; and from these
bodies emerged a national committee which conv
the council of the B.M.A. that recognition should
withheld. Hitherto registrars from teaching hos
have tended to hold themselves apart from the
ment; and at last Saturday's meeting the acrimo
debate on constitution, which occupied more
half the day, suggested that some now regret h
allowed their [illegible] to gain unquest
ascendancy. [illegible] turned to p
dissidence vanished; and the day ended with hand
tributes to the antecedent organisation which, th
lacking any powerful backing, had already achi
notable results.

The new group is to press for representation on
various medical advisory committees; for the fillin
hospital establishments with the least possible d
and an assurance that no registrars in established
will be dismissed until these establishments are defi
for an undertaking that fully trained registrars w
notice of dismissal shall not be lost to the service
establishments are known, and that at least two mon
notice of dismissal will be given; and for investiga
of methods of filtering off surplus registrars. A M
chester delegate believed that only 1 in 5 of se
registrars would get a consultant post, and urged
the position of registrars should be clarified; for
present they had no idea what to do. He was alar
by the paucity of vacancies "with reasonable prospec
in general practice, and reasoned that in any even
man who had been doing specialist work for three
four years would need reablement to fit him for gene
practice. The meeting viewed with alarm the apparen
uncontrolled growth in the number of registrar posts, a
agreed that the establishment of consultants must
known before the desirable number of registrars co
be determined. Before the war, it was pointed o
registrar appointments were largely confined to teachi
hospitals. Now, however, such appointments had be
made to small and ill-equipped hospitals with no faciliti
for training, while in the larger non-teaching hospit
a consultant with 200 beds might have as many as ni
registrars. Should there not, it was asked, be a
exchange of registrars between the teaching and th
non-teaching hospitals; for surely, now was the tim
to end the division between the two groups by aimin
at a uniformly high standard. At present registra
were commonly doing the work of consultants; a

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[2] Leading article, *Ibid*, Nov. 19, p. 949.
[3] Tennant, E. C., Harman, J. W. *Amer. J. med. Sci.* 1949, 218, 361.
[4] Aring, C. D., Merritt, H. H. *Arch. intern. Med.* 1935, 56, 435.
[5] Rose, W. McI. *Lancet*, 1948, ii, 561.

Special Articles

THE AGED SICK

REVIEW OF 399 PATIENTS IN CHRONIC WARDS

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or long ago Prof. A. P. Thomson[1] published a table survey of the type of patient treated in a large ningham hospital for the chronic sick. The survey have made at the Withington Hospital, Manchester, iot strictly comparable, because this is a general ital and most of the patients were admitted to the nic wards from the adjacent acute wards. The few ents who were admitted directly to the chronic ds were transferred to the acute wards if their lition required it, and in any case had access to full ay, pathology, and physiotherapy services.

this survey the patient's chance of rehabilitation been considered more particularly than in the ningham survey. Generally speaking, the longer the ent has been bedfast the less are his chances of very; and the best hope of recovery lies with those itted direct to a geriatric unit. But in practice y patients who have long been bedfast can be efited in health, and some can even recover the use heir legs. It is thus important that we should conr the treatment of the many thousands now in ital who were admitted before this new concept of care of the aged was developed.

he 399 patients reviewed here were housed in what formerly an annexe (belonging to the local authority) he general hospital; they are now the responsibility he hospital authorities. They had all been investigated, relegated to the chronic wards as incurable and ding nursing care only. When an active treatment was established in the hospital, it soon became lent that the bedfast hemiplegic patient could be le to walk out of hospital, that the bedfast doubly ntinent patient could be made continent and able eave his bed, that parkinsonism could be improved, t the patient with contracted legs could have his es straightened and learn to walk again, and that bedfast patient with nothing wrong except his age ld be restored to a different type of life. With this wledge and new outlook the rest of the patients in chronic wards were examined with a view to finding ich of them could be treated.

TABLE I

Patients	Manchester	Birmingham
.. ..	135 men 264 women	Men and women about equal in number
r sixty	85% of men 87% of women	92% of men 95% of women
lent more than year	90% of men 89% of women	62% of men 71% of women
nt more than ree years	51% of men 50% of women	26% of men 28% of women
lent more than ve years	26% of men 34% of women	.. ..

The summary of cases (table I) shows the difference tween the type of patient in the Manchester hospital d those in the Birmingham survey.

It should be borne in mind that most of the patients Birmingham were acutely ill on admission, while the anchester patients had been screened by admission to the acute wards before they were sent to the long-stay annexe.

NURSING NEEDS

On reviewing the 399 patients it was found that 25% of men and 31% of women were incontinent (compared with 25% of men and 44% of women in Birmingham). Though the proportion of incontinent patients was reasonably similar in the two sexes, as was also the proportion of those able to sit up, the proportions needing bed *attention differed considerably, being 38% of men and* 51% of women. In the same way, 24% of the men were able to get to the water-closet but only 9% of the women. It seems that men make their way to the toilet, without troubling the nurses, for as long as they can, whereas women are treated as bed cases because it is easier for the nurse to bring a bedpan than to help the patient to the toilet.

PHYSICAL STATE

The patients had all been investigated before, and their record-sheets showed a diagnosis; but sometimes the original disease had been overlaid by another condition: thus rheumatoid arthritis might have ceased to be active, and the patient might now be suffering from the disability of contracted knees. The diagnosis of senility was made as a rule when the patient showed general deterioration, not when there was deterioration of one system.

TABLE II

Diagnosis	Number			Suitable for treatment		
	M	F	Total	M	F	Total
Senility	38	75	113	6	14	20
Cerebral thrombosis	18	35	53	4	24	28
Cerebral arteriosclerosis ..	2	0	2	0	0	0
Myocarditis	7	20	27	4	9	13
Hypertension	10	12	22	2	6	8
Chronic bronchitis	16	11	27	7	10	17
Arthritis	5	33	38	5	26	31
Disseminated sclerosis ..	3	3	6	1	2	3
C.N.S. lesions (mixed) ..	5	4	9	3	2	5
Post encephalitis lethargica ..	8	14	22	8	14	22
Parkinsonism	2	9	11	2	9	11
Accidents (after-effects) ..	2	9	11	2	6	8
Operations (after-effects) ..	5	0	5	3	0	3
Carcinoma	2	13	15	0	5	5
Pernicious anæmia	2	3	5	2	3	5
Tuberculosis	3	1	4	3	1	4
Skin conditions	4	7	11	3	7	10
Others	3	15	18	2	10	12
Totals	135	264	399	57	148	205

M = males. F = females.

In judging the suitability of patients for treatment (table II) the criterion was of course the likelihood of benefit. The amount of benefit to be expected varied; some who were bedfast could probably be improved enough to walk out; others who were bedfast and had to be fed by the nurses might improve enough to feed themselves. Incontinent patients were not included in the group regarded as suitable for treatment, although many such patients can, in fact, be made continent. Assessment must always depend on a personal factor; and probably those admitted to the treatment group who would not improve are balanced by those who might have benefited but were rejected. If the survey had been made before the acute geriatric unit was established the proportion capable of recovery would have been put much lower; but once the possibilities had been recognised it was evident that some 42% of the men and 56% of the women could be improved by active treatment. A few recent cases illustrate how much recovery can be achieved in even the most unlikely subjects.

Mrs. A., aged 64, suffering from a hemiplegia with aphasia, was admitted to the geriatric unit 9 months after the stroke, having received attention in a general hospital. She was bedfast and incontinent, with a contracted right arm but interest and knowledge at a high level." Thirdly, there is the continuing problem of handicapped children. The report makes it clear that the accommodation for epileptics, which has altered little for fifty years, needs to be extended; likewise the spastic child and the partially sighted receive close attention. Besides much else that is of interest and importance, the report discusses physical education, the school dental service, and hospital schools. It emphasises the value of good records of the child's health at school.

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[1] *Brit. med. J.* July 30, p. 243; Aug. 6, p. 300.

LAMBL'S EXCRESCENCES ON THE MITRAL VALVE

ABNORMAL projections from the smooth surface of the cardiac valves are amongst the commonest manifestations of rheumatic or bacterial endocarditis. Attention was first drawn to similar lesions of less serious significance by Lambl,[1] who described small filiform processes on the ventricular surface of the aortic cusps. For many years these curious fibrous tags were thought to occur almost exclusively on the aortic valve, but in 1928 Grant, Wood, and Jones[2] reported their presence on the mitral valve in 70% of 40 normal hearts.

Magarey,[3] who has lately published a detailed study of the so-called Lambl's excrescences of the mitral valve, finds them remarkably common—they were present in 85% of 250 valves examined. The incidence rose from 0% in 22 cases under one year of age, to 100% in 75 cases over the age of 60. They may be single but usually are multiple, often exceeding twenty per valve. They vary in length up to 5–10 mm., and are filiform in shape but sometimes have a bulbous free extremity. Histologically they consist of a core of moderately cellular connective tissue covered by a single layer of endothelium. They are non-vascular but often contain deeply staining elastic fibres, which may be coiled in bizarre fashion. The pathogenesis of these processes, according to Magarey, is by organisation of fibrin deposits. Such deposits were observed by him in 7% of the valves studied, and in several cases partial organisation had already taken place. Since the fibrin is usually deposited in plaque-like fashion, the formation of a filiform process would result from its partial detachment before organisation. Günzel[4] offers an alternative explanation. He suggests that the constant flexing and extending of the valve cusps lead to a surface-fraying of the subendothelial connective tissue. Three observations by Magarey tend to support Günzel's view. Firstly, the absence of blood-vessels from the excrescences does not support an origin from organised fibrin. Secondly, elastic fibres are usually absent from organised fibrin—as for example, in the fibrous adhesions resulting from fibrinous pericarditis. On the other hand, a well-defined zone of elastic tissue is present in the subendothelium on the auricular surface of the mitral valve and would readily account for the presence of elastic fibres in tags arising by fraying. Thirdly, the only easy explanation of the bizarre coiled shapes assumed by the elastic fibres in the excrescences is that they result from sudden rupture of these fibres, such as would be expected through fraying from the surface. Whilst some filiform excrescences may arise by organisation of fibrin deposits, in most cases mechanical disruption would appear to be responsible; and their more frequent presence on thickened, and presumably less flexible, cusps supports this view. Moreover, the quite common association of these bodies with fibrin deposits upon the affected valve-cusps may well be a result, rather than a cause, of their presence, since any unevenness of the endothelial lining of the vessels is known to predispose to fibrin and platelet deposition. The organisation of such deposits will lead to thickening of the valve with gradual submersion of the filiform processes, as was observed by Magarey in several of his cases. The gradual thickening of valves commonly associated with increasing age therefore be due to a combination of wear-and fraying with the organisation of fibrin, whose depos is thus favoured. Changes of the same order take in the arterial system, if, as Professor Duguid[5] suggested, the intimal thickening of atheroscle is traceable to thrombosis.

IMPOTENCE

PROBABLY less than 10% of cases of impotence are to organic causes; but these causes are neverth very numerous, as Dr. S. Leonard Simpson was ab show in opening a discussion by the Medical Societ London last Monday. One of the causes that is ap be forgotten is diabetes, possibly because—as Dr. Sim observed—diabetics seldom volunteer this symptom. these patients, said Dr. W. G. Oakley, impotence arise in two ways: first, when they come under treatm and as soon as the diabetic state is stabilised the impot disappears; and secondly during the course of the di even when stabilisation is complete. In the latter g libido is not lost, testicular biopsies are normal. and sperms also are normal though the count may be slig reduced; yet the symptom proves intractable to tr ment. The cause, Dr. Oakley thinks, may possibly a neurovascular defect, or else endarteritis in the ves concerned in erection (and Mr. S. M. Cohen later sho that peripheral vascular disease is an important ca of impotence); but Dr. Simpson believes that someti the origin may be functional.

As to the undoubtedly functional cases, Dr. E. Strauss claimed that the commonest cause is anxie conscious or unconscious, primary or secondary. Strauss emphasised that sexual vigour is largely gene cally determined; and a "virile" physique is necessarily accompanied by great sexual vigour. W he terms "psychosexual impotence" may arise in number of different ways: (1) as "honeymoon" imp tence, which derives from ignorance, nervousness, a weariness, and may persist through memory of init ineptitude; (2) from masturbation anxiety, where t man is the subject of symbolic castration; (3) fro perverse components such as a sadomasochistic impul or homosexuality; (4) from unresolved incestuo attachments ("not a Freudian whimsy"); (5) fro unconscious fear of aggression; (6) through psycho-sexu immaturity (where the wife is commonly a "nice woman who is loved and respected, and only a "fast" woman i thought to have any interest in sexuality); (7) as relativ impotence, where the man is unable to achieve coitu with one particular woman, usually his wife; (8) a "soldier's impotence," where a brief courtship an honeymoon are followed by protracted separation i which the man may build up a fantasy picture of his wife or come to prefer sociality to sexuality, or becom sexually promiscuous and then prove impotent whe tenderness is demanded; (9) in association with a depre sive syndrome; (10) as an inability to ejaculate (usually associated with a narcissistic temperament; (11) owing to fatigue; and (12) owing to boredom, through rigid regard for convention. This list was supplemented by Dr. Henry Wilson, who suggested that sexual impotence i commonly one manifestation of a sense of general impotence in every field.

The meeting touched little on the question of treatment. This, according to Dr. Strauss, may be very easy or very difficult; and he conceded that there is substance t the argument of Dr. A. P. Cawadias that a holistic and humanistic approach may prove as profitable as the analytical. Mr. Kenneth Walker urged that before treatment is started the wife should be seen. Often she can throw light on the cause; and sometimes she i the cause.

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1. Lambl, D. F. Wien. med. Wschr. 1856, 6, 244.
2. Grant, R. T., Wood, J. E. jun., Jones, T. D. Heart, 1928, 14, 247.
3. Magarey, F. R. J. Path. Bact. 1949, 61, 203.
4. Günzel, W. Beitr. path. Anat. 1933, 91, 305.
5. Duguid, J. B. Lancet, Nov. 19, p. 925.

lliot Gorst, K.C., instructed by Sir Robert Gower, r, appeared for the practitioner.

ing the case, Mr. Taylor explained that the majority complaints arose from the association of Dr. Lyburn e Lyburn Clinic.

J. C. Hall gave evidence of replying to the following isement in the *Daily Telegraph* :

LYBURN CLINIC Tunbridge Wells. Tel. 1706. Fully d with X rays, laboratory, physiotherapy, &c., for the l and treatment of chronic cases.

ly he received a letter from Dr. Lyburn enclosing as described as a case-book, on the cover of which were l the title, address, and telephone number of the nd Dr. Lyburn's name and professional qualifications. ply stated that an inclusive charge of 16 gns. for a was made, and for an overhaul which only took a charge of 10 gns.

H. E. J. Martin, advertising clerk, *Kent and Sussex* , told of the handing in by another person of an sement headed : "Here it is! Dr. E. F. St. John presents his Fancy Dress Dance and Carnival. . . ." ; another saying : "Dr. 2108 will speak on the National Act." The accounts were sent to Dr. Lyburn and he believed the cheque was signed "Sands."

. H. Deag, deputy manager, Tunbridge Wells publicity nent, gave evidence on the notices about "Dr. Lyburn's ial Medical Gymnasium" in *What's On in Royal dge Wells.* On the first two occasions on which the announcements appeared, Mr. Deag recollected urn giving verbal instructions for them to be inserted ; not remember who came on the third occasion. He that for many years Dr. Lyburn had been carrying on ive political campaign in the division. Since the lings had been taken the institution had been called announcement "The Tunbridge Wells Remedial sium," not "Dr. Lyburn's."

F. Moon, in evidence, said that on the gate of what erstood was Dr. Lyburn's house appeared the number " painted on in the same manner as a street number. xamined, he said he was not sure whether the number as preceded by the word "Ex."

yburn told the council from the witness-box how he mpaigned for diagnostic clinics. During a serious he had made a solemn vow that if he recovered he would his life and all he had to getting diagnostic clinics people of this country and America. When he got organised a clinic at Hastings similar to the one at lge Wells, except that it was bigger. "I paid for ing myself," he said.

939 he had joined the Labour Party. Before he went our in Wales he consulted the Registrar as to what d say ; he was told that it would be necessary for a ry complainant to bring an action against him for sing. Dr. Lyburn also stated that he had written a *he Fighting Irish Doctor*, and articles in newspapers. fought elections in the Tunbridge Wells district and stood there as the only independent medical candidate country, demanding diagnostic clinics.

clinic at Tunbridge Wells was equipped at his own —there was about £10,000 worth of equipment in it. 1200 complete overhauls a year were done. Expenses out £4000 a year, and so far it had never made a profit. ught it his duty to go into the National Health and see if it would work, so he enrolled as a general oner. He limited his patients to 500. If he had he could have had many more. He had put his al Health Service number on his gate for political es—"a number I was, not a person." He had now d, "because my case-records, and the story I may tell will indeed shake many human beings because overloading of our hospitals, which are doing wonderful and the strangling of the general practitioner without ay."

dvertised in the *Daily Telegraph* because he felt that n open advertisement in a national paper would give a of getting diagnostic clinics. The paper cut out the : "Bevan ought to provide them," which he included. o submitted a similar advertisement to the *British l Journal.* The accounts for the advertisements in *ent and Sussex Courier* might have been sent to him. He referred them to the appropriate authorities, and they were paid for by the treasurer of the clinic. In cross-examination, Dr. Lyburn said the club accounts were separate from his own. His own name had been used in the title of the club inadvertently. Directly he got the letter from the council the title was changed.

Miss Lilian Sylvia Edwards gave evidence that she was treasurer of the Tunbridge Wells Physical Training Club. This had been called the Lyburn Physical Training Club originally at her suggestion. She said the account stood at £3 credit. Dr. Lyburn had never received any of the proceeds.

Mr. Gorst, in his closing speech, submitted that what Dr. Lyburn had done was not infamous conduct. What he did, and what he always had in mind to do, was to foster and illustrate the idea that diagnostic clinics were a necessity. "He has not sought in any way to act detrimentally to other practitioners." Dr. Lyburn had not sought patients.

Mr. Taylor submitted that Dr. Lyburn was not entitled to do what he had done because he was activated by political motives, and asked whether it was conceivable that the advertisement in the *Daily Telegraph*, if it were an attempt at political propaganda, would have been inserted in that form ?

At the conclusion of these speeches, the Legal Assessor said it was manifest that Dr. Lyburn had been advertised. According to the letter of the charge, he was charged with advertising for the purpose of procuring patients and/or promoting his own professional advantage. "I think the council understand that you, Mr. Gorst, say that although he has been advertising, he has not been advertising for that purpose. Mr. Taylor invites the council to conclude that he has been advertising for that purpose, among other purposes." Supposing the council formed the view that the main purpose of the advertisement was to assist Dr. Lyburn to win a seat in Parliament at the next election, did Mr. Taylor say it was an offence against the Warning Notice, and did Mr. Gorst say that it was something which it was legitimate for a doctor to do ?"

Mr. Gorst : "I do. I say that the mind which goes behind the act is the dominating consideration."

Mr. Taylor thought it could not possibly be conceived as furthering Dr. Lyburn's candidature ; but if so it was still improper and within the confines of the Warning Notice to advertise in this particular form, which, in his submission, inevitably meant the promotion of Dr. Lyburn's own professional advantage.

The Legal Assessor : In other words, whatever his motives he must be deemed to foresee the natural consequences of his act ?—Mr. Taylor : Yes.

After a long retirement, the President announced that the council had found the facts alleged against Dr. Lyburn proved to their satisfaction in five of the charges.

Addressing Dr. Lyburn the President continued : "These facts bring you within the terms of that part of the Warning Notice which expressly states that advertising by a practitioner is, in the opinion of the council, contrary to the public interest and discreditable to the profession of medicine, and that any practitioner who resorts to any such practice renders himself liable on proof of the facts to have his name erased from the Register. Even if your attention has not been particularly drawn to the council's advice already, it should have been obvious to you that the kind of advertisement to which you have lent yourself cuts at the root of decent relationships between professional colleagues. You have told the council about your motives in committing your indiscretions and you have sought to argue that you may do with impunity as a politician that which you are forbidden to do as a medical practitioner. The council holds any such distinction to be logically and practically untenable. The council, however, feels itself justified in postponing judgment with the object of allowing you an opportunity to consider in the light of these proceedings and in terms of this decision what course you will take in the future. The council thinks that a period of six months will give you ample time to make up your mind on this point. You will therefore be summoned to appear before the council at the next session in May, 1950, and before that session you will be expected to furnish names of your professional colleagues and other persons who may feel satisfied with movement in her right leg. After rehabilitation this lady walked out of the hospital unaided, perfectly able to control her bladder and starting to talk again. Although her social circumstances had been investigated fully, she relapsed after returning to her daughter's home, and was readmitted with incontinence. A few days after her readmission to the geriatric unit she made a complete recovery again. She is now talking much more, having continued with speech-training. She is suitable for a long-stay annexe.

Mrs. B., aged 72, admitted to the geriatric unit as a bed patient, having been confined to bed for almost 3 years after a fracture of a right femur. She was also suffering from myxœdema, which had not been noticed. This lady is now walking in the grounds unaided and is awaiting admission to a hostel.

Mrs. C., aged 79, admitted for treatment, having been in bed for 2 years with contracted knees and rheumatoid arthritis of other joints. She is now being re-educated in walking and can, in fact, walk a little. It is hoped to discharge her to her home.

Mrs. D., aged 75, has been in bed for many years, complaining chiefly of pain in her back. Nothing abnormal was found and she was got out of bed. She is now fully dressed and up all day, and awaiting transfer to a long-stay annexe, since her home circumstances are not good.

Mrs. E., aged 73, was taken over from a chronic department, having been in bed for at least 18 months. She was doubly incontinent and mentally confused; the nursing staff thought there was nothing to be done. Within a period of 5 weeks this patient was up and dressed, able to walk short distances, had not soiled her bed for some time, and was mentally improved.

Mrs. F., aged 71, suffering from parkinsonism, had been bedfast and unable to turn over in bed or feed herself for many years. She is now able to turn over in bed and feed herself, and her tremor is much reduced.

CONCLUSION

The aged sick are only too often described as living a vegetable life in institutions. By adequate medical care we can hope to restore them to activity; moreover we can save hospital beds and nurses for those whose need is greater. One great difficulty in treating these patients is to find suitable quarters for them when they no longer need continuous medical and nursing care. This factor alone keeps many long-stay beds blocked. Since prevention is better than cure, I suggest that for proper medical care of the aged we need:

1. Active geriatric units attached to general hospitals, with additional accommodation for long-stay patients.
2. Outpatient units, providing treatment for the patient before he needs admission to hospital and able to follow him up after discharge from hospital and supervise his treatment.
3. Domiciliary teams, able to see the patient in his home and bring hospital services to him there. In some cases this care would make admission to hospital unnecessary.

GENERAL MEDICAL COUNCIL

SESSION NOV. 22–24

As recorded last week, Prof. David Campbell took the chair on his election as president in succession to the late Sir Herbert Eason.

Disciplinary Cases

Robert Hope Robertson, registered as of South View, Eldwick, Bingley, Yorks, M.B. Edin. (1927), appeared on a charge of having enabled Jules Samuels, of Weteringschans 73, Amsterdam, an unregistered person, to give advice and treat Miss Clara Louise Bruce, and of having allowed Francis Percival de Caux, an unregistered and unqualified person, to attend and treat Miss Bruce, without having made proper inquiries in either case. The complainant was Miss Bruce.

Mr. Gerald Howard, counsel, explained that Dr. Samuels practised medicine in the Netherlands; he had a medical degree in Holland and a degree which enabled him to practise in Germany, but he was an unregistered practitioner so as this country was concerned. In the second paragraph section 2 of the warning notice relating to unqualified a and covering, the words "*giving of advice*" did not app but the preamble made clear that the instances given in notice "do not constitute, and are not intended to constit a complete list of the offences which may be punishable erasure." The charge was worded to enable the council, i found the facts proved, to decide whether a practitioner enabled an unregistered person to give advice rend himself liable to have his name erased from the Register.

de Caux had been a registered practitioner but had had name erased from the Register following a conviction abortion and had had his qualifications removed by appropriate bodies. Mr. Howard said he could not reco another case where the unregistered person had in one insta been a foreign qualified person and in the other had previously a registered person.

Miss Bruce, in evidence, said she had developed a swellin the breast. On the advice of her doctor, she went to the Eliza Garrett Anderson Hospital, where she was advised to hav operation. She did not have the operation. Her brother thou would be a good thing for her to see a Dr. Parsons, but they f he had gone away, so she saw Dr. Robertson, who examine and showed her a book with pictures of a woman who had ca showing her condition before and after treatment. She a Dr. Robertson if this could happen to her, and he said: "If i a sister of mine, this is the treatment she should have." She electrical and sunlight treatment three times a week, and Dr. Robertson asked her if she would go to Amsterdam t Dr. Samuels.

Miss Bruce said she was examined in Dr. Robertson's pre by de Caux, who said he had studied under Dr. Samuels when Dr. Robertson was ill she was treated by de Caux. Wh was treating her, she went with him to Amsterdam, wher was examined by Dr. Samuels. In answer to Sir Sydney, S witness said Dr. Robertson had nothing to do with her vi Amsterdam.

Mrs. Maud Davis said that when Dr. Robertson came to se sister (Miss Bruce) he told witness: "Before I can treat sister I must be paid 50 guineas." Mrs. Davies said they woul the money, but when he added that the treatments would guinea a time she knew they could not pay that. Dr. Rob said that as they were paying 50 guineas he would treat Mis for half the fee. He had said Dr. Samuels was a clever man a (Robertson's) treatment was the same. He showed a letter Dr. Samuels saying how many treatments a week to give her

Mr. Howard read a letter from Dr. Robertson sayin did not know de Caux had been struck off the Register had made arrangements for de Caux to continue the treat while he was ill, in good faith. Dr. Robertson, who wa represented, told the council that de Caux came to se diagnostic apparatus. He had been mentioned by Dr. Sa and he had a "Harley Street" address. Dr. Robe declared that he had never said Dr. Samuels could cure ca Dr. Robertson added that he had been associated unregistered men ever since he took a degree in osteop He had resigned from the British Osteopathic Associati which he had been vice-president, because he had l serious disagreement with them about policy. He consi that medicine would absorb osteopathy. The council the facts alleged against Dr. Robertson not proved to satisfaction.

Geoffrey Roderick Richards, registered as of 26, Conn Street, Port Talbot, Glamorgan, M.R.C.S. (1937), appeared charge of having been convicted at Northampton on Ju 1946, on eight charges of failing to keep, in accordance the provisions of Regulation 11 of the Dangerous Regulations, 1937, a register in the form set out i second schedule to the Regulations, and of having bee victed on July 6, 1949, on five charges of unlawfully proc drugs. The council found the convictions proved, postponed judgment for two years.

James Thomas Wybourn, registered as of 67, Bid Mansions, Elgin Avenue, London, W.9. M.R.C.S. (was charged with having been convicted on May 31, at London quarter sessions. The case was heard in ca The council found the conviction proved, but did not Dr. Wybourn's name from the Register.

ALLEGED ADVERTISING

Eric Frederick St. John Lyburn, registered as of Spa (Tunbridge Wells) Ltd., Tunbridge Wells, M.B. Dubl. (was charged with infamous conduct in a professional re The charge concerned alleged advertising to procure pa and/or promote his own professional advantage. The plainants were the Medical Defence Union, who were sented by Mr. N. Leigh Taylor, of Messrs. Hempsons, soli

hing, or being bumped by somebody. It was not
d worthy of consideration that these trifling
ons mean nothing to non-hæmophilic people and
is impossible, in normal surroundings, completely
oid them. Nor was I ever praised for avoiding
catastrophes by prodigious efforts and continual
fulness. All blame and no praise produces appalling
piness, whether in a child or an adult, and makes
eel that he is indeed a "bleeding nuisance" to
f and everyone else.

the time I was seven I was able to report to the
s that my bleeding bouts came in fortnightly
. In one fortnight I bled seriously from even
ost trivial causes, whereas in the next fortnight
seriously only if the injury was severe enough to
bruising in normal people. But my perspicacity
nrewarded and nobody took any scientific interest
observation. It was not until many years later
worked out the precise periodicity of this monthly
so that now I know that there are twelve fort-
in the year when I must be extra specially careful
welve fortnights when I can relax my vigilance a
with progression and regression from one to the
; and I try to adjust my life accordingly. This
ly phase is complicated by a seven-year and other
sily recognisable phases. From my birth to the age
vas a bad time, from 7 to 14 was less severe, and
14 to 19 was very bad. Since then treatment has
it difficult to detect the seven-year phases.

issed something like a third of my schooling through
ecurrent hæmorrhages, and even when I could
l school the pain and discomfort, coupled with the
cteristic lethargy of the malady, made me often
ntive, for which the thoughtless and unimaginative
r was apt to punish me. In spite of these handi-
I always went to the top of the class in most
ets on the rare occasions when I had a fortnight
ore at school without interruption. It seemed a
and unjust reward for my efforts that my end-of-
reports invariably included the phrase, "This
has brains but is too lazy to use them." So nowa-
I find that my education is like a book with a page or
missing from every chapter. It is embarrassing
I am faced with some elementary mental exercise,
times so and so, and find that the 7-times table
nissing page in my knowledge, because I was away
a hæmorrhage when my class did that one.

e feeling that I was unpleasantly different from my
s persisted and was aggravated by day-to-day
rences. It was humiliating having to take a
to school asking to be excused all sports, after
l been desperately ill several times following trifling
lents on the field. As the headmaster was the
et-and-soccah type I became in his eyes something
r than the lowest form of animal life to the end of
chool days.

1933, when I was in my early 'teens, I was put in
pital ward with two other hæmophilics, and after
chats we realised with a wonderful sense of relief
we were not each a unique monstrosity, but that
e were others who led *our* sort of life and who had to
our sort of problems. I then and there resolved to
a club or society of hæmophilics in which each could
the other over their stiles. But alas for the resolves
hæmophilic! The exacerbations put paid to any
or project of this kind, and it was not until 1942
the International Hæmophilia Society was formed.
body but other hæmophilics seems willing to help us
h our difficulties. Help may be forthcoming once,
ce, or even thrice, but the hæmophilic's condition
everlasting, yet so erratic that he can be completely
ependent in the morning and bedridden and hope-
ly dependent on others by the evening, often without
rning, so that no provision can be made.

The worry and strain of this continuous Sword of Damocles hanging over the heads of hæmophilic families impairs any chance of social and domestic well-being. Then in adult life the inability of the hæmophilic to be a breadwinner all the time, though it is not his fault, often produces that sordid bickering state well known to social workers. Inevitably therefore the hæmophilic leads a lonely life, for his physical condition is too uncertain to enable him to go out or clear out, and *poverty, which is inevitably the lot of most hæmophilics,* makes it impossible for him to play host to anyone he feels an affinity for.

I am amazed how seldom the healthy and fortunate will help the disabled in the many ways open to them. For example, many people with cars know that I am often stuck in the house for days or even months on end while recovering from one of my heavier losses of blood, but they never offer to take me out for a change of scenery once in a while. Is it surprising therefore that the disabled hæmophilic becomes morbid when he sees cars floating by with bags of room for a disabled passenger?

It is only when the hæmophilic can afford to hire or own a car that pleasure and *regular* work are possible in his life. With a car to take him about the hæmophilic can hold down a full-time job for years, with little more than average sickness absenteeism, whereas the hæmophilic who has to rely on the vicissitudes of public transport cracks up in no time. A car is a desirable amenity to most disabled people; but to the hæmophilic it is a vital necessity.

Apart from the periodic lethargy that foreshadows a "bad" phase, hæmophilia does not impair one's physical or mental health unless some bleeding has taken place; and since bleeding occurs only as a result of trauma one has merely to avoid all trauma and one will prevent the consequent crippling and paralysis. Q.E.D. In practice, of course, it is impossible to avoid all trauma, but that should be the main aim of the hæmophilic's daily routine. Just as the diabetic has to adhere to a strict diet, so the hæmophilic must follow an equally strict anti-traumatic regimen. And just as the diabetic's blood-sugar level may go up unpredictably, so does the hæmophilic's blood-clotting function vary, often unpredictably (in my case, as I have said, there is a definite monthly phase). We hæmophilics have as yet no simple urinalysis to tell us when special care is necessary and there is a limit to the number of blood tests that can be taken day by day. So our life-long motto must be "eternal vigilance."

Of the 30-odd treatments tried on me, only one—an antihæmophilia egg-white derivative[1]—has stopped or prevented the bleeding as and when required. Of the remainder, sunlight, diathermy, physiotherapy, and vitamin concentrates have improved my general health, particularly during post-hæmorrhagic convalescence. Local styptics I have found useless and sometimes harmful. Blood-transfusion has a secondary anticoagulant effect in me and I have to refuse it. The benefits of manipulation can be more effectively obtained by safer means. Analgesics, though sometimes necessary, must be taken with caution; aspirin, for instance, is an anticoagulant and risky for the hæmophilic.

I am sure that clinical trials of hæmophilic remedies often fail because the natural variations in the disease are not taken into account. The hæmophilic usually reaches hospital in a "bad" phase, because that is when emergency hæmorrhages occur, and the improvement in blood-clotting which can spontaneously follow this phase may well be credited to the treatment applied. Conversely, if a treatment is tried when a "bad" phase is due it may be unfairly condemned.

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1. Timperley, W. A., Naish, A. E., Clark, G. A. *Lancet*, 1936, ii, 1142.

that you have relinquished the procedure set out in the parts of the charge which have been found proved."

Dr. Lyburn asked whether, if he spoke as a politician during the coming election, he would be breaking the rules of the council, which he was loth to do? The President: You will have to decide that for yourself.

ADJOURNED JUDGMENTS

The council did not direct the registrar to erase from the Register the names of the following practitioners who appeared for postponed judgment: *William Melrose*, registered as of 15, St. Paul's Square, Liverpool, L.R.C.P.E. (1924); *Reuben Denny*, registered as of 64, Twyford Avenue, Acton, L.R.C.P.E. (1929); and *Archibald Thomas Macmaster Glen*, registered as of 16, Telford Avenue, London, S.W.2, L.R.C.P.E. (1935).

NAME REMOVED

Arthur Mervyn Rhydderch, registered as of Coppelia, Clements Road, Chorley Wood, Herts, M.B. Camb. (1937), M.R.C.S. (1926), had had judgment postponed in November, 1948, for two years, following convictions for driving and being in charge of a motor vehicle whilst under the influence of drink; he was directed to appear at the council's session in November, 1949. He had since been convicted for a different offence. After taking evidence *in camera*, the council directed the registrar to erase his name from the Register.

RESTORATIONS

The President announced the restoration to the Register of the names of *David William Jones* and *Duncan Metcalfe Morison.*

Council Affairs

Prof. R. J. Brocklehurst presented a report from the education and examination committees acting jointly. On the assumption that legislation might be introduced at an early date to give effect to the recommendation[1] of the Interdepartmental Committee on Medical Schools regarding compulsory house-appointments as a pre-registration requirement, the committees have held a preliminary discussion of the conditions to be attached to such appointments.

The committees recommended that the council should request the licensing bodies, as soon as they are in a position to do so, to furnish information as to changes made by them since the publication in April, 1947, of the recommendations of the council as to the medical curriculum, in the courses of study and examinations for qualifications conferring the right of registration under the Medical Acts. The committees also recommended that the council should resume the visitation of examinations for qualifications conferring the right of registration under the Medical Acts, and that the first should be on examinations in social medicine and public health, pharmacology and therapeutics, and forensic medicine.

The President presented the report of the Pharmacopœia committee, of which he is chairman. Sales of the new *British Pharmacopœia* from May to November, 1949, were 2739 copies, bringing the total sales to 38,182.

The British Pharmacopœia Commission has selected material to include in an *Addendum* to the *British Pharmacopœia* to be published towards the end of 1950. The commission has also reviewed the comments, criticism, and suggestions for the *British Pharmacopœia,* 1953, and drawn up a tentative scheme of contents. The commission has accepted an invitation from the Scandinavian commission to cooperate in the selection of names for new drugs. The commission has discussed with the Home Office the question of excess volume in ampoules. It regards this as an advisable and legitimate pharmaceutical practice, and it is hoped to overcome difficulties which have arisen in the administration of the Dangerous Drugs Acts.

STAFF APPOINTMENTS

At the end of the session it was announced that Mr. Walter Kinnear Pyke-Lees, assistant secretary of the council, has been appointed registrar in succession to Mr. Michael Heseltine, C.B., who is retiring not later than September, 1951. Mr. Martin Robert Draper has been appointed assistant registrar.

Disabilities

43. HÆMOPHILIA

WHEN I am asked " What is
it affect you ? " I can reply, q
everlasting bloody nuisance. I cannot empl
strongly its *everlasting* nature, for my friends
tions, and even some doctors who have atte
think that I am not ill at all except when I an
bleeding. But in fact the hæmorrhages are the
most dramatic manifestations of a diseas
constant but less striking physical and mental effe
the unfortunate sufferer all the days of his life.
specifically to the ankyloses, contractures, a
fibroses, peripheral anæsthesias, and areas of
circulation resulting from successive hæmato
hæmarthroses, coupled with the debilitation
from prolonged anæmia and almost constant pai

My hæmophilia was first diagnosed at the
5 months when a cranial hæmatoma followed
From then until the age of 19, when I was fir
effective treatment, I was never free from hæ
hæmorrhages for more than six weeks at a ti
was rare for one lot of effusions to have cleared
before another bout of bleeding (usually internal)

There was always a traumatic cause for every
rhage—a strain, a blow, or a cut—but sometin
was so trivial as to seem almost fanciful. It
take much to bruise an over-ripe tomato, and
what a hæmophilic is like. (Incidentally, I wi
doctors and students, before they handle hæmo
would practise juggling with over-ripe tomatoe
they have developed enough delicacy of touch to
damaging the squashy fruit.)

Very early in life I became puzzled about why
treated differently from other children in genera
from my brother in particular, he being a little
than me and not a hæmophilic. My life was a co
" Don't do that! Don't go there!" and if I did,
a row there was. But such restrictions did not
to my brother or other children, and I got more and
worried over this unfair discrimination that seemed
directed solely against me. Then, one day, in a fri
tussle with some children, I lammed out and u
tunately caught a little girl a fourpenny one,
she bawled the place down, with the result that I
reprimanded and told that " little girls must be tr
more gently than little boys because they are differe
What a relief this remark was to me, for I immedi
thought that must be the answer to my problem
must be more careful than other children becaus
was a little girl, and girls were more delicate than b
But this pleasant theory was soon exploded. My s
hair, my clothes, and the fact that I started going t
boys' school made it plain that I was on the wrong tr
and back came the misery and worry.

My life was a constant oscillation between attempt
normal activity and being bedridden after a tum
while a mysterious lump came up, usually in a joi
got " red hot " and excruciatingly painful, and th
slowly dispersed, at which stage I began to hobble abo
again. Then after a few days of progressive activi
the cycle started all over again, and again, an
again.

When I was six I was called to the headmistres
study to be shown to the school inspector, to whom sh
described me as " a bleeder." I had just becom
acquainted with the expression " a bleeding nuisance,"
so I naturally associated the word bleeder with th
and became even more miserable; for of course every
time a hæmorrhage started I was thoroughly nagged,
albeit well-meaningly, for falling over, bumping into

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[1] Goodenough Report, p. 196.

Letters to the Editor

ROYAL MEDICAL BENEVOLENT FUND

—I beg to remind your readers of the President's mas appeal (*Lancet*, Oct. 29, p. 814) as the gifts stributed before Christmas day.

will acknowledge that the winter months are ally difficult and hard for old people living on small es. I therefore ask those who are willing to help nd in ensuring extra comforts and cheer to its y beneficiaries to forward their contributions as as possible, marked "Christmas Gifts," to the i Medical Benevolent Fund, 1. Balliol House. r Fields, Putney, London, S.W.15.

C. LUTHER BATTESON
Hon. Treasurer.

HOSPITAL ADMINISTRATORS

,—Mr. Hackwood's letter of Nov. 19 demonstrates uncommon confusion between administrative and al staff. Staff engaged on purely clerical duties d be regarded as technicians in their particular cts. They bear the same relationship to their aistrative heads as, for example, laboratory tech- is bear to directors of pathology. The Bromley s apparently classify under the administrative ng those jobs which have an administrative content e clerical field, whether central or local, and are thus ctly expressed.

the general subject at the heart of Mr. Hackwood's , one has always looked to the voluntary teaching ital for medical freedom. Such freedom was not ely lacking in the municipal hospitals, and clearly as these hospitals turned towards clinical division. cal freedom (consistent with service good) is still i more important than administrative fancy, but oust know clearly what is necessary to ensure this lom. The medical advisory committee mechanism, ing parallel with the system of medical firms—the pattern of the "voluntaries"—should at the ient be adequate safeguard: and it is, despite icion to the contrary, completely proof against "lay ination," especially with medical representation on ital management committees.

he question should now be asked: is the coexistence 1) clinical division, (2) the medical advisory com- ee, (3) the medical superintendent, and (4) medical esentation at management-committee level likely to e clinical freedom? One among these is obviously of pattern, and it must be for the profession carefully onsider which shall go.

the final decision is that doctors shall administer, , logically, they should *completely* administer— ospital and at management-committee level. No tary can demur if this is, after full consideration. to be for the good of the service. But the question es again—would this spell medical freedom? What the clinicians think?

W. J. CRABB.
Secretary, Fulham and Kensington
Hospital Management Committee.

"TEETHING POWDERS"

SIR.—It has been suggested that mercury poisoning y be the cause of infantile acrodynia, and that eething powders" are the source of the mercury.[1] It is difficult to reconcile the history of many cases of rodynia with mercury poisoning, and the proof has so r rested upon the microanalysis of urine. The interest used by this work, however, made us aware that ething powders are very commonly used.

With the help of members of the Kent child-health service an inquiry was made of 100 mothers of children aged 12–24 months attending five different clinics. Mothers of children of this age were chosen because the peak age-incidence of acrodynia is about 10 months, and it was hoped that memories would be long enough to cover the second half of the first year.

The results have been interesting. More than half the infants (53) were given such powders. The most popular powder in use is one containing calomel (48 cases): grey powder was used for 4 infants. Powders were frequently given in the first few weeks of life and continued for months as a weekly dose. The reasons for using powders varied from "the mother has great faith in them" to more specific reasons such as "fretful with teething," irritability, restlessness at night, sore gums, constipation, or digestive upset. The advice to use the powders was offered 18 times by a grandmother, 18 times by a neighbour or friend, 4 times by a doctor, 3 times by a chemist, and once by a midwife. The families were evenly divided between town and country, and the proportion of powder-users in the two groups was the same. None of the children developed symptoms of acrodynia; as might be expected, the few children reported to be victims of infections and who failed to gain weight regularly, were mostly powder-takers.

Children's Department,
Farnborough Hospital, Kent.

DUNCAN LEYS.

ÆTIOLOGY OF PEPTIC ULCER

SIR,—One can readily agree with the comment in your leading article last week that the evidence brought forward in the same issue by Dr. Doll and his colleagues need not be interpreted as supporting the hypothesis that hypersecretion is the cause of chronic peptic ulcer; but this does not mean that either the opposite view or the suggestion which you have advanced are satisfactory alternatives. It will be generally agreed that the answer to a medical problem should, whenever possible, offer a physicochemical explanation, and one may therefore leave "autodigestion" and the "inborn diathesis" out of discussion because biologically they are unsound arguments and in any case they only remove one difficulty to replace it by another one.

The fact that chronic ulcer is invariably associated with high acid values has led to the unwarranted generalisation that excess of hydrochloric acid is the only factor in the causation of all types of chronic ulcer. There is no difficulty in accepting the acid factor as the cause of the œsophageal, jejunal, and Meckel's diverticulum ulcers, which belong ætiologically to one category of lesion: but, a priori, hydrochloric acid cannot by itself produce the ulcers situated in the stomach and first part of the duodenum, which belong ætiologically to a different category of lesion. There is experimental evidence to support these theoretical considerations. This distinction in the classification of ulcers is of fundamental importance, for it leads to the inescapable deduction that there must be a second factor in the production of the latter type.

Since hypersecretion always accompanies the active ulcer, it is necessary to define in what relationship they stand to each other. Hypersecretion forms a constituent part of the "syndrome of hyperfunction" which embodies the normal reaction of the stomach in response to a stimulus; the persistence of an unusual stimulus produces the exaggerated physiological response which becomes a pathological entity. The syndrome of hyperfunction—which is pathognomonic of the disease—is an expression of a state of irritation which appears as a functional disorder in the period of transition before the establishment of the organic lesion—i.e., it represents the pre-ulcerative stage.

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[1] Warkany, J., Hubbard, D. M. *Lancet*, 1948, i, 829.

In England Now

A Running Commentary by Peripatetic Correspondents

"It takes a fortnight to cure a cold; if you leave it alone it gets better in two weeks." I have just learnt the sad truth of this cynical statement. As I woke up this morning with a streaming cold I recalled a recent article saying something like: "The initial stage of a cold is an allergic reaction which in nearly 98% of cases can be instantaneously cured with antihistaminics." I had only to reach out for the latest sample, and down went an enormous dose. It put me to sleep for several hours but left my cold wide awake. The local chemist tried to be helpful: "A thousand milligrammes of ascorbic acid will soon get rid of your cold," he advised, and made me swallow twenty tablets of vitamin C every few hours. My friend, the physiotherapist, was very sorry to hear that I had a cold. "Some U.V.L. and local short-wave will soon fix it," he pronounced cheerfully and proceeded to treat me with childlike faith and conviction. Home at last, after a busy surgery where the treatment of colds was the main item on the agenda, I placed myself again in the soporific arms of antihistaminics, endured the astringent taste of ascorbic acid, and was just about to try a new vasoconstrictor on my nasal mucosa when my wife said: "Take two aspirins and a hot drink and you'll be cured tomorrow." Tomorrow? From tomorrow it will be only thirteen more days to go. . . .

* * *

The method of writing to the family doctor on the discharge of his patient from hospital is changing. Instead of the informal chatty letter, the modern habit is to despatch a scientific summary, resplendent with biochemistry but stripped of humour and intimate clinical details—a dull document. Fortunately, in acting as scribe (or registrar) to the firm, I have been set a high standard of the older school of writing by my chief. May I give you an example? The professorial hand wrote as follows:

Dear Dr. X,

Thank you for referring Mr. Jones to me; a dear old man, who told me, and I have no reason to doubt it, that he is 86. He opened his story with an account of how, in the earlier part of the eighteenth century, there was a medium who, under suitable condition of trance, would float out of the window feet foremost! Mr. Jones claims kinship with this gentleman, because at certain periods of his life he too has had the sensation in dreams that he was, in fact, floating feet foremost out of the window. The connexion between this and his supposed tapeworms was a little obscure, and though he said the story was of the first importance I would not quite see it. The evidence that he has any tapeworms is meagre in the extreme; they have never been seen, but he has apparently a voracious appetite, he picks his nose, and he passes his motions fairly frequently!

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With kind regards, &c., &c.

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No ova of *Tœnia solium* detected.
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* * *

LOGIC

My better $^{1}/_{2}$
Keeps 2 cows and a calf,
Ducks, poultry, a pig and six sheep,
2 ponies, 3 goats,
Has a field down to oats,
And another in grass for keep.
Since filling up forms can't alarm her,
And since she grows spuds by the ton,
Since my better $^{1}/_{2}$'s $^{1}/_{2}$ a farmer,
I suppose I'm a $^{1}/_{4}$* of one.

* or nearly.

Letters to the Editor

ROYAL MEDICAL BENEVOLENT FUND

—I beg to remind your readers of the President's mas appeal (*Lancet*. Oct. 29, p. 814) as the gifts tributed before Christmas day.

will acknowledge that the winter months are lly difficult and hard for old people living on small es. I therefore ask those who are willing to help nd in ensuring extra comforts and cheer to its beneficiaries to forward their contributions as as possible, marked “ Christmas Gifts,” to the Medical Benevolent Fund. 1, Balliol House, Fields, Putney, London, S.W.15.

C. LUTHER BATTESON
Hon. Treasurer.

HOSPITAL ADMINISTRATORS

—Mr. Hackwood's letter of Nov. 19 demonstrates uncommon confusion between administrative and l staff. Staff engaged on purely clerical duties l be regarded as technicians in their particular ts. They bear the same relationship to their istrative heads as, for example, laboratory techs bear to directors of pathology. The Bromley s apparently classify under the administrative ng those jobs which have an administrative content clerical field, whether central or local, and are thus tly expressed.

the general subject at the heart of Mr. Hackwood's ; one has always looked to the voluntary teaching tal for medical freedom. Such freedom was not ly lacking in the municipal hospitals, and clearly as these hospitals turned towards clinical division. cal freedom (consistent with service good) is still t more important than administrative fancy, but ust know clearly what is necessary to ensure this om. The medical advisory committee mechanism, ing parallel with the system of medical firms—the pattern of the “ voluntaries ”—should at the ent be adequate safeguard; and it is, despite kion to the contrary, completely proof against “ lay mation,” especially with medical representation on ital management committees.

e question should now be asked: is the coexistence) clinical division, (2) the medical advisory committee, (3) the medical superintendent, and (4) medical esentation at management-committee level likely to e clinical freedom? One among these is obviously of pattern, and it must be for the profession carefully onsider which shall go.

the final decision is that doctors shall administer, , logically, they should *completely* administer—hospital and at management-committee level. No etary can demur if this is, after full consideration. to be for the good of the service. But the question les again—would this spell medical freedom? What the clinicians think?

W. J. CRABB.
Secretary, Fulham and Kensington
Hospital Management Committee.

“TEETHING POWDERS”

IR,—It has been suggested that mercury poisoning y be the cause of infantile acrodynia, and that ething powders” are the source of the mercury.[1]

It is difficult to reconcile the history of many cases of rodynia with mercury poisoning, and the proof has so t rested upon the microanalysis of urine. The interest used by this work, however, made us aware that ething powders are very commonly used.

With the help of members of the Kent child-health service an inquiry was made of 100 mothers of children aged 12–24 months attending five different clinics. Mothers of children of this age were chosen because the peak age-incidence of acrodynia is about 10 months, and it was hoped that memories would be long enough to cover the second half of the first year.

The results have been interesting. More than half the infants (53) were given such powders. The most popular powder in use is one containing calomel (48 cases); grey powder was used for 4 infants. Powders were frequently given in the first few weeks of life and continued for months as a weekly dose. The reasons for using powders varied from “ the mother has great faith in them ” to more specific reasons such as “ fretful with teething,” irritability, restlessness at night, sore gums, constipation, or digestive upset. The advice to use the powders was offered 18 times by a grandmother, 18 times by a neighbour or friend, 4 times by a doctor, 3 times by a chemist, and once by a midwife. The families were evenly divided between town and country, and the proportion of powder-users in the two groups was the same. None of the children developed symptoms of acrodynia; as might be expected, the few children reported to be victims of infections and who failed to gain weight regularly, were mostly powder-takers.

Children's Department,
Farnborough Hospital, Kent.

DUNCAN LEYS.

ÆTIOLOGY OF PEPTIC ULCER

SIR,—One can readily agree with the comment in your leading article last week that the evidence brought forward in the same issue by Dr. Doll and his colleagues need not be interpreted as supporting the hypothesis that hypersecretion is the cause of chronic peptic ulcer: but this does not mean that either the opposite view or the suggestion which you have advanced are satisfactory alternatives. It will be generally agreed that the answer to a medical problem should, whenever possible, offer a physicochemical explanation, and one may therefore leave “ autodigestion ” and the “ inborn diathesis ” out of discussion because biologically they are unsound arguments and in any case they only remove one difficulty to replace it by another one.

The fact that chronic ulcer is invariably associated with high acid values has led to the unwarranted generalisation that excess of hydrochloric acid is the only factor in the causation of all types of chronic ulcer. There is no difficulty in accepting the acid factor as the cause of the œsophageal, jejunal, and Meckel's diverticulum ulcers, which belong ætiologically to one category of lesion: but, a priori, hydrochloric acid cannot by itself produce the ulcers situated in the stomach and first part of the duodenum, which belong ætiologically to a different category of lesion. There is experimental evidence to support these theoretical considerations. This distinction in the classification of ulcers is of fundamental importance, for it leads to the inescapable deduction that there must be a second factor in the production of the latter type.

Since hypersecretion always accompanies the active ulcer, it is necessary to define in what relationship they stand to each other. Hypersecretion forms a constituent part of the “ syndrome of hyperfunction ” which embodies the normal reaction of the stomach in response to a stimulus; the persistence of an unusual stimulus produces the exaggerated physiological response which becomes a pathological entity. The syndrome of hyperfunction—which is pathognomonic of the disease—is an expression of a state of irritation which appears as a functional disorder in the period of transition before the establishment of the organic lesion—i.e., it represents the pre-ulcerative stage.

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[1] Warkany, J., Hubbard, D. M. *Lancet*, 1948, i, 829.

In England Now

A Running Commentary by Peripatetic Correspondents

"It takes a fortnight to cure a cold; if you leave it alone it gets better in two weeks." I have just learnt the sad truth of this cynical statement. As I woke up this morning with a streaming cold I recalled a recent article saying something like: "The initial stage of a cold is an allergic reaction which in nearly 98% of cases can be instantaneously cured with antihistaminics." I had only to reach out for the latest sample, and down went an enormous dose. It put me to sleep for several hours but left my cold wide awake. The local chemist tried to be helpful: "A thousand milligrammes of ascorbic acid will soon get rid of your cold," he advised, and made me swallow twenty tablets of vitamin C every few hours. My friend, the physiotherapist, was very sorry to hear that I had a cold. "Some U.V.L. and local short-wave will soon fix it," he pronounced cheerfully and proceeded to treat me with childlike faith and conviction. Home at last, after a busy surgery where the treatment of colds was the main item on the agenda, I placed myself again in the soporific arms of antihistaminics, endured the astringent taste of ascorbic acid, and was just about to try a new vasoconstrictor on my nasal mucosa when my wife said: "Take two aspirins and a hot drink and you'll be cured tomorrow." Tomorrow? From tomorrow it will be only thirteen more days to go. . . .

* * *

The method of writing to the family doctor on the discharge of his patient from hospital is changing. Instead of the informal chatty letter, the modern habit is to despatch a scientific summary, resplendent with biochemistry but stripped of humour and intimate clinical details—a dull document. Fortunately, in acting as scribe (or registrar) to the firm, I have been set a high standard of the older school of writing by my chief. May I give you an example? The professorial hand wrote as follows:

Dear Dr. X,

Thank you for referring Mr. Jones to me; a dear old man, who told me, and I have no reason to doubt it, that he is 86. He opened his story with an account of how, in the earlier part of the eighteenth century, there was a medium who, under suitable condition of trance, would float out of the window feet foremost! Mr. Jones claims kinship with this gentleman, because at certain periods of his life he too has had the sensation in dreams that he was, in fact, floating feet foremost out of the window. The connexion between this and his supposed tapeworms was a little obscure, and though he said the story was of the first importance I would not quite see it. The evidence that he has any tapeworms is meagre in the extreme; they have never been seen, but he has apparently a voracious appetite, he picks his nose, and he passes his motions fairly frequently!

This man, my dear X, is as mad as a hatter. He is suffering, as you say, from senile dementia, and his tapeworms and his floatings out of the window are alike evidence of the state of his mind. Actually, when not obsessed by these episodes he is a very pleasant man, with a good sense of humour, and physically extraordinarily fit. He has, of course, a good deal of atheroma, a large heart, and a blood-pressure of 200/90. Nothing was to be felt in the abdomen or in the rectum, and the prostate is small and firm. He has some infection of his water, which was turbid, but generally speaking he is very well.

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With kind regards, &c., &c.

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Has a field down to oats,
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Since filling up forms can't alarm her,
And since she grows spuds by the ton,
Since my better $^1/_2$'s $^1/_2$ a farmer,
I suppose I'm a $^1/_4$* of one.

* or nearly.

cutive in the factory whom I considered to be in a n to know the true facts; these were stated in my paper.[4]

findings in my last paper [6] enable me to refute Dr. ston's suggestion that the massive lesions are originally ilous. Serial films on several cases published in my show unequivocally the development of massive subsequent to those of a miliary snow-storm type. ure Dr. Heppleston will agree that this miliary form, nown in other types of pneumoconiosis, had nothing ever to do with tuberculosis. There is no evidence now that this miliary appearance may not be due to the tion of silica. Thus, the massive lesions, being a later of the miliary, are also not tuberculous; and in keeping this are my clinical and pathological observations. case reported [6] the patient for some years before his brought up large amounts of black graphite sputum; one time his films showed a rather large cavity within assive shadow.[3] No tubercle bacilli were found in the n which came from this massive lesion, regarded by epplestor as originally tuberculous; and this lesion und at necropsy to be a cyst filled with black fluid. ermore, no evidence of tuberculosis was detected in the of this man either macroscopically or microscopically. eppleston may contend, as he did in his letter, that ng of fibrous tissue is not necessarily indicative of the of free silica, since exactly similar effects may be ced by healed tuberculous foci. Being a physician I to leave the controversy in such matters to the patho-, but I am doubtful whether many experts in the logy of occupational lung diseases would agree with

The second question raised by Dr. Heppleston is whether graphite can produce pneumoconiotic lesions. In my here are manifestations of fibrosis which I am inclined ribute to silica, and others which are mere deposits of ite. These observations are by no means sufficient ide the rôle of pure graphite. This can only be proved orough animal experiments conducted for long periods. is way it might also be shown whether or not tuberculous s are indispensable for the development of pneumosis due to graphite with and without silica. But such iments can provide proof only if the animals have inhaled ite dust. Graphite suspended in oil injected into the via the trachea gives, in my opinion, no conclusive nce.

erculosis Dispensary, Hull. LASAR DUNNER.

ANONYMITY IN BROADCASTING

R,—The report in your last issue that a well-known ician had been televised delivering a talk on his al subject prompts me to draw attention to the tic state of practice with regard to the publication e names of medical broadcasters. I was recently d to broadcast on a subject only partly connected medicine and I was urged by the B.B.C. to allow name to be published. Before answering I sought e. The General Medical Council refuse to advise pecific questions and merely draw the attention of inquirer to their warning against advertising. An ority on professional ethics strongly advised st publicity. "The present embargo," he said, ridiculous and will not be lifted until sufficient rs have defied it; but don't take the risk yourself!" he series of broadcasts in which I took part some ors remained anonymous and some did not.

t will not the G.M.C. at least tell us what they rstand by advertising? The public today seeks ation on medical and allied questions. The B.B.C. aking a serious attempt to supply the need. It is an nature to wish to know who is the authority to m one is listening. Is it advertising if a doctor, out recommending himself in any way, allows ame to be published in these circumstances? And is ir that he should not know the answer until someone plains about him to the G.M.C.?

ay I, Sir, preserve my anonymity and remain

IGNOTUM PRO MAGNIFICO?

B.C.G. VACCINATION

SIR,—I cannot lay claim to much personal experience of B.C.G. but I have had a considerable experience of vaccination with the vole acid-fast bacillus, and it is reasonable to assume that these two avirulent strains act in very similar manner. From what I have seen in a few animals vaccinated with B.C.G. and in many animals vaccinated with the vole bacillus, I believe that B.C.G. vaccination can in fact reduce the morbidity and mortality rates for primary tuberculosis, but what I have seen also makes me firmly convinced that there should be no yielding to any clamour for the general release of the vaccine in this country.

Without entering into the controversy that has arisen over the statistics which have been cited in favour of B.C.G. vaccination, I should like to draw attention to the fact that even if these statistics were generally acceptable as adequately controlled, all they could serve to show is that vaccination can raise the resistance of susceptible subjects for a certain space of time. Any enhancement of resistance following vaccination which is demonstrable over the periods of time covered by the statistics could be due to the direct effect of the vaccination itself. There is nothing to justify any conclusion that the temporary protection given by the vaccination has been converted to something in the nature of a lasting immunity as a result of a fresh stimulation of the defence mechanism by virulent tubercle bacilli gaining access to the tissues.

In the guineapig and in the cow there is a period after vaccination during which resistance to virulent bacilli is notably enhanced; but sooner or later—sooner in the guineapig and later in the cow—resistance falls away to reach, in some animals at least, a level below that observable in any of the control animals. The fact that resistance in the vaccinated animal can fall eventually to a level below that of the unvaccinated animal is disturbing; and it is not peculiar to animals vaccinated with the vole bacillus, for E. A. Watson reported similar findings in long-term experiments with B.C.G. in cattle to the 12th International Veterinary Congress in 1934. It is strange how lightly this worker's results have been dismissed and how the lesson to be drawn from them has been ignored.

From early times we have been taught that man's allotted span is threescore years and ten; yet how many of the adequately controlled statistics advanced in support of B.C.G. vaccination in man cover a space of time approaching even one of these three and a half score? When the differences between the normal life-spans of the various species are taken into consideration, it becomes evident that the periods of time for which statistics are so far available in the case of man are comparable only to those periods of time during which resistance is still enhanced as a result of vaccination in the case of animals. There may still come a time—20, 30, or 40 years later—when there will be a rise in the morbidity and mortality rates for the older age-groups as a late, but nevertheless direct, result of imperfect vaccination in early life.

Far from there being no necessity for further controlled experiments in this country, it would appear to be a moot point whether it is ethical to carry out, under the assurance that the vaccine is harmless, any experiments at all on human beings so long as the various factors underlying infection with, and resistance to, tuberculosis are still too imperfectly understood to justify the use of what might yet prove to be a two-edged weapon.

Nature is conservative in her methods, and while it is true that man has a greater capacity than the lower animals for developing a lasting immunity when exposed to infection with virulent bacilli, his reactions to vaccination with an avirulent strain must be similar to those

It has been shown experimentally that a physical agent is not involved in the production of the initial injury, but evidence is now accumulating that a chemical factor other than hydrochloric acid may be responsible for the primary trauma. But whatever this may be, there can be little doubt that hypersecretion precedes the lesion, and that they are both-produced by the same morbid process and one is not responsible for the causation of the other.

London, W.1. J.-JACQUES SPIRA.

PATHOGENESIS OF ATHEROSCLEROSIS

SIR,—In an investigation, during the last two years, of the problem of aortic atheroma I have had many opportunities of verifying the correctness of the views expressed by Professor Duguid in his article of Nov. 19. It would be a pity, however, if, in recognising the thrombotic nature of most atherosclerotic plaques, we were induced to abandon completely the facts accumulated by the "degeneration" and "overgrowth" schools of thought. The antithetic tendency in the development of medical science is almost irresistible, but true progress is only achieved by attempting synthesis.

The incompleteness of Professor Duguid's explanation, to which he himself draws attention, is best shown by reference to the peculiar distribution of atherosclerotic lesions, which are found in arteries rather than in veins, in certain arteries rather than in others, and in characteristic positions within these arteries rather than diffusely. If thrombosis accounts for the formation of these plaques, clearly there must be factors which predispose to thrombosis in these selected places. The almost invariable reason for the formation of a circumscribed mural thrombus is disease of the underlying arterial wall—disease which usually first manifests itself to the naked eye as a spot or streak of "lipoidosis." This lesion, as Professor Duguid points out, cannot satisfactorily be explained by the thrombotic theory.

The results of my own investigation may not be published in extenso for some time to come, and I would therefore be glad of an opportunity of briefly stating my main conclusions:

> It appears that the human arterial tree is not perfectly adapted to the normal mechanical demands made upon it. This maladaptation is especially pronounced at the sites of maximum mechanical stress. In these places, from a very early age, foci of lipoid degeneration appear, as the result of an absolute or relative excess of plasma constituents. Resorption of these lesions ceases after the age of 25, and thereafter the foci increase in size and pass successively through the stages of fibrosis, vascularisation, and ischæmic necrosis. It is over these lesions—more especially in their necrotic end-stage (when they release thromboplastic substances)—that mural thrombi tend to form, which either in themselves or by their organisation are responsible for most of the clinical effects of atherosclerosis.

These conclusions, based on analysis of 300 cases, combine the views of Rokitansky, Virchow, Anitschkow, Moschcowitz, Winternitz, and Duguid into an integrated picture of this disease-entity.

Professor Duguid's hæmodynamic argument against the possibility of intimal overgrowth is not acceptable. He has succumbed to the myth of the pulse-beat. The pulse as felt in healthy people is an artefact produced by digital compression of the artery. Except the aorta, normal arteries do not contract and expand rhythmically, being kept at a constant calibre by the contraction of the medial muscle. In emphasising the elasticity of arteries, Professor Duguid tends to overlook their muscularity. Intimal overgrowth can and does occur. That the basis of such growth may be an accretion of fibrin with subsequent organisation is interesting and important but does not present a striking departure from the mode of fibrous-tissue formation.

These critical remarks are not intended to from my opinion that, in demonstrating the thro nature of the clinically significant atherosclerotic Professor Duguid has made a contribution of t importance and one which in its therapeutic ap may become the source of the greatest benefit.

Gerontological Research Unit,
Edinburgh University.
ERICH GEIRING

SIR,—Professor Duguid quotes as his example trating the thrombosis hypothesis a thrombosis coronary artery. If this were true, surely one expect evidence of myocardial infarction—na fibrosis—in association with the atherosclerosis. states that "coronary occlusion may occur wi myocardial infarction if the process is slow in dev ment or (and) the collateral circulation is adequ This statement would support the production of com occlusion by atheroma which progresses slowly than by a process of thrombosis. Thus it is diffic believe that if a mural thrombus were formed in an as small as a coronary it would not rapidly increa size and occlude the lumen, producing infar Undoubtedly in cases of adequate collateral circul infarction would not occur, but to prove the hypot one would have to find some correlation between at sclerosis and myocardial infarction—that is, an in pletely occluded coronary artery with approp changes in the myocardium indicating previous com occlusion which became recanalised. However, so atherosclerosis alone is found.

The work of Professor Duguid indicates that formation of atherosclerosis from a mural thromb the method by which a thrombus in the intim organised. May not this phenomenon still be rega as a process which increases the degree of atheroscle previously present rather than acting as a pri cause. It may be possible to correlate these "p logical conditions in which the tendency to thrombo unduly increased" with the severer states of at sclerosis.

Wembley. D. CECIL RABBI

GRAPHITE PNEUMOCONIOSIS

SIR,—In his letter of Nov. 19 Dr. Heppleston dis the pathology and pathogenesis of graphite pne coniosis, which was the subject of a leading articl your issue of Sept. 17. I should like to make following comments.

1. Dr. Heppleston distinguishes two types of lesion graphite pneumoconiosis: (*a*) small lesions consisting small focal collection of black pigment with little fibrosis a distinct focal emphysema; and (*b*) a pigmented ma dense fibrous tissue sometimes showing colliquative necr He regards the massive lesions as infective in nature as far as I understand, basically tuberculous. He justified in applying his findings on coal-workers to grap workers.

In the graphite problem not only the pathological histological findings are important, but also, in my opin the clinical findings and still more the radiological finding serial X-ray films. Your leading article mentions the arti by Gloyne and his co-workers[1] and Harding and Oliver.[2] article mentions only the first of my own papers,[3 4 5 6] that I was the first to publish a report on graphite pneu coniosis. As to the purity of graphite, I was under a apprehension at that time, but not, as you state, becau was misinformed by the workers (whose unconfirmed op I would not have relied on). My information in fact came fr

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1. Gloyne, S. R., Marshall, G., Hoyle, C. *Thorax*, 1949, 4, 31.
2. Harding, H. E., Oliver, G. B. *Brit. J. industr. Med.* 1949, 6,
3. Dunner, L. *Brit. J. Radiol.* 1945, 18, 33.
4. Dunner, L., Bagnall, D. J. T. *Ibid*, 1946, 19, 165.
5. Dunner, L. *Ibid*, 1948, 21, 182.
6. Dunner, L., Bagnall, D. J. T. *Ibid*, 1949, 22, 573.

ng at least 400 toxic exposures to high pressures gen I did not once observe myoclonic movements h arms as the sole symptom of oxygen poisoning. ly subject showing myoclonic movements in one subsequently had a typical jacksonian attack.

lly I would suggest that intermittent oxygen y is far safer in this type of case. Study of the l-blood carbon-dioxide tension, or content, will o determine which patients are in the greatest of carbon-dioxide narcosis.

nte of Diseases of the Chest,
London, S.W.3.

KENNETH DONALD.

—Dr. Davies and Dr. Mackinnon are being misled ir observations on but two cases.

tly, when congestive cardiac failure has overtaken nphysematous subject it is a matter of clinical ation that death may take place suddenly, as in ase 2, even though no oxygen is given. In the l place, when the anoxia is severe clonic limb nents are seen, which disappear in the oxygen nly to reappear out of it. Thirdly, the post-m brain findings, if closely resembling those bed by Hunter,[1] are certainly not the rule in cases physema dying of congestive heart-failure.

ally, the life-saving value of oxygen therapy in poor unfortunates with complicated emphysema oubted, so let us forget about oxygen poisoning.

e Farm Hospital,
ield, Middlesex.

THOMAS SIMPSON.

—The article of Nov. 12 by Dr. Davies and Dr. nnon is of very great interest. We have had lerable experience in this school of studying the nses of emphysematous subjects to oxygen, and ally speaking the reaction is beneficial, oxygen ation of the arterial blood rising with accompanying tomatic improvement. It is admitted, however, it is often impossible to achieve a normal arterial n saturation in an oxygen tent, and there are ions on which the mental symptoms persist ically unchanged.

have observed a few rare instances in which al venous engorgement going on to papillœdema retinal hæmorrhages has complicated the re: the cerebrospinal-fluid pressure in such nts is very high—over 300 mm. water in one case. patient came to post mortem: there was swelling œdema of the brain with widening of the Virchow-n spaces, into some of which recent hæmorrhages taken place. These changes closely resemble those in your contributors' case 2, though the effused d had not yet reached the subarachnoid space. patient (case 3 of Howarth et al.,[2] and also case 3 mpson[3]) had been treated in an oxygen tent mittently over a period of two months before death, he cerebral symptoms were those of steadily advanc- mental confusion and clouding of consciousness, h appeared before admission and which, if little oved, was certainly never made worse by oxygen. e is nothing in the history of this case to suggest the lesions were produced by oxygen therapy.

ach winter brings a dozen or so cases of emphysema rt-failure to autopsy in this hospital, nearly all of m having been treated by oxygen, and the occurrence he lesions in the case here described, so far unique ur experience, seems to be ascribable to some factor er than oxygen therapy. The clinical picture of mphysematous encephalopathy" with papillœdema l high cerebrospinal-fluid pressure may develop ependently of therapy.

The observations of Davies and Mackinnon emphasise the complexity of the problems involved in the cerebral adaptations to emphysema. We shall certainly look forward with interest to their future reports, and meanwhile keep a closer watch for any adverse influences of oxygen administration.

Postgraduate Medical School
of London.

JOHN McMICHAEL
BERNARD LENNOX.

REGIONAL PSYCHIATRISTS' ASSOCIATION

SIR,—At a meeting in London on Nov. 22 it was agreed that an Association of Psychiatrists of the South West Metropolitan region be set up to replace the old psychiatric advisory group of this region. A draft constitution was discussed and approved. It is proposed to send a copy to all psychiatrists working in the region, who will be invited to join the association. The acting treasurer is Dr. D. N. Parfitt, Holloway Sanatorium, Virginia Water, Surrey.

Belmont Hospital,
Sutton, Surrey.

D. SHAW
Acting Secretary.

CONTROL OF TUBERCULOSIS

SIR,—Recent letters emphasise the fundamental dichotomy in the approach to this problem in Great Britain. The basic problem is shortage of beds in sanatoria and hospitals. This, combined with the alarmingly large number of deaths from tuberculosis—400 per week—and the fact that half of these deaths occur within one year of notification, should bring together the tuberculosis officer and the chest physician for a common concerted attack. The tuberculosis officer is primarily concerned with the patient who should go into a sanatorium; but until that happy and usually far remote day, the patient must be kept under observation, and if possible given some form of treatment. Furthermore—and this is of paramount importance—the patient must be made as little a risk to his family as possible. On the other hand, the physician at the sanatorium is interested in curing each patient that comes into his hands, knowing that the risk of infecting others and the patient's family is considerably reduced during his stay in a sanatorium.

It has been suggested by some correspondents that if collapse therapy is carried out in the patient's home with adequate care, on suitable cases, very often the patient's condition can be improved and his stay in a sanatorium considerably reduced. This in turn leads to an increased turnover in sanatorium beds. More important, however, the infectivity of the patient can be reduced, and, as a source of infection, he can be brought under early and adequate control. In blunt terms, it is probably more important to control the patient as a source of infection than worry about complete cure, although a cure must always be the ultimate aim. Awareness of this was the basis for beginning domiciliary collapse therapy in many dispensaries such as those of Bermondsey, Southwark, and Ealing. I had an opportunity of working with Dr. E. K. Pritchard at Southwark, and believe that his results amply justify the method.

In this country Myers, in 1920, faced with the problem of a large number of sputum-positive patients in the community and inadequate facilities for treating them, tackled the problem by: (1) prevention by early treatment of patients of the reinfection type from becoming infectious; (2) isolation of the infectious in the sanatorium or home; and (3) eradication of tuberculosis in cattle. The success of his programme was mentioned in THE LANCET two years ago.[1] Tice,[2] faced with a similar problem, began in 1931 a programme of collapse therapy in the home and of B.C.G. immunisation. He states that "collapse therapy is more perfect and complete than any isolation." He found that the sputum became negative in 83% of patients with minimal disease, 76%

Hunter, A. R. *Lancet*, 1949, i, 1045.
Howarth, S., McMichael, J., Sharpey-Schafer, E. P. *Clin. Sci.* 1947, 6, 187.
Simpson, T. *Brit. med. J.* 1948, ii, 639.

1. Annotation. *Lancet*, 1947, i, 836.
2. Tice, F. *Illinois med. J.* 1946, 89, 280.

of the lower animals. Man's greater resistance to virulent tubercle bacilli must lie in his greater capacity to deal *with the substances which are responsible for their* virulence; and from analogy with other infections it seems fair to assume that these substances are antigens and that man has a greater capacity than lower animals for developing antibodies for these antigens.

Both avirulent and virulent bacilli will produce allergy (to use this term in its widest sense of altered reactivity), but in addition virulent bacilli will stimulate the formation of special antibodies. It is important, however, to realise that in infection of an unvaccinated person with virulent bacilli, *antibody formation must be* a phenomenon which proceeds concurrently with, and not in succession to, the development of allergy. The development of allergy cannot be regarded as a stage towards the development of antibodies. In fact, in a vaccinated person the multiplication of virulent bacilli is held in check and therefore less antigen will be available *for the stimulation of antibodies.* There is a *grave risk* that, for the sake of the few who have so little resistance that they cannot survive a primary infection, the future of the many, who could have overcome the primary infection in a perfectly adequate manner, may be endangered.

Further research there must be before vaccination can be adopted as a rational procedure, but let it be intensive and coördinated research attacking the problem from all angles simultaneously. We must learn more about the development of allergy, and we must learn more about the antigenic properties of various bacterial fractions. If the latter cannot be studied in the usual serological manner, there are still the possibilities of tissue-culture to be explored. Above all, the physiological basis for natural resistance must be sought; for herein lies the key not only to prophylaxis but also to *treatment.*

Institute of Animal Pathology,
Milton Road, Cambridge.

JAMES A. YOUNG.

MEGAMYELOID CELLS AND AMINOPTERIN

SIR,—In the bone-marrow of mice during acute intoxication produced by large doses (20 mg. per kg. *body-weight daily for three days)* of 'Aminopterin' (4-amino-pteroylglutamic acid, kindly supplied by the Lederle Co.), we have observed, in addition to the almost complete disappearance of the granuloblastic, erythroblastic, and megakaryocytic series, the appearance of large myeloid cells with a budding nucleus. Similar polyploid cells have been observed by us in acute poisoning by benzol[1] and mustard-gas derivates,[2] but in animals treated with aminopterin they are more characteristic and frequent.

These cells have the following characters: (*a*) large size (their dimensions being sometimes those of mature megakaryocytes); (*b*) irregular shape of the nucleus; and (*c*) fragility (these cells often have ravelled borders and many cytoplasmic and nuclear vacuoles).

These large myeloid or "megamyeloid" cells represent various types of myeloblastic, promyelocytic, or myelocytic gigantism. Probably these elements are produced owing to the underlying disorder of the division process of the myeloid cells; they are perhaps the *ultimum moriens* of the granuloblastic source of the bone-marrow.

Knowledge of such megamyeloid cells in extreme experimental conditions should make easier the interpretation of *similar cells described in cases of aplastic* myelosis and acute or subacute aplastic leucosis.

A. BASERGA
G. MARINONE.

Medical Clinic, University of Pavia.

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[1] Baserga, A. *Boll. Soc. med.-chir. Pavia*, 1931, 45, 399.

[2] Baserga, A., Marinone, G. *Sang*, 1948, 19, 381; *Hæmatologica*, 1949, 33, 299. Marinone, G. *Sang*, 1949, 20, 497.

LIST OF AWARDS AND GRANTS

SIR,—We have in preparation a reference book particulars of the scholarships and other financial which are available for medical training or Every medical school and university in the coöperating in supplying material together with number of schools and charitable organisations. awarding body may have been inadvertently *and it is clearly important that the reference book* be as complete as possible. If, therefore, any of readers knows of an award or grant for medical or research, particulars of which have not alre been supplied, I should be grateful if he would communicate with me.

British Medical Association,
Tavistock Square,
London, W.C.1.

JOHN PRINGLE
Public Relations Offic

NEUROLOGICAL EFFECTS OF OXYGEN

SIR,—I have read with *great* interest the artic Dr. Davies and Dr. Mackinnon in your issue of Nov and I would like to make a few comments.

A number of workers (Barach, Richards, Cour Comroe) have described the syndrome of carbon-di narcosis when oxygen is administered to patients chronic lung disease, arterial anoxia, and car dioxide retention. Recently I studied such a pati with severe emphysema and mild heart-failure, lapsed into coma after 12 hours' oxygen therapy. this time his arterial pressure of carbon dioxide (pC was 120 mm. Hg. After the withdrawal of oxygen recovered rapidly with an abrupt fall in his arte pCO_2. It was indeed a strange sight to see him beco almost black and then recover consciousness. Se weeks later, when the pulmonary infection for which was being treated had subsided, the arterial pCO_2 beca *steady at 60 mm. Hg.* It is thought by some carbon-dioxide retention will remain more ma after such an episode.

The most favoured theory concerning this syndr is that these patients are so well *buffered* that they relatively insensitive to carbon dioxide (Scott), and th their respiratory activity depends mostly upon ano *stimulation* of the *sino-aortic* zones The removal the anoxic stimulus causes them to hypoventilate further retention of carbon dioxide. It can be e verified that many such cases do greatly decrease ventilation when breathing oxygen. Barach and Rich (personal communication) have tried to count the respiratory acidosis in such patients during oxy *therapy* by exhibiting ammonium chloride, but procedure upset them even more.

Kety and Schmidt have demonstrated the very lar cerebral blood-flow in severe emphysema. They assum that this is due to cerebral vasodilatation caused by high body pCO_2. This increased blood-flow may ca excessive production of cerebrospinal fluid (C.S.F. When a raised venous pressure is also present, then th may also delay absorption of C.S.F. *If the body* pC rises shortly after the commencement of oxygen breathin then the further vasodilatation will result in an increas quantity of blood *in* the cerebral circulation, an a rise in C.S.F. pressure will follow from mechanic causes alone, the cranium acting somewhat like plethysmograph.

I cannot agree that oxygen poisoning, as usuall described, should be incriminated. Campbell's expe *ments showed that* there is only a small rise in th *tissue carbon-dioxide* tensions when *normal* animal breathe comparable percentages of oxygen *for* ver long periods; and in any case the sharp difference between oxygen poisoning and carbon-dioxide intoxic tion makes Gesell's theory *unconvincing.* Furthermor recent research has not supported his thesis. Whi

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ell Hall Sanatorium, Sussex. RUTH DINGLEY.

IMPROVISED MECHANICAL RESPIRATOR

—The following account of an improvisation to
protracted treatment and nursing in a box-type
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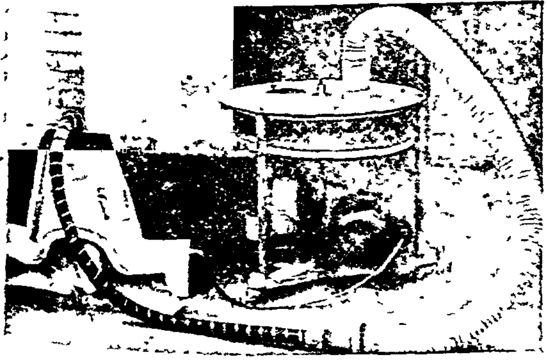

With this problem in mind, and having read Dr. Ursula Blackwell's article in *The Lancet* of July 16, 1949 (p. 99), the patient's father, who is connected with the Coventry engineering industry, and one of us (J. F. G.) visited the Western Hospital, Fulham, where they were kindly allowed to inspect the hospital's comprehensive collection of mechanical respirators. In particular from their Stille respirator we acquired the basic idea of a rigid suction chamber sealing over the patient's trunk, and we noted how the Stille shield had been adapted by the hospital staff with a Both motor and bellows unit. The father then set to work, with the help of a firm of pattern-makers, to construct a wooden mechanical respirator that would (1) fit over the chest and upper half of the abdomen only; (2) leave the limbs free; (3) fit over the respirator mattress so that the patient, having been drawn out, could yet remain secure in the Both respirator attachments, and if anything went amiss, could be promptly sealed up again in the box respirator in a matter of seconds; and (4) work off the box-respirator motor and bellows unit. A rubber valve and manometer similar to the Both were also planned to be fitted.

The sealing of the respirator round the patient to make an adequately airtight junction was the greatest single difficulty. It was solved by two devices: (1) The new respirator was made to measure, both to the patient and to the Both respirator mattress. Malleable lead strips were quickly moulded round the upper part of the chest, the axillæ, and the middle of the abdomen to obtain the relevant silhouettes. (2) A thick layer of 'Sorbo' rubber was fixed to those margins of the respirator which fit on to the patient. The sorbo was found to be appreciably porous to air, so, to overcome this, thin rubber aprons were fitted to the inside of the new respirator and carried round the sorbo. The free edge of this rubber sheeting, when tucked round the patient, assisted the sealing. This seal was completed by several pads of cotton-wool and (underneath) by the sorbo mattress supplied with the box respirator. The rubber bedpan, on which the patient lies, is removed when the patient is in the new respirator. To ensure that the respirator worked, and to make adjustments, experiments were made with a volunteer about the same size as the patient.

The respirator (see figure) is used daily for about twenty minutes, during which period the patient has massage and passive movements. The longest time the new respirator has so far been in use is half an hour, but there seems to be no reason why it should not remain on for very much longer, given full psychological tolerance. Unfortunately. this is not yet forthcoming, partly because the patient feels safer in her box respirator, and partly because she associates the new respirator with a degree of pain and discomfort inseparable at present from her passive movements. There is also a sensation of pressure across the abdomen when the respirator is working efficiently, especially during the phase of greatest suction.

The new respirator can be applied effectively in a few seconds by a minimum of four persons, but the patient must be lying squarely and centrally on her sorbo mattress, and the operators improve with practice. Of the four persons, two handle the respirator, one manages the arms, and the fourth attends to the hose and bellows. The respirator works well, but rather more suction is needed (18–20 cm. of water) to maintain the patient's colour than in the box respirator (14 cm. of water), possibly because, owing to its shape and limited size, of moderately advanced cases, and 68% of advanced cases.

It should be possible to carry out in Great Britain a programme similar to these in America, and in this respect the mobile X-ray unit and operating-theatre proposed by Dr. Hoffstaedt[3] would be invaluable. Collapse therapy could be instituted in the home after adhesion-section in those cases requiring it; and the patients could continue to be nursed there. Mobile mass miniature radiography units could be used to pick up the early cases.

The sanatorium physician must be prepared to accept cases that have had home treatment until the "early" cases, likely to respond to a sanatorium regimen, are the only ones claiming admission. Coöperation in carrying out the programme as outlined would soon lead to a decrease in the number of notifications of tuberculosis and ultimately to a fall in the death-rate.

Graduate School of Medicine,
University of Philadelphia.
KENNETH MARSH.

SIR,—Tuberculosis is by far the most serious disease affecting our community, but any campaign against it is liable to fail if physicians themselves do not agree on the methods to be adopted. In the present situation all possible means of obtaining treatment for patients should be employed, whether sanatorium or domiciliary. At a time when patients must wait anything from 8 to 12 months for a bed, sanatorium physicians should not demur at receiving them with some form of collapse therapy already in progress. In the long run the patient who has to wait a long time for admission gains by early collapse therapy in his own home, and it reduces the period he will need in sanatorium when admitted.

Little has been done, however, to organise domiciliary management, and meanwhile it appears that we are still fighting a losing battle. In December, 1944, in England and Wales, there were some 4000 cases awaiting admission to hospital; but by December, 1948, the waiting-list had risen to 9000, and I suspect that it will be over 10,000 by the end of this year. In the same period there has been little change in the number of beds available for tuberculous patients.

I see nothing for it but to bring tuberculosis back once more into the general hospitals where it belongs. In this way not only would the teaching of students in early diagnosis be greatly facilitated but the nursing of the cases would also be eased considerably. Is it not the isolation of the tuberculosis sanatoria, and the conception of the work as rather monotonous and lonely, that prevents more nurses taking up this type of service? Furthermore, beds in general hospitals, under the direct supervision of the chest-clinic physician and where a thoracic surgeon is available, can be used in conjunction with domiciliary management far more economically, and serve a far greater number of patients, than can the same number of beds in a sanatorium. The ever-to-be-desired aim of one physician looking after a case from diagnosis to rehabilitation can be achieved in this way as in no other. The over-all problem in a given district can never be appreciated by the sanatorium physician as fully as by the chest-clinic physician who watches the waiting-list and sees the many new cases diagnosed. In a sanatorium there will obviously be a tendency to keep cases longer than would be absolutely necessary were the sanatorium physician able to continue his treatment in the patient's own home.

Also there is a very natural feeling among experienced sanatorium physicians that domiciliary collapse therapy is dangerous, particularly when undertaken by physicians with inadequate training and facilities. To a certain extent of course this is true; but it is a sad reflection upon a system whereby physicians carrying out tuberculosis work in clinics have always been graded at a somewhat lower level than general physicians or torium physicians—a state of affairs which perpetuated if action is not taken to make the s the chest-clinic worker equivalent in grade and to that of other specialists. If clinics are staffed keen well-qualified and well-trained men, there is reason why the work done in them should not be every way comparable to that done in our better toria. Not only can it be so but it must be so; for are facing a crisis, though this has hitherto been lar disregarded not only by administrators but by members of our own profession.

It is time that the tuberculosis service ceased to considered of lower grade than other specialist servi Instead of a gain in efficiency under the N.H.S. we a fantastic dichotomy by which the key worker in chest clinic is responsible to two or even three mas while at the same time an unduly high proportion of workers has been denied consultant status. Furtherm when the Minister sets up an Advisory Committee Tuberculosis we find that no practising chest- physician is included in its members.

It has been said that the new allegiance of the clinic physician to the regional hospital board dimin his domiciliary interests, and that he may there neglect the public-health side of this important "soc disease. Actually there has never been so m domiciliary visiting and such a keen interest in the so background of the tuberculous patients as is now evid But if we are to continue to tackle the greatest prob facing British medicine in the present desultory fas it may well be that a catastrophic rise in the incidence mortality in tuberculosis will occur. This is made the more possible by our becoming an ever susceptible nation, as indicated by the fact that 60% of school leavers in the Greater London area now Mantoux-negative. When this is considered ag the background of our acute housing shortage and consequent forced contact of susceptible youngsters infectious cases it is no longer surprising that we in our present position. Drastic national action Governmental level is urgently required—if necessary the expense of the care of other diseases of less importa to the community.

PETER STRADLING
Chest Physician and Lecturer in Tubercul
Postgraduate Medical School of London.
Hammersmith Chest Clinic, London, W.12.

SIR,—The aim of this letter is twofold: to try enlist the help of the school medical services in detec tuberculosis in school leavers, 16–18 years of age, to urge intelligent coördination of tuberculin testing and radiography for these young people. text, I take a girl and a boy recently admitted to sanatorium with advanced tuberculosis, neither of th known contacts.

The girl had a routine examination at the beginning of year in the VIth form, and no check-up to discover wh her cough and fatigue in the summer term were due solely examination stress. She left, and undertook library but as it was for a year only and not as a permanen no medical examination was required—since, ironic seems to be the superannuation purse that really The boy, who attributed his weariness to the burden of head boy at his boarding-school, had no routine examination, and his illness was only discovered when a radiography unit visited the factory where he was w in his college vacation.

School doctors may well have excellent (other than that of detecting tuberculosis) for their final examination at the beginning rather at the end of the VIth form year. But would it not possible to arrange that before the boys and girl to the greater freedom and more limited supervision work or student-life, they should all be tuber tested, and that the positive reactors, only, be X-ra ot think it would impose an impossible burden school doctors. To skin-test a batch of people a very formidable or lengthy business, and it ot actually be done by a doctor though perhaps she should read the result. The task of inter- the films of the positive reactors would not fall school doctor.

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[3] Hoffstaedt, E. G. W. *Lancet*, Oct. 8, p. 672.

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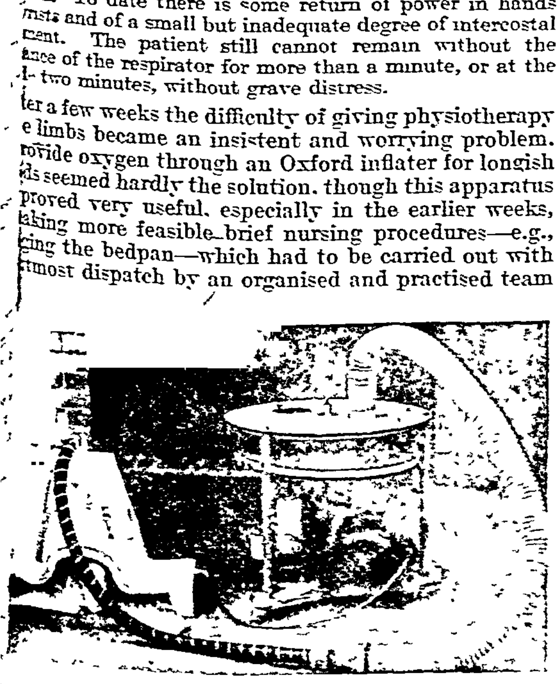

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The sealing of the respirator round the patient to make an adequately airtight junction was the greatest single difficulty. It was solved by two devices: (1) The new respirator was made to measure, both to the patient and to the Both respirator mattress. Malleable lead strips were quickly moulded round the upper part of the chest, the axillæ, and the middle of the abdomen to obtain the relevant silhouettes. (2) A thick layer of 'Sorbo' rubber was fixed to those margins of the respirator which fit on to the patient. The sorbo was found to be appreciably porous to air, so, to overcome this, thin rubber aprons were fitted to the inside of the new respirator and carried round the sorbo. The free edge of this rubber sheeting, when tucked round the patient, assisted the sealing. This seal was completed by several pads of cotton-wool and (underneath) by the sorbo mattress supplied with the box respirator. The rubber bedpan, on which the patient lies, is removed when the patient is in the new respirator. To ensure that the respirator worked, and to make adjustments, experiments were made with a volunteer about the same size as the patient.

The respirator (see figure) is used daily for about twenty minutes, during which period the patient has massage and passive movements. The longest time the new respirator has so far been in use is half an hour, but there seems to be no reason why it should not remain on for very much longer, given full psychological tolerance. Unfortunately, this is not yet forthcoming, partly because the patient feels safer in her box respirator, and partly because she associates the new respirator with a degree of pain and discomfort inseparable at present from her passive movements. There is also a sensation of pressure across the abdomen when the respirator is working efficiently, especially during the phase of greatest suction.

The new respirator can be applied effectively in a few seconds by a minimum of four persons, but the patient must be lying squarely and centrally on her sorbo mattress, and the operators improve with practice. Of the four persons, two handle the respirator, one manages the arms, and the fourth attends to the hose and bellows. The respirator works well, but rather more suction is needed (18–20 cm. of water) to maintain the patient's colour than in the box respirator (14 cm. of water), possibly because, owing to its shape and limited size, chest and abdominal movements are less comprehensive in the new respirator. It is important for the patient not to have a full stomach when the new respirator is applied; omission to take this precaution seems to lead to cyanosis and nausea. Presumably in the patient's prone position the stomach lies high and is forced upwards against the diaphragm by the closely fitting respirator.

Unless enough spontaneous respiration returns in the near future to make mechanical aid unnecessary, our ultimate aim is to wean the patient from the box respirator into the new respirator. Once this stage was reached she could be transferred to a bed suitably adapted, and this would be a great encouragement to her.

It remains to praise the parents' resource and perfect coöperation, and to say that nothing could have been achieved without the constant assistance of Miss H. O'Sullivan, the sister in charge of the ward, the night sister, and all the other nurses who have handled the patient.

J. F. GALPINE
J. W. BROWN.

Coventry Isolation Hospital.

MEDICAL BIOPSIES

SIR,—In your annotation of Nov. 19 Dr. Bodley Scott is quoted as saying that aspiration biopsy of lymph-nodes "will avoid the full operative panoply which surgeons deem necessary for excision of the smallest and most superficial lymph-node." The reader must assume that you have quoted correctly, and I am afraid that the tone of Dr. Bodley Scott's statement, coupled with his eminence as a physician, may lead some of the younger surgeons—or even a rash young physician, if such a contradiction exists—to proceed to the removal of a lymph-node without appreciating the possible danger to the patient. Surgeons are only too apt to remove nodes before hæmatological and serological examinations have been completed, but speaking as a pathologist who has seen what can happen, I would commend wholeheartedly the surgeon who approaches this operation seriously and with every precaution taken.

It is no doubt Dr. Bodley Scott's misfortune to have a jesting remark, probably made with a smile at some surgical friend, quoted as if it were a considered opinion. Indeed, his interest in needle biopsy is certainly due to his full appreciation of the seriousness of this sometimes too lightly undertaken operation.

A. C. LENDRUM.

Dundee.

IRON POISONING

SIR,—May I offer a footnote to your leading article of Nov. 12 about iron poisoning? To avoid further tragedies, it is necessary that not only the patient who handles the tablets, but also the doctor who prescribes them, should be aware of the danger. The manufacturers of the proprietary ferrous sulphate tablets ('Fersolate') taken in the New Malden case print a warning on the container, but there is no such warning on the container in which the pharmacist issues the tablets on prescription. In this case the practitioner was consulted within five minutes and again after an hour and a half, and said that there was no danger and that the infant would be all right. Replying to questions at the inquest about the need for more attention, he said "If, as I thought, the tablets had contained no more than ferrous sulphate, it would not have been necessary." The pathologist said that previous fatalities had occurred from ferrous sulphate, but this was "perhaps not generally known." The coroner summed up, naturally, that "iron and iron sulphate were not generally regarded as poisons; it was not generally known, even perhaps among doctors, that fatal poisoning could occur." If this is so, more inquests seem probable.

HENRY PORTER.

West Wimbledon.

MATERNAL OBESITY

SIR,—Dr. Sheldon's article of Nov. 12 is of
interest to me. I know of two sisters who de
lipodystrophia progressiva after strenuous ef
weight-reduction. The younger, in whom the sign
first noticed about the age of 23, became pregnant
she was 34 and this brought about a redeposition
in the affected areas. I have been unable to tr
reference to the effect of pregnancy on lipodystro

R. N. HER

Grays, Essex.

THE DOCTOR'S CREED

SIR,—May I, as theological student and doctor,
out the weakness of Professor Platt's position
cannot accept the Christian creed, because God to
evil.

Is this not analogous to the situation of a s
presented with signs and symptoms suggesting a
citis? According to how these add up, he will ope
he will not. If he operates he sees for himself
does not, the death of the patient may also tell hi
could escape the issue by saying "As I do not kn
this patient has appendicitis, I will not operate
he would still be unable to escape the effects
decision.

Either God exists or He does not. He claims
revealed Himself in Nature, in the Old and New
ment, and in the person of Jesus Christ. A s
these three leads us to believe that God and C
exist. As in the case of appendicitis we can
absolutely sure, but there is sufficient evidence
us to believe, just as the evidence before the su
sufficient to lead him to operate.

If we believe, then our own lives must change,
our words and example we shall influence others.
not be too late to build a world in which Love,
and Brotherly Kindness predominate. If we
believe, what check is there, or need there be,
putting ourselves first and striving to further
by fair means or foul? "Life is short and we a
time dead." Since 1918 there has been a gradual
into practice of the latter formula—we see th
today.

GORDON S

Wigmore, Kent.

SIR,—Professor Platt is wrong when he write
must either believe that (God) is powerless to i
against the evils of Satan and of man, or that th
His own creation," unless he is restricting the u
word "power" to miraculous intervention
Laws of Nature. It is this meaning of the Powe
that the scientist is led by his training and expe
reject, but there is another kind of power.

If God has created man with free will (the p
of which Professor Platt appears to admit) t
between responding to His will or to that of S
are engaged in a momentous struggle of the will
and our highest fulfilment is to be found in obe
the will of God. If God is true to His stake in
will only give help in the sphere of the spirit
who freely choose to seek it, we need not be
at evils on the material plane which may stem
or indirectly from our ignorance or choice of
can seek to fight these evils, drawing strengt
spirits from God, without expecting miraculous
tion, except for "miracles" of the spirit, such a
are so often privileged to see when suffering is
accepted and overcome. In this way, the powe
may be seen to be more powerful than that of
very real way.

If, on the other hand, God has retained the
intervene miraculously on the material plan

is gaining the advantage. man's struggle becomes gless. for the ultimate issue would never be in

As one who tries to be a Christian it is just here am most perplexed: for the Church seems to me h the reality of such miracles. and thus proposes compatible properties of God—omnipotence. ence. and benevolence—to which Professor Platt ost scientists object.

heologians and scientists could meet each other metaphysical field, they might find it easier to r the Archbishop of Canterbury's plea to work er and understand one another in the ethical and al fields in which their coöperation would be so tial.

rn, Penarth, Glam. C. M. FLETCHER.

—When, after years of labour and anxiety, we are to that upper room to receive our diploma, do we scribe to that Oath of Hippocrates, born in Cos 460 B.C.? Surely our standard of professional ct and our relation to our fellow men was laid before Christ, Mahomet, or Buddha.

fessor Platt has been brave enough to propound edo. I venture to advise his critics to live and live.

rne, Dorset. JOHN WHITTINGDALE.

—May I, very humbly, set out my working hesis?

ave rejected Christianity because of its geocentric cer. Contemplation of the stars in their courses s it impossible for me to believe that this is the planet on which life exists and that the Creator is ned only with the fate of man.

tribute to him infinite power, infinite intelligence, definite purpose. So far as this earth is concerned manifested in the evolution of a being whose mind s with the passage of the millennia and who becomes and more capable of dominating his environment. hat ultimate end I conceive there is no evidence.

the development of life on this planet the vegetable nimal kingdoms arose. The animals are divided into edators and the vegetarians, and a few of the larger mals—of which man is an outstanding example— g to both sections. Further, animals are either rious or solitary, man belonging to the former class. since he is omnivorous too, he is found to have in respect an almost unique position among higher mals. The predatory animal is selfish and ruthless. gregarious shows a greater or less amount of altruism. hypothesis is that in man there is conflict between the shness of the solitary flesh-eater and the altruism he gregarious, and that this clash between fundaal instincts is the reason for most of the world's resses. Flesh-eaters are not all solitary—witness wolves—but in the main I think the distinction is good.

e disposition of an individual depends on the balance inherited instincts and on his upbringing and later ronment. To the altruist—and that he may contly follow the Golden Rule is his highest aspiration ght and wrong are clearly differentiated and he feels me when he does not obey the dictates of his inherited tinct—conscience. To the predator right and wrong e different connotations and he simply does not erstand why the altruist should blame him and empt to circumscribe his liberty of action.

Is all this too simple to be true? It may well be so: t I derive from it a (to me) rational explanation of e present scheme of things. And so I reject with fessor Platt the conception of the benevolence of the eator and believe like the Preacher of old that Time d Chance happeneth to us all.

NESCIO.

SIR,—As doctors we all play a losing game, for ultimately death claims each patient. To relieve anguish of body and mind is the earnest desire of us all, but how infinitely better it is to relieve anguish of soul.

Having myself at one time greatly feared death, and having had that fear removed and replaced by an abiding peace of heart through coming to know Jesus Christ as my own personal Saviour, it has been a humbling and thrilling experience to be able to help men and women on their death-beds to find that same Saviour and to see peace reign where fear had held sway. Furthermore, having experienced defeat by sin in my life and having had that defeat changed to victory by the same Living Saviour, what a privilege it has been to help patients to find the same power through Christ.

I have numerous medical friends who have had similar personal experience to myself and who are similarly helping their patients to share it. What further proof need we of the goodness of God?

Wool, Dorset. T. B. L. BRYAN.

SIR,—One of your correspondents says that "Man may practise virtue or vice as he chooses. He may select deliberately (not by instinct) and follow any line of action from among many." Yet all the evidence patiently collected over the past seventy years or so goes to show that human conduct, far from being deliberately planned by a process of conscious reasoning, has its motivation very largely in the unconscious. We may explain away our behaviour very ingeniously by rationalisations which we have become adept at by long practice, but the true motives of our behaviour are rarely known to ourselves.

Glasgow. L. N. COOK.

SIR,—After the prominence you gave the Archbishop of Canterbury's speech I have rejoiced in Professor Platt's reply, because even today it requires considerable moral courage to state views contrary to accepted religious dogmas. Beyond that courage, the prerogative of intellectual leaders, it also showed Professor Platt to be a man of universal sympathy and comprehension.

Of the other letters Dr. Crichton-Miller's rightly emphasised the division which should exist between the priceless, ageless wisdom which found expression in religious literature and which is part of our cultural heritage, and the dogma itself, formulated by the desire to penetrate and placate the unknown, by fear and by ignorance.

Our world today is so eminently man-made that, although we were not the original creators of it, our first duty ought to be to be responsible for it. For education in general our aim ought to be to create individual and collective responsibility, not to shelve it. The cheerful acceptance of 6 million dead for some supposed sin that we don't know of, but which God has explained, may not prevent one from being a good Christian; but it most certainly bars one from responsible citizenship.

As for the cultural and moral gems which abound in religious literature, I believe it should be read, taught and enjoyed as other works of art at an age when credulity and the desire for literal truths has been tempered by a grain of experience, and then let everyone take as much as he can comprehend or digest. Then these two worlds would rightly have nothing to fear from one another.

Romford. H. SYMONDS.

SIR,—The query from Olim is answered by St. Paul in Romans 8. 18–25. Human suffering is there seen as an epitome of the suffering of all created beings and the redemption of the former holds out hope for the redemption of the latter.

Liverpool. CREDO.

SIR,—Most of the letters in reply to Professor Platt's admirably clear and balanced one of Nov. 5 are examples of the foggy thinking which some members of a scientific profession allow themselves when dealing with a non-scientific subject. One, for instance, doubts the possibility of considering as criminals the doctors who took part in the degrading bestialities of Auschwitz and Buchenwald. "What is right and what is wrong?" he asks. Surely even the Hippocratic Oath might give him, as a doctor, some clue. (It is unlucky for him that Hippocrates was a pagan: not a hope of proving his "Christian inheritance.") Others appear to feel that God is to be applauded for allowing man to exercise free will at Auschwitz and Buchenwald: if free will involves inflicting torture, that is just too bad; the principle is all that matters. Another remarks that if he cannot believe that God is "omniscient, omnipotent, and wholly benevolent," then Professor Platt must be an atheist.

And so it goes on: letter after letter, praising the spiritual value of suffering, and the importance of evil (without which "Christianity would be totally unnecessary"). The whole horrifying correspondence seems to me to have one merit: it is an excellent argument for atheism.

Edgbaston, Birmingham. CONSTANCE BACHTIN.

SIR,—May I reply to Professor Platt and at the same time gently chide my Christian colleagues who think that Christianity is the sole repository of the knowledge of God and of the forces arrayed against the evil of this world? The idea of the omniscience and omnipotence of God is derived from Abraham, who postulated Him as the creator of the universe. It was Moses who emphasised that man is endowed with free will to choose between good and evil, and moreover that good was rewarded and evil punished! Hitler chose Buchenwald and Auschwitz, and many "Christian" Germans chose to carry out his bestial wishes. The "divine" purpose behind this unparalleled exhibition of wickedness is to demonstrate that Christianity has not civilised the Germans and that greater efforts are still needed to civilise man and raise him from the level of the animal. The people who died in the gas-chambers were martyrs who should stir the conscience of every decent individual. The children who die of leukæmia and nephritis stir the conscience of doctors to whom is given the honour of eradicating their martyrdom. When I was a student, I saw patients die of pernicious anæmia until Minot and Murphy discovered the efficacy of liver extract. And so we look forward to the discovery of the cure for cancer and the other at present incurable diseases. No-one knows why the whole of knowledge was not given to us at once, but we can recognise right strivings from wrong and join with our agnostic friends who derive their hope and help from other directions, to achieve happiness for mankind.

Hull. L. I. HARDY.

SIR,—At times, especially recently, I have felt inclined to doubt the mission of our profession; it has seemed that we are all at sixes and sevens, with our eyes fixed only on the main chance. The correspondence in your journal, inspired by the Primate's message to Birmingham medical students and Professor Platt's comment on this, has resolved such doubts and I now feel that I can boast again that I am a citizen of no mean city. May we have "The Doctor's Creed" reprinted in toto, for surely it marks a very great occasion. It must be the first time that the medical profession have spoken with such unanimity, and it cannot be mere chance that this startling profession of faith comes just at a time when the discord among theologians is being so painfully revealed in a similar correspondence in the *Times*.

PAUL GIBSON.

** This correspondence is now closed.—ED. L.

Parliament

Progress of Bills

IN the House of Lords on Nov. 22 the National H
Service (Amendment) Bill was considered on Repo
The Royal Assent was given to the Nurses Bi
Royal Commission in the House of Lords on Nov. 2

QUESTION TIME

How much are we Eating?

In answering questions Mr. JOHN STRACHEY, Minis
Food, said that for the whole of 1949 it was estimated th
per-capita consumption of fats, eggs, cheese, milk, te
bacon expressed as a percentage of pre-war consumption
be as follows: fats 98%, eggs 91%, cheese 110%,
49%, tea 87%; liquid milk 157%. These figures d
include the recent increases in the tea and bacon r
The latest calorie figure available—for the year end
June—was 2980 calories per head of the population p
which was not significantly different from the pre-war
of 3000 calories per head per day. The figures for the
rate of consumption, when they became available, mig
prove to be a significant number of calories abo
pre-war figure.

Research into Rheumatic Diseases

Colonel M. STODDART-SCOTT asked the Lord Presi
the Council what medical research was being done
Medical Research Council into the problem of the trea
cure, prevention, and cause of rheumatism, which affe
most 2 million of our people; and if he would state the
employed and the money expended yearly on this rese
Mr. H. MORRISON replied: The Medical Research
has a research unit which is at present wholly devoted
study of acute rheumatism, and they are making sub
grants for the support of research on rheumatic dis
various hospitals. In addition, they support much
fundamental problems of endocrinology such as led in
to the discovery of Compound E ('Cortisone'). The
expenditure by the council on these and allied proble
increased greatly since 1948 as a result of the new a
to the problem made possible by this discovery. E
ture by the council on research limited to rheumati
£1135 in 1946–47, £3800 in 1947–48, and £4810 in 19

Reduction of Doctors' Lists

Mr. JOHN RANKIN asked the Secretary of State for S
what steps he proposed to take to reduce the maximum
of patients on a doctor's list from 4000 to 3800 or some
smaller number.—Mr. ARTHUR WOODBURN replied:
arranging to explore this possibility with the profe
Scotland.

Shortage of Army Medical and Dental Offic

Mr. T. L. COLE asked the Secretary of State for W
was aware that the negligible entry into the Army of
and dental officers made it difficult to maintain a sati
standard of efficiency in those branches of the Service
steps were being taken to make conditions of servi
attractive; and if he would increase the present
emoluments received by medical and dental officers
Army, which compared unfavourably with those of
in the National Health Service.—Mr. MICHAEL S
replied: The present shortage of medical and dental
in the Army is well recognised. A joint investigati
the problem is being made by the three Service depa
with the Ministry of Defence.

Sickness Benefit

Sir WALDRON SMITHERS asked the Minister of
Insurance if the excessive resort to doctors in the
Health Service had been reflected in an excessive nu
claims for sickness benefit.—Mr. JAMES GRIFFITHS
Close comparison with the estimates in the Gove
Actuary's report on the Bill will not be possible until a
statistical material is available. Several special i
have, however, been made and the information a
gives me no reason to think that either the number or d
of claims to sickness benefit are in excess of what was e

Capitation Fees

Sir ERNEST GRAHAM-LITTLE asked the Minister of
if he was aware that the capitation grant varied
14*s*. 9*d*. and 17*s*. 10*d*. in different areas; and what w

for this variation.—Mr. ANEURIN BEVAN replied: pitation payments in executive-council areas vary ng to the amount of the local practitioner funds are proportionate to the number of persons on doctors' each area plus one-third of the number not on doctors' ere) and according to the first charges which are m these funds. The method of distribution has been with the medical profession.

Operation Hours

-Colonel D. L. LIPTON asked the Minister of Health m and in what hospitals orders had been issued limiting of operating-theatres to the hours 9 A.M. to 5.30 P.M.—VAN replied: I am making inquiries.[1]

-Colonel LIPTON: Does the Minister's reply mean rd Horder has not yet had the courtesy or the courage stantiate the allegation—(cries of "Order")—which absence of factual supporting evidence will be regarded sponsible and, possibly, even malicious? Mr. BEVAN: as I can make out—and I have made inquiries—we ceived no information whatsoever from Lord Horder before or since he made his statement.

SPEAKER said that the supplementary question was an on a member of the House of Lords and it should ve been made. It referred to a statement made in the nd there was no need in the question to mention any at all. Hon. Members: Withdraw. Mr. BEVAN, oint of order, said the statement was made by a member House of Lords but not in his capacity as a member House of Lords. Could a Noble Lord make any statehe liked in any other capacity and claim immunity? PEAKER: It was a very offensive supplementary on imputing malice and it is not in order for questions offensive.—Mr. BEVAN: Further to that point of order, ld point out to you, Mr. Speaker, that the original ent complained of was exceedingly offensive.

WILSON HARRIS: Is it so unreasonable that what may med routine operations should be confined to these provided that emergency operations can take place hour? Mr. BEVAN: There are many inquiries to make ere are thousands of hospitals. In the absence of any ular information I have now to circularise all the al management committees. Certainly, it is perfectly able for operating-theatres to be closed during certain if they are always available for emergency operations, e implication here is a reflection on the National Health e. Mr. HENRY STRAUSS: Was not the original answer ectly proper one that the Minister was making inquiries, it not premature to say now whether this is substantiated ? Mr. BEVAN: A responsible person, if he thought that as being done, would have written to the Minister and him the name of the hospital in order that he might inquiries. Instead of that much anxiety, pain, and have been unnecessarily given to many hundreds of ands of people.

Use of Penicillin

S. T. SWINGLER asked the Minister what instructions een made by his department or by any regional hospital d to any hospital to reduce the use of penicillin on the d of expense; and if he would give an assurance that the f drugs under the National Health Service lay entirely n the discretion of doctors.—Mr. BEVAN replied: No instruction has been issued either by me or by any al hospital board and the matter is one entirely at the tion of the doctor. Mr. SWINGLER: Will the Minister request, very courteously, a member of the House of s either to substantiate or to have the common decency thdraw his allegation?—Mr. BEVAN: I do not propose nter into any communication with the noble Lord in this ter. If he will send me the precise information upon h he bases his very serious allegation, I will have inquiries le. In the absence of this information I can only ask the try to take no notice of such irresponsible statements.

Course for Trade-union Officers

r. CHARLES SMITH asked the Minister whether he had sidered the correspondence forwarded to him by the Member for Colchester indicating the refusal of a hosal management committee to grant special leave without pay to a member of the staff to attend a training course for trade-union officers; and whether, in view of the importance of building up a staff consultative machine in the hospital service, he would circularise all committees advising them to look sympathetically on such applications. Mr. BEVAN replied: Yes, Sir, and I am at present considering whether any more general advice to hospital management committees would be justified.

Mr. PHILIP PIRATIN: Can the Minister tell the House whether any guidance has been given to hospital boards in connexion with facilitating trade-union recruitment of the nurses and staffs? Mr. BEVAN: There is no need for me to give general guidance in this matter at all. All the arrangements for the recruiting of trade-union membership are well known to the unions concerned. Mr. SMITH: As hospital managements apparently do not recognise the desirability of setting up consultative machinery, and the necessity for this to be done by suitable people, who should be given an opportunity of having proper training for it, does the Minister really not think that some kind of indication from him is desirable on that point? Mr. BEVAN: As I said in my first answer, I am proposing to make inquiries to find out whether some general guidance ought to be given.

New Tax on Prescriptions

Sir THOMAS MOORE asked the Minister if he had made an estimate of the extent to which the proposed 1*s.* tax on National Health prescriptions would reduce the demand on doctors or, alternatively, increase the demand on chemists.—Mr. BEVAN replied: No, Sir. There is evidence of unnecessary resort to doctors and chemists which the proposed charge is intended to reduce, but I am unable to estimate the exact extent to which this is likely to take place. There is no reason why the proposed charge should increase the demand on chemists.

Price of Drugs

Mr. PIRATIN asked the Minister whether, in view of the high prices charged for prescribed medicines and proprietary brands of medicines and with a view to saving Government expenditure, he would consider introducing measures to control the drug industry.—Mr. BEVAN replied: The prescribing of unnecessarily expensive drugs is being investigated by a joint committee of the Central and Scottish Health Services Councils and I am waiting for their report.

Psychotic Children in Mental Hospitals

Mr. V. J. COLLINS asked the Minister if he was aware that owing to lack of suitable accommodation a number of psychotic children were housed in the same wards as adult patients in mental hospitals within the South-Western hospital region; and if, in his plans for dealing with this problem, he would have due regard for the desirability of providing the necessary accommodation on a regional basis.—Mr. BEVAN replied: The South-Western regional hospital board have recently made a careful inquiry into the question of accommodation for child psychotics in their region and have been in consultation with my officers about it. I am informed that there are now only three psychotic children in mental hospitals in the region and efforts are being made to remove them to other accommodation. The answer to the second part of the question is "Yes." We do not consider it desirable to have these children in mental homes for adults.

Leprosy Treatment at Reigate

Mr. G. C. TOUCHE asked the Minister if he was aware that the use of the Reigate and Redhill Infectious Diseases Hospital for cases of leprosy would embarrass the Reigate borough council in the discharge of its statutory duties in connexion with the supervision and control of infectious diseases in the borough of Reigate unless adequate alternative hospital accommodation was provided; and if he would give an assurance that such accommodation would be available before the present isolation hospital was turned into a leper colony.—Mr. BEVAN replied: Adequate alternative accommodation for cases of infectious disease already exists in other isolation hospitals in the area.

Hospitals and Casualty Announcements

Mr. BARNETT JANNER asked the Minister whether he was aware that, following a bus accident in Twickenham recently which resulted in people being taken to the West Middlesex Hospital, the names of the injured were not released to the newspapers until more than two hours had elapsed after admission; and whether, in view of public anxiety over such accidents, he would ask all hospitals to give such information without delay.—Mr. BEVAN replied: Full particulars were given to press representatives within half an hour after the last casualty was admitted to hospital. Hospitals have already been asked to give particulars of accident casualties to the press as quickly as possible.

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[1] The restriction of the use of operating-theatres and the prescribing of penicillin were mentioned by Lord Horder at the meeting of the Fellowship for Freedom in Medicine, on Nov. 19.

Replying to further questions Mr. Bevan said he thought it would be the view of everyone that it was desirable for relatives to hear of the accident first of all from the hospital and not read about it first in the press. He had no reason to suppose that the hospital had been at fault in any particular. Indeed there was every admiration for its administration.

Constituents of the National Loaf

Sir ERNEST GRAHAM-LITTLE asked the Minister of Food what were the present constituents in the national loaf, and in what proportions they were supplied; and what was the present subsidy in respect of bread as a single item.—Mr. JOHN STRACHEY replied: Not less than $87^1/_2\%$ of the flour used in national bread must be national flour. Substances other than national flour which may be included in national bread are:

Imported flour	Improvers of the nature of yeast food
Oils and fats	Any acid or acidic substances suitable for regulating the acidity of the dough
Water	
Salt	Potato and potato flour
Yeast	Barm

These materials are not supplied in any specified proportions but are obtained by bakers as required, subject only to a limitation as to the quantities of flour and oils and fats which may be purchased.

The total subsidy on bread, including the flour and baking subsidies, is estimated approximately £64·1 million per annum for the current financial year, of which £8·4 million represents the subsidy payable to bakers. The total subsidy is equivalent to about 6*d.* on each $3^1/_2$ lb. loaf.

Public Health

Water Softening

A Ministry of Health committee whose report[1] has appeared this week advises eventual extension of central water-softening schemes to all hard-water areas; and the committee has found no evidence that either hard or soft water is prejudicial to health. With some exceptions, central water softening is unlikely to benefit productive industry. Implementation of softening schemes will have to be deferred until economic conditions improve; and at present money, labour, and materials available for the water industry should be devoted to ensuring that water is sufficient.

Poliomyelitis

During the week ended Nov. 19, notifications in England and Wales were: poliomyelitis 219 (293), polioencephalitis 7 (23). Figures for the previous week are shown in parentheses. The decline in incidence has been greater than in the previous week. Multiple cases were reported from the following counties:

London 19 (47), Bedford 3 (1), Berkshire 5 (6), Buckingham 3 (3), Cornwall 2 (3), Cumberland 3 (1), Durham 2 (1), Essex 14 (18), Gloucester 8 (8), Hertford 4 (4), Kent 20 (22), Lancaster 10 (24), Leicester 3 (6), Lincs, Lindsey 2 (8), Middlesex 15 (15), Norfolk 3 (6), Northumberland 4 (6), Nottingham 4 (2), Somerset 4 (4), Southampton 3 (9), Stafford 2 (3), Suffolk, East 2 (1), Surrey 6 (14), Sussex, East 4 (8), Warwick 13 (6), Yorks, West Riding 32 (42), Glamorgan 10 (5), Monmouth 2 (1).

Typhoid Fever at Salford

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His monograph *Malaria in Bombay City*, which is lassic, showed the unexpected way in which a great a million inhabitants permeated with malaria be freed from the disease, as was indeed later d. As director of public health with the govern- f Bengal he worked strenuously at another great problem—the control of malaria in the region of ing rivers of Bengal. On his retirement from in India he was appointed to the chair of hygiene Egyptian University at Cairo, which he held till After returning to England he acted as medical of the child-welfare clinics at Wallington, Surrey, he spent his retirement.

ything Bentley undertook he carried out with ling enthusiasm and he never spared himself. A writer, he published many papers and reports as r of public health, of which *Malaria in Bengal* and *Malaria and Agriculture* (1925) were out- g. "To his friends," S. R. C. adds, "he was a ing and interesting companion and colleague. erate and understanding, he showed a generous nd of trouble to himself when doing kindnesses rs. He had brought the same qualities to his work. an intense interest in the problems and troubles Indian coolies or villagers, so that he was persona and in his element among them."

916 he received the Kaisar-i-Hind gold medal, and s appointed C.I.E. in 1929. In 1931 the University cutta conferred on him the honorary degree of M.D. s retirement from his Egyptian chair he was made ander of the Order of the Nile. He leaves a widow, ns, and two daughters.

Appointments

L. P. L., L.R.C.P.I., F.R.C.S.E., D.L.O.: ear, nose, and throat geon, north-west group of hospitals, Londonderry area.

l Service:

N, W. A., M.R.C.S.: senior M.O., Nyasaland.

ER, J. K., M.B. Glasg., D.P.H., D.T.M. & H.: senior M.O., Uganda.

AULEY, M. L., B.A., M.B. Dubl.: senior M.O., Fiji.

KICHAN, I. W., M.B. Camb., D.T.M. & H.: senior M.O., Uganda.

ERSON, D. R., M.B., B.SC. Glasg., D.T.M. & H., D.M.R.E.: specialist radiologist, superscale grade B, Federation of Malaya.

CEY, J. R. P., M.R.C.S.: M.O., Nigeria.

NELL, R. H., M.B. Lond., F.R.C.S.E.: surgeon specialist, Zanzibar.

EMOND, WILLIAM, M.B. Glasg.: M.O., silicosis bureau, Northern Rhodesia.

IES, H. G. H., B.A., B.M. Oxfd, D.T.M. & H.: senior M.O., Kenya.

INS, VIOLET, M.B. Edin.: lady M.O., Nigeria.

SON, W. A., M.D. Lond., D.P.H., D.T.M. & H.: senior M.O., Uganda.

Births, Marriages, and Deaths

BIRTHS

EDN.—On Nov. 15, in Manchester, the wife of Dr. C. Fridjhon —a daughter.

EST.—On Nov. 21, at Windsor, the wife of Mr. A. M. Gilchrist, R.C.S.—a son.

AMORE.—On Nov. 24, at Stapleford, Notts, the wife of Dr. T. O. damore—a daughter.

MARRIAGES

INS—EDGAR.—On Nov. 22, in London, Bethel Eric Robert mons, M.D., to Gillian Evaline Ruth Edgar.

—MITCHELL.—On Nov. 26, in London, R. F. Stubbs, M.B., Mrs. F. R. Mitchell.

DEATHS

SON.—On Nov. 25, in Manchester, James Henry Albinson, M.B. Manc.

TLEY.—On Nov. 23, at Carshalton, Charles Albert Bentley, C.I.E., M.B. Edin., D.P.H., D.T.M. & H.

WN.—On Nov. 20, Francis Joseph Brown, M.R.C.S., lieut.-colonel, R.A.M.C. retd, aged 83.

KIERNAN.—On Nov. 21, at Falmouth, Thomas Hugh Robinson McKiernan, B.A., M.B. Dubl.

OOD.—On Nov. 23, Allan Edward Mahood, M.B. R.U.I., F.R.C.S., aged 86.

R.—On Nov. 28, in Edinburgh, John Orr, M.D. Edin., F.R.C.P.E.

RY.—On Nov. 19, at Caermenai, Caernarvon, William Hilton Parry, M.C., M.B. Lpool.

VE-FLAXMAN.—On Nov. 20, in London, Samuel Christopher Reeve-Flaxman, M.R.C.S., aged 69.

DERS.—On Nov. 20, at Four Oaks, Warwickshire, Arthur Addison Sanders, O.B.E., M.B. Birm., surgeon captain, R.N. retd.

REY.—On Nov. 24, Bryan Hamilton Storey, M.R.C.S., aged 27.

LIVAN.—On Nov. 23, at South Kirkby, Yorks, Edward James Holmes Sullivan, M.D. R.U.I., aged 90.

Notes and News

FIFTY YEARS OF TROPICAL MEDICINE AT LIVERPOOL

ON Nov. 22, when a gathering was held at the Liverpool School of Tropical Medicine to commemorate the 50th anniversary of its foundation, the Mary Kingsley medal was awarded to representatives of the families of those who had helped to found and to maintain the school, and also to scientists distinguished in the field of tropical medicine. These latter were Emeritus Prof. D. B. Blacklock, Prof. P. A. Buxton, F.R.S., Prof. N. Hamilton Fairley, F.R.S., Dr. A. F. Mahaffy, Sir Philip Manson-Bahr, Sir Edward Mellanby, F.R.S., Prof. Jerome Rodhain (Antwerp), Dr. Paul F. Russell (U.S.A.), Prof. H. E. Shortt, Brigadier J. A. Sinton, F.R.S., Prof. N. H. Swellengrebel (Amsterdam), and Prof. W. H Taliaferro (U.S.A.). The medal was also conferred posthumously on Warrington Yorke.

The origin of the school goes back to 1898 when Joseph Chamberlain, then Secretary of State for the Colonies, at the insistence of Sir Patrick Manson appealed to the country for the foundation of centres of study for tropical diseases able to undertake the training of doctors for service in the Colonial Empire. A number of commercial and medical interests in Liverpool met together on the initiative of Alfred Lewis Jones, who was then head of the Elder Dempster Line engaged in trading to West Africa. As a result the school began work in April, 1899, in the wards of the Liverpool Royal Southern Hospital, under the chairmanship of Alfred Jones, and with Rubert Boyce, professor of pathology in the then University College, as dean. One of the first members of the staff was Ronald Ross, who was appointed lecturer in tropical diseases. In 1905 a branch laboratory of the school was established at Manaos, on the Amazon, where research initially was concentrated on yellow fever. In 1921 a second laboratory was opened in Freetown, Sierra Leone, the funds being provided from a bequest by Sir Alfred Jones. Meanwhile the school had become integrated with the University of Liverpool, and some members of the staff were appointed to newly founded university chairs.

The activities of the school have steadily grown, and at present an enlarged staff is actively engaged in teaching and in research both in this country and overseas, and in the diagnosis and treatment of tropical diseases in this country. With half a century of substantial achievement behind it, including the work of men like Ross, Stephens, Warrington Yorke, Newstead, and Blacklock, there is every incentive to face the next half century with determination and confidence.

THE DISTINCTION AWARDS

IN our leading article of Oct. 22 we wrote of the Spens Committee's proposal "that after a specialist had reached his maximum basic salary of £2500 (now £2750), his remuneration should cease to depend in any way on the length of his service, but that distinction awards, of three different grades, should be made to 34% of specialists selected . . . as exceptionally meritorious." This sentence has, we understand, been taken to imply that distinction awards can be made only to consultants who have reached the maximum basic salary of £2750. We must therefore make it clear that no such implication was intended. The summary of the Spens Committee's recommendations says that "*all specialists of staff status* should be eligible for these distinction awards," and one of the committee's explicit objects was "to ensure that *in the lower age range also* outstanding ability should be rewarded by remuneration in excess of the basic incremental scale" [our italics].

University of Oxford

On Nov. 19 the degree of D.M. was conferred in absence on W. B. Matthews.

Scottish Conjoint Board

The following candidates, having passed the final examination, have been admitted to the licentiateship of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow:

A. R. Acton, D. J. M. Allan, Catherine Aicken, Eva M. Bobasch, Mary Brannigan, E. G. Caira, Catherine Coneghan, W. K. Davidson, D. G. Davies, W. A. Dryburgh, Esin Anwana Esin, M. M. Ferris, Elizabeth M. Fulton, J. C. Gallagher, T. C. Glasgow, Jean M. Greenwood, W. T. G. Hathaway, E. H. Jacobs, J. M. King, Marjorie J. Lyon, M. B. McElroy, John McGlone, Barbara P. P. Melhuish, A. J. R. Milner, S. H. Morgenstern, Joan M. Ponsford, Margaret J. Sutton, G. A. Taylor, R. L. Volinsky.

to the newspapers until more than two hours had elapsed after admission; and whether, in view of public anxiety over such accidents, he would ask all hospitals to give such information without delay.—Mr. **Bevan** replied: Full particulars were given to press representatives within half an hour after the last casualty was admitted to hospital. Hospitals have already been asked to give particulars of accident casualties to the press as quickly as possible.

Replying to further questions Mr. Bevan said he thought it would be the view of everyone that it was desirable for relatives to hear of the accident first of all from the hospital and not read about it first in the press. He had no reason to suppose that the hospital had been at fault in any particular. Indeed there was every admiration for its administration.

Constituents of the National Loaf

Sir **Ernest Graham-Little** asked the Minister of Food what were the present constituents in the national loaf, and in what proportions they were supplied; and what was the present subsidy in respect of bread as a single item.—Mr. **John Strachey** replied: Not less than 87½% of the flour used in national bread must be national flour. Substances other than national flour which may be included in national bread are:

Imported flour
Oils and fats
Water
Salt
Yeast

Improvers of the nature of yeast food
Any acid or acidic substances suitable for regulating the acidity of the dough
Potato and potato flour
Barm

These materials are not supplied in any specified proportions but are obtained by bakers as required, subject only to a limitation as to the quantities of flour and oils and fats which may be purchased.

The total subsidy on bread, including the flour and baking subsidies, is estimated approximately £64·1 million per annum for the current financial year, of which £8·4 million represents the subsidy payable to bakers. The total subsidy is equivalent to about 6*d.* on each 3½ lb. loaf.

Public Health

Water Softening

A Ministry of Health committee whose report[1] has appeared this week advises eventual extension of central water-softening schemes to all hard-water areas; and the committee has found no evidence that either hard or soft water is prejudicial to health. With some exceptions, central water softening is unlikely to benefit productive industry. Implementation of softening schemes will have to be deferred until economic conditions improve; and at present money, labour, and materials available for the water industry should be devoted to ensuring that water is sufficient.

Poliomyelitis

During the week ended Nov. 19, notifications in England and Wales were: poliomyelitis 219 (293), polioencephalitis 7 (23). Figures for the previous week are shown in parentheses. The decline in incidence has been greater than in the previous week. Multiple cases were reported from the following counties:

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SURVEY OF PHYSICAL FITNESS IN CEYLON

H. CULLUMBINE
M.D., M.Sc. Sheff.
SOR OF PHYSIOLOGY AND PHARMACOLOGY IN THE UNIVERSITY OF CEYLON, COLOMBO

term "physical fitness" has a different meaning ferent people, but to the physiologist it implies the ability to perform muscular effort. Gallagher rouha (1943) have indicated at least three main of physical fitness: (1) *static fitness*, as shown by ganically sound and well-developed body: (2) *ic fitness*, the ability to perform muscular effort;) *specialised fitness*, the ability to perform particular

assessment of specialised fitness lies at present in the field of the physiological psychologist, is the pure physiologist has concerned himself he study of dynamic fitness. There are many tions, however, that dynamic fitness is significantly iced by static fitness (Seltzer 1940, Gallagher and a 1943, Cullumbine et al. 1949b).

re are many different types of muscular effort; there must be many aspects of dynamic fitness. lly the ability to perform different muscular efforts ds on the possession of some or all of the following rties: ability for moderate exercise; ability for exercise; ability for protracted moderate exer-speed; and strength. Each of these five properties therefore be assessed in a comprehensive appraisal namic fitness.

assessment of dynamic fitness rests on the fact that are measurable differences in performance and in logical response to exercise between the fit and nfit. Thus, if we compare fit and unfit men of the height and weight, doing the same amount of rate work, we find that the fit man has a lower n consumption, a slower pulse, a lower systolic -pressure, a lower blood-lactate level, and a larger volume while working, and a faster return of the pressure and the pulse-rate to resting values after (Bock et al. 1928). If both the fit and the unfit perform severe work, the fit man can continue for a time before he is exhausted and has a higher n consumption, a lower maximal pulse-rate, a larger e volume, a higher blood-lactate level, and a er return of his blood-pressure to normal after work inson and Harmon 1941). Thus, the difference in ological response between the fit and the unfit s with the severity of the exercise, so tests of ise performance should include those involving rate effort and those involving effort to exhaustion. e physiological criteria used for judging exercise rmance are those enumerated above for distinguish-etween the fit and the unfit. Not all those criteria, wer, are equally sensitive or equally valuable. Most ers agree that the pulse-rate during recovery and lood-lactate level are the most sensitive measures of ss for moderate exercise, and that the time for which ise can be maintained is the best index of fitness in ular effort to exhaustion. Therefore fitness indices, d on the pulse-rate during recovery and the time of ormance of the test exercises, are usually used to give merical quantitative assessment of a person's response xercise (Johnson et al. 1941). We have also shown the systolic blood-pressure during recovery can be in calculating similar fitness indices (Cullumbine 9a).

TESTS

or our exercise tests we used a step 20 inches high, subject stepping up and down from this step at a constant rate, timed with a metronome. The step test was chosen because it has the advantage for field work of needing little apparatus and little skill to perform. It involves a natural type of exercise, performed at a constant rate and involving large groups of muscles and it places the cardiovascular and respiratory systems under definite stress. Various modifications of the step test have been used to assess the different aspects of dynamic fitness. Thus, the following functional tests have been performed by each subject:

(1) The Harvard step test (Brouha et al. 1943), which is a moderate exercise test in which a "steady state" in cardiovascular and respiratory response is reached (Cogswell et al. 1946). Thirty "step-up and step-down" cycles a minute were performed for 5 minutes, and the fitness index (pulse) and the fitness index (blood-pressure) were calculated for each person. This test has been shown to be a rapid and reasonably accurate method of assessing exercise fitness (Gallagher and Brouha 1943), and we have shown that it will distinguish between groups of people known to possess different types of fitness, and that reproducible results can be obtained with it.

(2) The endurance step test (Cullumbine 1949a), which is a severe exercise test in which a rapidly increasing oxygen debt is acquired and fatigue quickly ensures. Here forty-five cycles a minute were performed until the pace could be maintained no longer, and the endurance index (time), endurance index (pulse), and endurance index (blood-pressure) were obtained for each subject. We have shown that this test distinguishes the fit from the unfit, gives repeatable assessments in the case of people not undergoing specialised training, and, for trained athletes, can differentiate between those specialising in long-distance running and those specialising in shorter distances.

(3) The exhaustion step test measures ability to sustain moderate effort to fatigue, thirty cycles a minute being performed for as long as possible. The exhaustion index (time), the exhaustion index (pulse), and the exhaustion index (blood-pressure) were calculated for each subject.

(4) Speed of movement was simply assessed by the time required to run competitively 100 yards.

(5) Strength was measured by the ability to lift a graded series of weights 20 inches from the ground. The grip of the right hand was also measured with a dynamometer. These strength tests will note increases produced by training (Cullumbine 1949a).

Motivation is very important in all performance tests, especially those involving effort to fatigue. For this reason the subjects tested usually performed the endurance step test with the vocal support of their colleagues, whereas the exhaustion step test was made a competition between rival schools. Similarly, all our measurements of speed were made during competitive running.

Our survey has so far included about 8000 subjects, from the age of 10 years upwards and of either sex, of the Sinhalese, Ceylon Tamil, Indian Tamil, Moorish, and Malay races, and of burgher extraction (chiefly Dutch burghers claiming descent from the Dutch colonists). Most of them were school-children, but the adults included workers on tea, rubber, and coconut estates, harbour labourers, government clerks, members of the Agricultural Corps, policemen, plumbago miners, and, in a few instances, entire village communities. The subjects were picked at random, so far as possible, from those said to be typical of the racial, social, and economic status of each province.

All the subjects were examined in their native environment. Up-country and low-country districts, cities, towns, and villages, wet and dry zones, and malarial and healthy areas were visited. Only accessibility by track or by moderate distances of porterage limited our choice. The same team surveyed the whole island, and each person was in charge of the same tests throughout.

Measurements were made of exercise-performance ability, of vital capacity, of various anthropometric diameters, circumferences, and lengths, and of the greatest circumferences of the arm, forearm, thigh, and

Paddington Green Hospital

The board of governors of St. Mary's Hospital, London, decided, at a meeting on Nov. 24, to ask the subcommittee on reorganisation and coördination of services to reconsider their original proposals with a view to formulating a revised scheme which would provide for the retention of Paddington Green Hospital as a children's hospital.

Training of Psychiatric Registrars

The North East Metropolitan regional hospital board have approved a scheme to enable registrars in psychiatry to prepare for the diploma in psychological medicine. Training in clinical psychiatry will be carried out in the board's own hospitals; and opportunity will be provided for trainees to obtain additional instruction at the Maudsley Hospital, Denmark Hill, and at the Maida Vale Hospital for Nervous Diseases. The course, lasting three years, will include all branches of psychiatry and ancillary subjects. Trainees will be able to attend selected child psychiatric clinics of teaching standard. Arrangements will also be made for the secondment of students to a mental-deficiency institution, or, in the case of trainees working in mental-deficiency institutions, to a mental hospital.

Society of Medical Officers of Health

At this society's annual dinner in London on Nov. 24, Sir Wilson Jameson heard warm tributes to his work as chief medical officer to the Ministry of Health—a post from which he is to retire next May. Prof. R. H. Parry said that medical officers of health felt "an especial admiration for him, and it is not only the circulars he sends us"; while Prof. Hilda Lloyd, president of the Royal College of Obstetricians and Gynæcologists, spoke with pleasure of the honorary fellowship of the college which he had received. Mr. Aneurin Bevan described him as "one of the very great public servants of Great Britain." Mr. Bevan had learned by experience that usually the greater a man's academic qualifications, the more remote he was from *reality*. But in Sir Wilson Jameson knowledge was matched by sagacity; he was one of the wisest men, and he was also extraordinarily amiable.

Mr. Bevan, who was proposing the Society, pointed out that Sir Wilson, and also his successor, were former medical officers of health. He himself had spent seven years on a county council, where he had learned greatly to respect medical officers of health. In moments of candour he told clinicians that by and large the largest contributions had been made by the medical officer of health and the sanitary inspector; but he did not wish to pursue this subject, which might lead him to one or two topics that he was anxious to avoid. He believed that the past four and a half years had been the most fertile in the history of public health in Britain. Some found difficulty in reconciling themselves to change; but "I believe that as the years go by people will begin to wonder what they did without the health service." He fancied that the medical profession's first gleeful anticipation of being rid of him was being replaced by a dawning apprehension. Was it perhaps that the profession preferred the devil it knew, or had it become masochistic? There might even be a sense of nostalgia at his departure, and he looked forward to the time when the B.M.A. would send a round-robin to the Prime Minister of the day appealing for his recall to the Ministry of Health.

In reply, Dr. H. C. Maurice Williams, the president, spoke ruefully of the small number of candidates for the D.P.H. and for posts in public health. It was the public-health officers who had appreciated the value of a comprehensive—and indeed of a full-time—medical service. Yet in the service preventive medicine took second place to curative medicine. "If we had had the wisdom to establish a Royal College of Preventive Medicine, we should have found ourselves in a much better position." Though some advocated regionalisation, he personally hoped that public health would continue to be associated with local authorities, whose influence he had found stimulating. He hoped, too, that health centres would be instituted as quickly as possible, even in improvised buildings. Both Mr. Bevan and Sir Stafford Cripps were constantly in the thoughts of the medical officer of health—Mr. Bevan as the architect of the future structure, and Sir Stafford because of a sentiment aptly expressed in *Chronicles*: "Behold, I say, how they reward us."

Professor Lloyd and Lord Kennet responded to the toast of The Guests proposed by Professor Parry, the immediate past-president.

King Edward VII College, Singapore

Dr. E. S. Monteiro has been appointed to the clinical medicine, and Dr. G. A. Ransome to the medicine.

War Office

Brigadier Thomas Young, O.B.E., formerly direct medical services of the Far East Land Forces, has succ Brigadier A. E. Richmond, C.B.E., K.H.S., as director of health.

Dr. Ludwig Guttmann has left for Israel where he spend three weeks advising the medical authorities of government on the organisation of a centre for the treat and rehabilitation of paraplegics.

CORRIGENDUM: *Effect of the Head-down Position o Circulation in Hypotensive States.*—In the article of No (p. 941) the authors' appointments should read: A. Graham, lecturer in surgery for dental students; I Douglas, reader in experimental surgery.

Diary of the Week

DEC. 4–10

Monday, 5th

UNIVERSITY OF LONDON
5.30 P.M. (University College, W.C.1.) Prof. G. L Brown, Chance and Design in Physiological Research (Ins lecture.)

HUNTERIAN SOCIETY
8.30 P.M. (Talbot Restaurant, London Wall, E.C.2.) Sir Evans, Dr. Frankis Evans, Mr. A. Lawrence Abel: ment of Surgical Risk.

Tuesday, 6th

ROYAL COLLEGE OF PHYSICIANS OF *LONDON*, Pall Mall East,
5 P.M. Prof. W. H. Wynn: The Pestilences of War— 15th Century. (First FitzPatrick lecture.)

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histopathology of the Skin.

EDINBURGH POST-GRADUATE *BOARD FOR* MEDICINE
5 P.M. (University New Buildings, Teviot Place) Sir Parkinson: Radiology of the Aorta.

EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Mr. Richardson, D.SC., F.R.S.: War and Eugenics

Wednesday, 7th

HARVEIAN SOCIETY OF *LONDON*
8.15 P.M. (26, Portland Place, W.1.) Dr. V. C. Medvei: and Physical Effects of Pain. (Buckston Browne essay.)

INSTITUTE OF PSYCHIATRY
4.30 P.M. (Maudsley Hospital, S.E.5.) *Dr. Erwin St* Lecture-demonstration.

ADLERIAN SOCIETY OF *GREAT BRITAIN*
8 P.M. *Medical Section.* (11, Chandos Street, W.1.) Dr Snowden: Instructional Group Psychotherapy.

MEDICO-CHIRURGICAL SOCIET [illegible] lson S
8.30 P.M. (Royal Colleg [illegible] and
Dr. Robert Lees: [illegible]
Problem.

Thursday, 8th

ROYAL COLLEGE OF PHYSICIANS [illegible] of War—16th t
5 P.M. *Professor* [illegible]
Century. ([illegible] Fields, W.C.2

ROYAL COLLEGE OF [illegible] rnott demonstr
3.45 P.M. Mr. R. J. [illegible]

INSTITUTE OF PSYCHIATRY
4.30 P.M. Prof. W. E. Le Gros Clark, F.R.S.: The So Rhinencephalon.

VICTOR HORSLEY LECTURE
5 P.M. (University *College Hospital* Medical School, W Sir Hugh Cairns: *Disturbances* of Consciousness Disorders of the Brain-stem.

CIBA FOUNDATION, 41, Portland Place, W.1
5 P.M. Prof. E. C. Dodds, F.R.S.: The Analogue as an In in Biological Research.

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. R. T. Brain: Virus Diseases of the Skin.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Desmond Curran: Psychiatry lecture-demonstration.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Po Place, W.1
7.30 P.M. Dr. Michael Gelfand: Tropical Phlebitis and Possibly Related Vascular Disorders of Tropical Af

CHADWICK PUBLIC LECTURE
4.30 P.M. (St. Mary's Hospital Medical School, W.2) Dr. Dowling: Generalised Systemic *Sclerosis* (Prog Symmetrical *Scleroderma*—Dermatomyositis) (M Morris lecture.)

Friday, 9th

MAIDA VALE [illegible] DISEASES, W.9
5 P.M. Mr. [illegible]

WEST KENT [illegible]
8.30 P.M. ([illegible]
The [illegible]

BLE I—SIGNIFICANT VARIATIONS WITH RACE, ENVIRONMENT, AND ECONOMIC LEVEL IN FITNESS INDEX (STRENGTH, EXHAUSTION TIME, AND SPEED) AND IN RELATED ANTHROPOMETRIC CHARACTERS

Fitness index or anthropometric character	Racial differences	Environmental differences	Economic differences (income groups)
, exhaustion time, and	Sinhalese > Ceylon Tamil and Ceylon Moor	Wet zone > dry zone > Colombo	Higher > intermediate > low
ars	Ceylon Tamil > Sinhalese > Indian Tamil; Ceylon Moor > Sinhalese and Indian Tamil	Wet zone > dry zone and Colombo	Higher > intermediate > low
diameter	None	Wet zone > Colombo and dry zone	Higher and intermediate low
ic diameter	Sinhalese and Ceylon Moor > Indian Tamil	Dry zone > wet zone	Intermediate > higher and low
mference height ..	Sinhalese > Ceylon Tamil, and Indian Tamil	Dry zone > Colombo and wet zone	None
th	Sinhalese > Indian Tamil; Ceylon Tamil > Indian Tamil	Wet zone > Colombo and dry zone	Intermediate and higher > low
ial measurement ..	Sinhalese, Ceylon Tamil, and Ceylon Moor > Indian Tamil	Wet zone > dry zone and Colombo	Intermediate and higher > low
.. ..	Sinhalese, Ceylon Tamil, and Ceylon Moor > Indian Tamil	Wet zone > dry zone and Colombo	Higher > intermediate > low
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dth	Sinhalese, Ceylon Tamil > Indian Tamil	Wet zone > dry zone > Colombo	Higher > intermediate > low
th	Sinhalese > Ceylon Tamil	Wet zone > dry zone	Higher and intermediate > low

gil of Wetzel (1941). Our classification has been ts following groups: obese (corresponding to 's channels A^4 and A^5), stocky (Wetzel's A^2 and mal (Wetzel's A^1, M^1, and B^1), slim (Wetzel's B^3), and undernourished (Wetzel's channel B^4). ing our subjects in this manner and allowing for ence of age and sex, we have compared the mean dices for the various types of physique (Cullum- al. 1949b). We conclude that physique does not play an important rôle in determining a person's to perform moderate exercise (Harvard step test), e slimmer or more linear the physique the greater endurance index. By contrast, we find that , speed, and the performance of moderate exercise e are all greatest in people of normal or stocky e.

hip with *Various Anthropometric Characters*

ising that the above-mentioned classification gure, though valuable in field work for rapid , is only crude, we have further analysed our data ence of relationship between various anthropo- measurements and indices and the fitness indices. s of correlation have been calculated, and the regression technique has been used in our (Cullumbine 1949e). By these means we have d the following significant correlations:

s index (pulse) positively with bi-iliac diameter, height, st circumference/height, with bi-iliac diameter, and gomatic diameter.

index (blood-pressure) positively with chest est breadth, and negatively with weight/height, est breadth, with chest length, with weight, and ght.

rance index (time) negatively with bi-iliac diameter d bi-iliac/bi-acromial diameter.

th, exhaustion time, and speed positively with area, with chest circumference/height, with chest rence, with chest breadth, with leg length, with bi-acromial, and bizygomatic diameter, and with

of these relationships may be only indirect , for example, some of the anthropometric ers are related significantly to physiological ers, such as vital capacity, resting pulse-rate, systolic blood-pressure, &c. (Cullumbine 1949f), latter are, as we have seen, also related to dynamic fitness. Thus, the fitness index (blood-pressure) is negatively correlated with height and weight in our subjects. Calculation of the partial correlation coefficients shows that the influence of height on the fitness index (blood-pressure) is due solely to its influence on the resting systolic blood-pressure.

However, our anthropometric-fitness correlations illustrate the type of person who has the better performances at different exercise tasks, and they agree, in general, with the findings of Woods et al. (1943) and others using somatotype ratings.

Environment and Economic Status

Perhaps the best demonstration of the reality of the above-mentioned correlation is seen when we consider the effect of environment and economic status on dynamic fitness. Ceylon can be divided into three main environments: the city of Colombo, the wet zone, and the dry zone. The distinction between the wet and the dry zones is based chiefly on their different average rainfalls during the S.W. monsoon. It is a real division from the points of view of the fertility of the soil and the prosperity, nutrition, and health of the people. The influence of age, sex, and race being allowed for, the mean fitness indices of the people living in these three environments have been compared (Cullumbine et al. 1949c). We find that people in the wet zone have a higher mean fitness index (pulse) than have those in the dry zone and in Colombo. The people of Colombo have a higher mean endurance time than have the people in the dry zone, and the latter have a greater mean endurance time than have the people in the wet zone. For strength, exhaustion time, and speed the descending order of the mean indices is wet zone, dry zone, and Colombo.

The people living in these three environments also show significant differences between their mean anthropometric characters (Cullumbine 1949g), and there is a very close correlation between these anthropometric differences and the differences between their fitness indices (Cullumbine 1949e). An example of this relationship is shown in table I, and the differences in body configuration seem to give a reasonable explanation of the differences in fitness of the peoples of the three main environments. These environmental differences are apparently not due to climatic differences at the time of the tests. All the tests were done during the "cool" calf in extension. For calculating the fitness indices, pulse-rate (in many cases heart-rate by auscultation over the chest) and brachial blood-pressure were estimated by two observers before and after each step test. In addition, details of each subject's age, sex, race, ancestry, diet, family occupations, and family income were recorded. The information about diet was later supplemented by a nutrition survey of many of the communities (Bibile et al. 1949).

RESULTS

Our findings have been reported *in extenso* elsewhere; so we confine ourselves here to discussing the information they give on the relation between dynamic fitness and age, sex, race, environment, body build, and muscular development. Most of the other relevant work has been done by Americans, and Cureton et al. (1947) have given an excellent summary of the published reports.

Age

The fitness index (pulse) for moderate exercise (Harvard step test) does not vary significantly during the pre-adolescent years, but there is a sudden decline at the age of 14. There is a further significant fall at the age of 17, and this is followed by a steady rise to a maximum between 21 and 25. Even this adult maximum, however, is less than the mean fitness index in the pre-adolescent years (Cullumbine et al. 1949b).

The fitness index (blood-pressure) falls steadily throughout life; hence the mean index for men in their fifties is less than half that for boys of 10, and the mean index for women over 40 is only about a third of that for girls of 10. Apparently a man's capacity for lowering his systolic blood-pressure after moderate exercise decreases more rapidly with age than does the capacity for slowing his post-exercise heart-rate.

The endurance indices for severe exercise (endurance step test) show an over-all variation with age very similar to that shown by the fitness index (pulse).

The exhaustion indices for protracted moderate exercise (exhaustion step test), speed, and strength all increase with age to maxima in early adult life.

Sex

The variation with age of the fitness indices is in general the same in either sex, but at all ages females give lower assessments than do males.

Muscular Development

The muscular development of the arm has been assessed (Cullumbine 1949b) by dividing the sum of the greatest circumferences of the right arm and forearm by the subject's height, and that of the leg by dividing the sum of the greatest circumferences of the right thigh and calf by the height. This method ignores the thickness of the skin and subcutaneous fat, but Ceylonese are so devoid of fat that this is probably justified.

We have found a significant but negative correlation between leg-muscle development and the fitness index (pulse) ($r = -0{\cdot}8682$ for 500 subjects chosen at random), and between leg-muscle development and endurance time ($r = -0{\cdot}3838$ for 500 subjects chosen at random). This means that the less is a person's muscular development the greater are his fitness index (pulse) and his endurance time. Perhaps the less the muscular development the less is the strain on the circulation in supplying an increased blood-flow through the muscles during activity.

Leg-muscle development and exhaustion time are not correlated significantly ($r = -0{\cdot}2911$ for 1000 subjects), but leg-muscle development and speed are correlated ($r = +0{\cdot}3873$ for 500 subjects). Similarly, strength and arm-muscle development are positively and very significantly correlated ($r = +0{\cdot}9124$ for 500 subjects).

Resting Cardiovascular State

The coefficients of correlation (r) between the sitting pulse-rate, the sitting systolic and diastolic blood-pressure and pulse-pressure, and the various
indices have been calculated from the data for
subjects (Cullumbine 1949c). We find that the si
pulse-rate is not correlated significantly with s
endurance time, or strength, but it is correlated s
cantly with the fitness index (pulse) ($r = -0{\cdot}3740$
possibly with exhaustion time ($r = -0{\cdot}2002$).
means that people with relatively slow resting pulse
have relatively slow pulse-rates after moderate exe

The sitting systolic blood-pressure is not corr
significantly with endurance time, but is correlated
the fitness index (pulse) ($r = -0{\cdot}2378$), with
($r = +0{\cdot}3215$), with exhaustion time ($r = +0{\cdot}2003$
with strength ($r = +0{\cdot}5710$).

The sitting diastolic blood-pressure is corr
significantly with the fitness index (pulse) ($r = -0$
but not with the other indices, and the sitting
pressure is not correlated significantly with any
indices.

Therefore our results suggest that the slower the r
pulse-rate the slower is the pulse-rate after mo
exercise. This agrees with the findings of most ob
Similarly, the lower the resting systolic blood-pr
the lower is the post-exercise systolic blood-pressur
5 minutes' moderate effort. Conversely, the high
resting systolic blood-pressure the greater are the
of movement, the strength, and the time of perfor
of moderate exercise to fatigue.

Respiratory Efficiency

Many tests have been suggested for assessing r
tory efficiency. These include the breath-holding
a measurement of the respiratory force, Flack's
test, and a simple measurement of the vital cap
We have used all these tests and conclude that ou
vital capacity is correlated significantly with a pe
capacity for exercise, and then only with endu
time (Cullumbine and Williams 1949). Presumabl
is because severe, and not moderate, exercise invol
oxygen debt, and the magnitude of the oxygen
which can be achieved or sustained may be rela
the capacity of the respiratory tract—i.e., to the
capacity.

Blood Hæmoglobin

Since hæmoglobin is the oxygen carrier betwee
lungs and the active tissues, we might expect to
relationship between exercise ability and hæmo
level. In fact, we have found that this level is corr
significantly with speed, strength, and exhaustion
(Cullumbine 1949d). It is understandable ho
oxygen-carrying capacity of the blood may lim
least partly, the response to protracted muscular
but it is difficult to see how it can help to dete
speed and strength. Some common causal factor
nutritional status—may be involved.

The hæmoglobin level is not correlated with the
index (pulse). This agrees with the conclusio
Spealman et al. (1948) and is to be expected, since
is a large reserve of oxygen-carrying power in a
the most anæmic persons, and moderate exercise of
duration would not unduly strain this reserve.
the hæmoglobin concentration related significant
endurance time. Perhaps, in this case, the exer
so severe that the oxygen debt acquired is too la
be influenced by the rather small range of hæmo
levels presented by our normal subjects.

Physique

Sheldon's classification into somatotypes (Shel
al. 1940) is probably the most accurate method av
for grading people according to body type. For acc
this requires three photographs of each person ta
standard positions, which was impossible in our
survey. As an alternative, though admittedly
accurate, method of grading we have used the

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TABLE II—RELATION BETWEEN DYNAMIC FITNESS AND PHYSIOLOGICAL AND ANTHROPOMETRIC CHARA

Exercise ability	Correlation with:					Relation to:		Correlation with anthropometric cha
	Resting pulse-rate	Resting blood-pressure	Vital capacity	Hæmoglobin level	Muscular development	Physique	Age (from 10 yr. to early adult life)	
Speed	None	+	None	+	+	Stocky best	Increases with age	Positive with surface area, chest circum and breadth, leg length, hip width, s width, and weight
	None	+	None	+	+	Stocky best	Increases with age	Positive with surface area, chest circum and breadth leg length, hip width, s width, and weight
Moderate effort to exhaustion	–	+	None	+	None	Stocky best	Increases with age	Positive with surface area, chest circum and breadth, leg length, hip width, s width, and weight
Rapid severe effort	None	None	+	None	–	Slim best	Decreases with age	Negative with hip width; and hip width to shoulders
Moderate effort for 5 minutes	–	–	None	None	–	No correlation	Decreases with age	Positive with hip width; negative with height, weight/height, chest breadth and

season, and we could find no relationship between fitness and air temperature, relative humidity, and effective temperature.

We have also classified our subjects according to their economic status. From information on family income, family occupations, size of family, &c., we have distinguished three income groups—low, intermediate, and higher. These groups differ in their mean dynamic fitness, the intermediate income group having a significantly greater mean fitness index (pulse) and a greater endurance time than the low or higher groups, whereas the higher-income group has greater means of strength, exhaustion time, and speed than the intermediate group, which in turn has greater means than the low-income group. As would be expected, we have found differences in the anthropometric characters between the three income groups (Cullumbine 1949g), and these anthropometric differences again parallel the fitness differences (see table I).

Race

Since exercise-performance ability is correlated with certain anthropometric characters, and since anthropometric differences are known to exist between persons of different races, are there distinguishable racial differences in exercise ability? Our data indicate that there are. No significant racial differences in fitness index (pulse) have emerged, but both the Sinhalese and the Indian Tamil have a greater mean endurance time than the Ceylon Tamil. In strength, exhaustion time, and speed the means for the Sinhalese are greater than those for the Ceylon Tamil and the Ceylon Moor. These racial differences in fitness indices are paralleled by the differences in anthropometric characters (table I), but the correspondence is not so close as in the case of the environmental and economic differences. Thus, the bi-iliac/height and the chest-circumference/height indices differ between races and are correlated with the fitness index (pulse), which, however, does not vary significantly between races.

This emphasises the fact that there are influences other than anthropometric ones which can affect dynamic fitness. We have shown, for example, that the fitness index (pulse) is correlated negatively with the resting pulse-rate and with leg-muscle development, which, like the fitness index (pulse), do not vary with race (Cullumbine 1949b and f).

DISCUSSION

We have postulated that there are at least five basic aspects of dynamic fitness: speed, strength, the ability to perform moderate exercise of relatively short duration (as measured by the fitness indices), the ability to perform rapid severe exercise (as measured by the endurance
indices), and the ability to perform moderate
for a long time (as measured by the exhaustion in
and we have shown how each of these aspects
influenced by age, sex, resting cardiovascular
respiratory efficiency, hæmoglobin concentration,
configuration, muscular development, racial c
teristics, and gross environment. From our resul
clear that these five basic aspects can be placed in
groups: (1) strength, fitness for protracted mo
exercise, and speed; and (2) fitness for modera
severe exercise (table II).

The first group are very similarly related with
measurements, resting systolic blood-pressure, mu
development, and hæmoglobin level. They are, in g
correlated with the physical and physiological cha
which increase with age, and they themselves also i
with age (significant correlations are still obtainabl
the influence of age is eliminated). These three
are also correlated with each other. Thus, spe
endurance time are very significantly correlated
0 9922 (Cullumbine et al. 1949a). This group a
influenced in much the same way by environ
factors, race, and sex. The related body measur
are influenced in a corresponding manner by e
ment, race, and sex, but factors other than these
physical characters may also be important. The
globin content of the blood, for example, is gre
Ceylonese males than in Ceylonese females, gre
the wet zone than in the dry, greater in the higher-
group, and greater in Sinhalese then in Ceylon
Ceylon Moor, and Indian Tamil (Bibile et al.
Strength, exhaustion time, and speed have a
variation.

The indices for moderate and for severe exer
contrast, tend to decrease with age and are neg
correlated with leg-muscle development. Leg
development is not influenced by age (Cullumbine
nor can variations in leg-muscle development
environment explain the differences noted for
two aspects of fitness between people in di
environments.

The resting systolic blood-pressure of Ce
increases with age to reach a maximum in earl
life (Cullumbine 1949h); and, since this pre
negatively correlated with the fitness indices, t
with age would favour a fall in the indices. On th
hand, the fitness index (pulse) is negatively cor
with the resting pulse-rate, which tends to decre
age in Ceylonese (Cullumbine 1949h); this d
would favour a rise in the fitness index (pulse).
capacity and endurance time are positively cor
but vital capacity increases with age in Ce
(Cullumbine 1949i), and racial variations in vital c

t correspond to the racial variations in endurance Similarly, the anthropometric characters increase, nain constant, with age. It is clear that, though physical and physiological factors are known to ncerned in exercise performance, our knowledge far from complete.

influence of environment on physical or static and on dynamic fitness may be purely dietary. Bibile et al. (1949) have shown that the diets of in the dry zone and in the low-income group are r in every respect to those of people in the wet nd in the intermediate and higher income groups. e other hand, such debilitating diseases as hook- infestation and malaria are more common in the ne and among the poorer classes.

literature on the influence of diet on fitness for lar activity is voluminous but conflicting. Though dmitted that protracted semi-starvation causes a nd decrease in muscular performance (Henschel the optimum vitamin requirements for fitness for lar effort are still not settled. Comroe and Dripps and Cullumbine et al. (1949c), who have reviewed ork done on this subject, conclude that further ted and adequately controlled experiments are ry before the effects of vitamin deficiencies on ic fitness can be accurately assessed.

assessment of possible dietary influences on ic fitness during field work is complicated by the at this functional fitness can be improved by regular exercise, whether occupational or recrea- (Cullumbine 1949j). Therefore there is here a y compensating factor in that the poor often have harder to obtain a living, and hard work increases unctional fitness. Their inferior nutritional status mit the improvement produced in this way, but portant to recognise this secondary factor.

her progress in this type of "field physiology" bably depend on the elaboration of more sensitive s for assessing dynamic fitness. The first attempts ss fitness concentrated on body build, muscular ment, and strength (Sargent 1903, Martin 1921). the emphasis moved to a measurement of the cardiovascular state (Meylan 1913, Crampton 1915, er 1920, and others). At about the same time, nse to the needs of the Services for fitness tests g personnel, "respiratory efficiency" tests were d (Flack 1921, Schneider 1921). Most of these ere of limited value because they ignored the c aspects of fitness, and it was only later that al tests, involving measurement of the physio- response of people to standard exercise, were ced.

treadmill is probably the best apparatus for l laboratory investigations, since the technique ly acquired and the true work efficiency remains t (Taylor and Brozek 1944). It is, however, ly costly and is unsuitable for field work. The l step test, which requires only a stool and little at present the most useful test for field work. essment is based on the post-exercise pulse-rate. course, is not a new basis for a fitness test— nd Pembrey (1911), Foster (1914), Cotton et al. Hunt and Pembrey (1921), and Poulton and 1926), among others, used a similar criterion— Campbell (1925) indicated, most of these workers sidered the resting pulse-rate in their calculations, ended to give people with a high initial pulse-rate ntage. What we now require are reliable tests e of the other physiological characters, such as one and nervous and neuromuscular coördination.

SUMMARY

of the data obtained during a nation-wide survey eoples of Ceylon are summarised.

The influence of age, sex, race, muscular development, physique, anthropometric characters, resting cardiovascular state, respiratory efficiency, and gross environment on certain aspects of dynamic fitness is discussed.

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INFLUENCE OF HEART-RATE ON CARDIAC OUTPUT

STUDIES WITH DIGOXIN AND ATROPINE

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Withering (1785) was the first to show that digitalis often relieved dropsy and slowed the heart. Mackenzie (1910) found that cardiac œdema was greatest in cases of heart-failure due to valvular disease with auricular fibrillation; when digitalis removed the œdema the ventricular rate became much slower. His cases of heart-failure with sinus rhythm had less œdema and the improvement following digitalis was less apparent; only rarely was there conspicuous slowing of the heart-rate. This led Mackenzie to teach that digitalis exerted its most beneficial effect in cases of auricular fibrillation, and that cardiac slowing was an index of therapeutic benefit.

Lewis (1919) was even more strongly of the opinion that auricular fibrillation was the only indication for digitalis. He wrote: "There are few, if any, instances of which we know with certainty in which digitalis acts beneficially except cases of accelerated action; there are

TABLE I—EFFECT OF DIGOXIN ON THE HEART-RATE, CARDIAC OUTPUT, AND RIGHT AURICULAR PRESSURE IN PATIENTS WITH SINUS RHYTHM

Case	Diagnosis	Heart-rate per min.		% slowing	Cardiac output (litres/min.)		% increase in output	Right a pressure (saline sternal	
		Before	After		Before	After		Before	A
1	Hypertensive heart-disease	114	100	12·3	2·1	2·6	23·8	−4·0	-
2	" " "	87	80	8·1	2·1	2·5	19·0	+8·0	
3	" " "	74	72	2·8	3·1	3·4	9·7	0·0	-
4	" " "	88	80	9·1	2·6	3·3	27·0	+19·0	+1
5	" " "	120	108	10·0	3·1	4·5	45·0	+9·0	-
6	Syphilitic aortic disease; aortic incompetence; anæmia	92	88	4·3	4·0	4·3	7·5	−4·0	-
7	Mitral stenosis; aortic incompetence	98	88	10·2	4·4	4·5	2·3	−3·5	-
8	Mitral stenosis; anæmia	92	80	13·0	5·8	5·8	0·0	−4·0	-
9	Mitral stenosis	104	98	5·4	2·9	4·1	41·4	+6·5	-
10	" "	124	120	3·2	2·5	3·2	28·0	+21·0	+1
11	" "	84	84	0·0	3·2	3·2	0·0	+10·0	+1
12	Aortic stenosis	100	100	0·0	3·1	3·9	25·8	−2·5	-

few instances of acceleration in which the drug produces unquestionable benefit apart from those provoked by fibrillation of the auricles." This view was shared by many but not all of his contemporaries. For some years previously Wenckebach (1910) had maintained that the drug was of value in all types of heart-failure and that its use should not be restricted to cases with a quick and irregular pulse. He said: "If ever I should acquire a reputation for treating heart patients with success, it will be from my giving in this way digitalis where authorities and textbooks forbid it." Windle (1916) wrote of the value of digitalis in patients with dropsy and pulsus alternans due to myocardial and arterial disease. West and Pratt (1920) found that "in many [patients with heart-failure in sinus rhythm] the effects were quite as *gratifying as in those showing auricular fibrillation.*" Christian (1919, 1922) reported a series of 97 cases treated with digitalis. He found as satisfactory a response in cases with sinus rhythm, in which the pulse-rate remained unaltered, as in those with auricular fibrillation. Further clinical studies by Luten (1924) and by Marvin (1926) indicated that the response of the failing heart to digitalis was related more to the ætiology of the cardiac condition than to the rhythm or rate. They reported strikingly beneficial results in patients with hypertensive or ischæmic heart-disease, but a failure of response in those with rheumatic valvular disease in sinus rhythm who had progressed to the stage of persistent œdema. Luten stated that "slowing is not a characteristic attendant on improvement and even when it occurs it is a result rather than a cause of the improvement." Gavey and Parkinson (1939) also concluded that digitalis was indicated in congestive cardiac failure irrespective of the rhythm. They claimed a parti value for the drug in rheumatic valvular disease ac panied by auricular fibrillation; but statistical an of their results does not show a significant diffe between the responses of patients with sinus rh and those with auricular fibrillation.

The development of the technique of cardiac c torisation has brought further information on pharmacological action of t [illegible] studies by McMichael and [illegible] by Ahmed et al. (1949) have shown that digoxin ouabain increase the cardiac output in patients failure due to hypertensive, ischæmic, and val heart-disease. In the course of the earlier observat McMichael and Sharpey-Schafer noted that 6 pat *with auricular fibrillation* showed a response to dig similar in degree to that observed in those with rhythm, but apart from this there is little referenc the relation between increase in cardiac output decrease in heart-rate. The following observations made in order to determine whether cardiac slo plays an important part in increasing the cardiac ou following digitalis therapy.

MATERIAL AND METHODS

Cardiac catheterisation was carried out two h after the midday meal by a technique similar to described by McMichael and Sharpey-Schafer (194 Patients not in cardiac failure lay flat; *those in fai* were propped up. The right auricular pressure recorded on a saline manometer and related to the l of the sternal angle which was taken as zero. oxygen unsaturation of 3 ml. samples of mixed ve

TABLE II—EFFECT OF DIGOXIN ON HEART-RATE, CARDIAC OUTPUT, AND RIGHT AURICULAR PRESSURE IN PATIENTS WITH AURICULAR FIBRILLATION

Case	Diagnosis	Heart-rate per min.		% slowing	Cardiac output (litres/min.)		% increase in output	Right auricu pressure (cm. saline above sternal angle)	
		Before	After		Before	After		Before	Aft
13	Hypertensive heart-disease	84	78	7·1	4·6	5·0	+8·7	+5·5	+1
14	" " "	91	82	12·9	2·9	2·9	0·0	+12·5	+12
15	" " "	96	84	12·5	3·3	4·2	+27·3	+6·0	0
16	" " "	110	82	25·4	2·4	2·9	+20·4	+3·0	−1
17	Mitral stenosis	160	120	25·0	2·5	3·3	+32·0	+8·0	+1
18	" "	125	112	10·4	4·5	5·0	+11·1	+0·5	−3
19	Mitral stenosis; aortic incompetence	108	96	11·1	1·9	2·0	+5·3	+16·5	+10
20	" " " "	155	95	38·7	2·3	3·8	+65·2	+7·5	−3
21	Mitral stenosis	118	91	20·3	3·1	3·4	+9·7	+5·0	−1
22	Mitral stenosis; anæmia	145	115	20·7	5·7	5·5	−3·5	+5·0	−
23	Mitral stenosis	162	142	12·4	3·2	3·7	+15·6	+8·0	+4
24	Mitral stenosis; Paget's disease	74	70	5·4	5·0	5·1	+2·0	+5·0	+
25	Aortic incompetence	128	98	23·4	3·1	3·2	+3·2	+5·5	+
26	Mitral stenosis	131	96	28·4	2·5	2·7	+8·0	+4·5	−1
27	" "	72	68	5·6	3·3	3·7	+12·1	+15·0	−10

terial blood was determined in a Haldane blood-paratus (Douglas and Priestley 1948). Oxygen iption was measured by spirometry.

xin, in doses of 0·75–1·5 mg. according to the weight patient, was given through the cardiac catheter to ients with failure due to hypertensive or valvular ; 12 had sinus rhythm and 15 auricular fibrilla-The effect of atropine alone, in intravenous doses mg., was studied in a further series of 20 subjects, r to obtain control data of its effects on normal thological circulations.

RESULTS

results are shown in tables I–IV and figs. 1

se to Digoxin

ents with Sinus Rhythm.—Of the 12 patients in oup (table I), 5 had hypertensive heart-disease and ular disease. In all but 2 of the 12 digoxin caused of the heart-rate, by 2–14 beats per minute. with hypertensive failure showed a rise in cardiac with a marked fall in right auricular pressure. 7 with valvular disease only 3 showed a significant output (10% or more); 6 showed a fall in filling re.

ents with Auricular Fibrillation.—Of the 15 patients group (table II) 4 had hypertensive heart-disease 1 valvular disease. In 3 of the hypertensive ts the cardiac output rose and the right auricular re fell, but in the fourth (case 14) there was no rise put and the right auricular pressure was unchanged. eart-rate slowed in all 4 cases. Of the patients valvular disease only half showed a significant se in output, despite a fall in right auricular re in all but 1 (case 25). The heart-rate slowed by beats per minute in these patients whether the c output increased or not.

increase in cardiac output may not necessarily pany clinical improvement. Quite often a fall in s pressure occurs which is not associated with a cant rise in cardiac output (McMichael and Sharpey-er 1944a, and unpublished observations). The degree of cardiac slowing has therefore been plotted against the measured reduction of venous pressure (fig. 1). Neither in the patients with sinus rhythm nor in those with auricular fibrillation is there any correlation between the relief of congestion and the slowing in heart-rate.

Response to Atropine

Atropine alone was given to 20 patients, of whom 14 had apparently normal circulations, 3 had heart-block, 1 had mitral stenosis and auricular fibrillation without evidence of venous congestion, and 2 had congestive failure due to hypertension with sinus rhythm (table III). After the injection of atropine all responded with an acceleration in heart-rate, which appeared within one minute and reached its maximum in two minutes. The increase in rate was variable. No change in blood-pressure was noted. The usual response in normal subjects was a fall in right auricular pressure and an increase in cardiac output. These changes were fairly consistent, and one or two apparent exceptions in the table may well be accounted for by the random errors involved. In the small group of patients with heart-disease similar changes were observed—i.e., the cardiac output tended to increase and the venous pressure fell. While it would be unwise to claim that patients with cardiac failure would all be expected to respond in this manner, it is significant that atropine-induced acceleration did not lower cardiac output or increase congestion.

Atropine following Digoxin.—Previous studies by Ahmed at al. (1949) have shown that intravenous digoxin usually alters the cardiac output within 30–45 minutes. One hour was, therefore, allowed to elapse before giving atropine (table IV). The acceleration in rate was variable; the cardiac output either remained unchanged or showed a further slight rise above the level achieved by digoxin. The right auricular pressure usually underwent a slight fall or remained unchanged. In only 1 case did it rise by 2 cm. (case 18). There is no correlation between the degree of rate change and the magnitude of the cardiac output or venous pressure alteration.

ABLE III—EFFECT OF ATROPINE ON THE HEART-RATE, CARDIAC OUTPUT, AND RIGHT AURICULAR PRESSURE IN RECUMBENT SUBJECTS

Diagnosis	Heart-rate per min.		Cardiac output (litres/min.)		Right auricular pressure (cm. saline above sternal angle)		Remarks
	Before	After	Before	After	Before	After	
ormal circulation	96	128	11·6	12·0	−7·0	−7·0	..
" "	60	116	5·0	6·2	−5·0	−7·5	..
" "	80	120	7·7	9·6	−6·0	−8·0	..
" "	57	120	5·5	8·3	−6·5	−9·5	..
" "	64	80	5·1	6·3	−5·5	−8·5	..
" "	94	128	9·7	12·0	17·5	16·5	R.A.P. above post. surface of back
" "	60	116	5·0	6·2	12·5	11·0	" " " "
" "	72	114	4·2	4·5	14·5	10·5	" " " "
" "	86	104	5·2	6·9	15·0	14·0	" " " "
" "	60	108	5·6	7·9	−4·0	−7·0	..
" "	92	128	5·0	6·0	−6·5	−6·5	R.A.P. prevented from falling by intravenous infusion of saline
" "	84	105	4·4	5·7	−4·0	−7·0	..
" "	84	120	7·7	11·2	−2·5	−4·5	..
" "	64	80	5·1	6·3	−5·5	−7·5	..
Average:	Acceleration of 37 beats/min.		Increase of 1·6 litres/min.		Fall of 2 cm. saline		
omplete heart-block	26	34	4·0	4·5	−6·5	−5·5	No congestive failure
omplete heart-block; aortic incompetence	44	52	4·8	5·9	−0·5	−5·0	" "
:1 heart-block; ischæmic heart-disease	42	56	4·0	5·2	−2·5	−7·5	" "
ltral stenosis; auricular fibrillation	80	104	4·2	4·3	−5·0	−5·0	" "
ypertensive heart-disease	54	104	2·2	3·3	+7·5	+2·0	Congestive failure
" " "	104	116	3·8	4·0	+7·5	+4·5	" "

TABLE IV—EFFECT OF ATROPINE FOLLOWING DIGOXIN ON HEART-RATE, CARDIAC OUTPUT, AND RIGHT AURICULAR PRESSURE

Case	Diagnosis	Heart-rate per min.		Cardiac output (litres/min.)		Right auric pressure (cm. above sternal	
		Before	After	Before	After	Before	Aft
	Sinus Rhythm						
1	Hypertensive heart-disease	100	128	2·6	3·1	−9·0	−1
3	" "	72	81	3·4	3·4	−6·0	−
6	Syphilitic aortic disease; aortic incompetence; anæmia	88	108	4·3	4·5	−7·5	−
7	Mitral stenosis; aortic incompetence	88	114	4·5	4·7	−6·0	−
8	Mitral stenosis; anæmia	80	120	5·8	6·2	..	..
	Auricular Fibrillation						
14	Hypertensive heart-disease	82	112	2·9	3·1	12·0	1
16	" " "	82	120	2·9	2·9	−1·0	−
18	Mitral stenosis	112	145	5·0	4·9	−3·5	−
22	Mitral stenosis; anæmia	115	150	5·5	5·5	0·5	
23	Mitral stenosis	142	161	3·7	4·5	4·5	
24	Mitral stenosis; Paget's disease	70	116	5·1	5·6	2·0	−
26	Mitral stenosis	96	104	2·7	2·7	1·0	
27	" "	68	90	3·7	3·8	10·5	

DISCUSSION

Figs. 1 and 2 indicate that in chronic heart-failure digoxin produces a response which, measured by cardiac output and by venous-pressure changes, bears no relation to the degree of slowing achieved. Further, the rise in cardiac output is as pronounced in cases with sinus rhythm as in those with auricular fibrillation. In some cases of auricular fibrillation the ventricular rate slows considerably but cardiac output does not rise; others with sinus rhythm may respond excellently with little or no change in rate. Slowing is more conspicuous in auricular fibrillation but does not appear to play any part in improving the cardiac output. The output seems to increase equally well whether the initial ventricular rate is fast or slow; this holds irrespective of the rhythm.

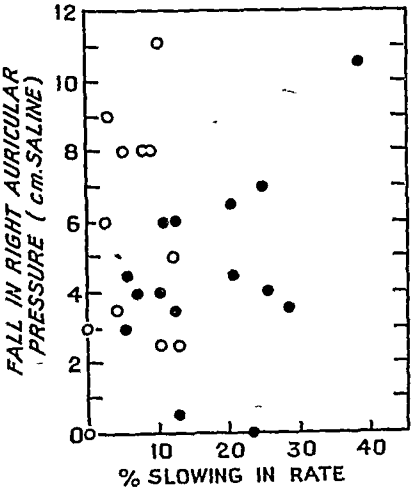

Fig. 1—Responses to digoxin. Open circles, sinus rhythm; dots, auricular fibrillation. There is a greater degree of slowing in fibrillation than in sinus rhythm, but there is no significant difference in the relief of venous congestion in the two groups.

These observations supplement the modern views on the clinical use of digitalis which date from Wenckebach (1910) and Christian (1919, 1922), and are contrary to the older teaching of Mackenzie (1910), Lewis (1919), and Sutherland (1919). The fact that atropine can reverse the slowing effect of digoxin, without lowering the cardiac output to the level which existed before digoxin was given, is further evidence of the unimportance of rate change in digitalis therapy. It may be, as Luten (1924) suggested, that a tachycardia in failure is purely an adaptative mechanism of an embarrassed circulation, and that as the circulation improves the heart slows secondarily.

It is to be noted that the above observations covered only an hour or two, and it is possible that clinical responses over a longer period might be different. But the clinical studies of Christian (1919, 1922) and Gavey and Parkinson (1939) do not suggest that the long-term clinical results in sinus rhythm and auricular fibrillation differ significantly. It would be difficult to assert that in mitral stenosis the onset of auricular fibrillation no part in making the situation worse. On the hand, auricular fibrillation may have no delete effects in otherwise healthy hearts (Hanson and Rut 1949).

The opinion that digitalis is of particular val auricular fibrillation may be due partly to the fact slowing of the heart-rate provides a convenient ind effective dosage. This dosage indicator is lacki patients with sinus rhythm, who while undergoing continued digitalis therapy are more liable to almost imperceptibly between a state of digitalis dosage and underdosage. This readily create impression that the drug is of less value in sinus rh than in auricular fibrillation.

SUMMARY

When digoxin is given in cardiac failure the r cardiac output is as pronounced in patients with rhythm as in those with auricular fibrillation.

There is no relation between the degree of slowin the increase in cardiac output; relief of venous cong is also independent of the degree of slowing. Im ment in ca output is e probable w the initial cular rate i or fast.

In normal atropine ac tion is accom by a fall in auricular p and a rise in c output. P with heart- showed esse similar resp There was n dence that ac tion so in either dep cardiac out increased congestion.

Given aft oxin in fibr hearts, atrop reverse the effect wi countera either the

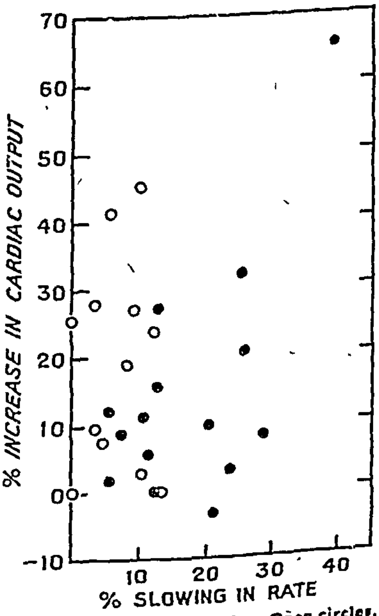

Fig. 2—Responses to digoxin. Open circles, sinus rhythm; dots, auricular fibrillation. There is a greater degree of slowing in fibrillation than in sinus rhythm, but there is no significant difference in the cardiac output responses of the two groups.

c output or the fall in venous pressure caused goxin. Similarly in patients with sinus rhythm ne acceleration has no adverse effect on cardiac t or venous pressure after digitalisation.

presence or absence of cardiac slowing plays no rable part in producing the immediate hæmo- aic improvements following digitalisation.

e of the data given above were obtained by Prof. A. D. ield, Dr. Sheila Howarth, Prof. J. McMichael, and E. P. Sharpey-Schafer, to whom we are indebted. We like to thank Professor McMichael for his help and agement.

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URCE OF TWO HOSPITAL-INFECTED CASES OF TETANUS

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o patients who had received surgical treatment in ame hospital developed tetanus in May, 1949.

se 1.—A married woman, aged 60, first attended hospital ug. 3, 1948, with a fracture dislocation of the ankle. was treated in plaster and later became displaced. rly October open reduction was done and treatment in r was continued until Jan. 20, 1949. The operation ds healed uneventfully.

May 2, 1949, the patient was readmitted with intolerably al arthritis, and arthrodesis of the ankle was done in ain theatre suite (theatre 1) on May 4. Postoperatively patient developed a thrombosis of the main vessels e calf, and on May 6 an operation was done to explore decompress the leg. Circulation returned, and after a ing had been done on May 17 the patient's general tion greatly improved. No other dressings were rmed.

May 19 trismus developed, and spasm of the neck and geal muscles rapidly followed. Tetanus was diagnosed, n spite of anti-tetanus serum and hypnotics the patient on May 23.

cteriological examination of the wound at the time of leath did not reveal tetanus or other clostridia. It was ght probable that the infection had been introduced e operation on May 4, after which the conditions were that growth of these organisms in the wound would bly have been encouraged. The latent period was about fifteen days.

se 2.—A man, aged 52, sustained in January, 1948, a re fracture of the left tibia and fibula. Open reduction done. Subsequently, after an injury in plaster, the nd became septic. On April 26, 1949, the leg was utated below the knee through a relatively healthy area; was done in theatre 1. The wound was left open, secondary re being done on May 1 with one draining tube. The nd healed uneventfully and the patient was discharged May 20. The wound was dressed several times in this .

n May 25 the patient attended the outpatient department plaining of difficulty in opening his mouth and of pain stiffness of the neck. Tetanus developed, from which ecovered.

acteriological examination of a tiny area of the amputation np which remained unhealed did not reveal tetanus bacilli or other clostridia. The most likely time for infection to occur would have been when the wound was closed on May 1, 1949—i.e., within three days of the operation on case 1. This would give a latent period of twenty-four days.

In neither case was catgut used, the surgeon having used sterilised silk for all sutures.

THE OPERATING-THEATRE AS A POSSIBLE SOURCE OF INFECTION

The main theatre suite is situated on the top floor of a four-storied building and consists of two theatres communicating through a central assembly room. Attached to each theatre are the usual anæsthetising-room and sterilising-room (see figure). The ceiling of theatre 1 collapsed on Nov. 20, 1948, and towards the end of February, 1949, building repairs were begun. These were completed on April 16, when this theatre (henceforth referred to as the theatre-in-use) was reopened for surgery. On April 18 building reconstruction was begun on the adjoining theatre 2 (henceforth referred to as the theatre-under-repair), the assembly room, and the annexes, and was in progress when the cases of tetanus arose.

During this time large amounts of building materials were being used in the theatre-under-repair; these included cement and plaster, the latter containing animal hair. In addition, this material, which will be referred to as plaster-hair, was present in bulk in several sacks. The plasterers beat the hair with laths on a table before mixing it with the plaster, in which it acts as a binding material. The rooms in which building and plastering were in progress contained a thick layer of dust in which this plaster-hair was present. It seemed possible that the abnormal quantity of dust contaminated with animal hair was a potential source of tetanus spores.

Theatre Ventilation

The ventilation of the theatre suite (see figure) was produced by two independent fan-driven exhaust units. The two air outlets (O_1 and O_2 in the figure) were situated on the outside walls of the theatre; each communicated with an independent system of air ducts and vents (V_1 and V_2 in the figure) and drew air from each theatre and its sterilising-room and anæsthetising-room into the open air outside. This produced various currents of air throughout the theatre suite, some of which amounted to draughts. The air drawn into the theatre suite came up the lift shafts and stairway.

During the repairs only the air ventilation of the theatre-in-use was in operation. A trial run of this unit showed that strong currents of air were created, including cross-currents from the theatre-under-repair which contained large quantities of dust. Dust from this location must therefore have been drawn into the theatre-in-use and its various annexes while the ventilation unit was working.

BACTERIOLOGICAL INVESTIGATION

The bacteriological investigation was therefore conducted to answer the following questions:

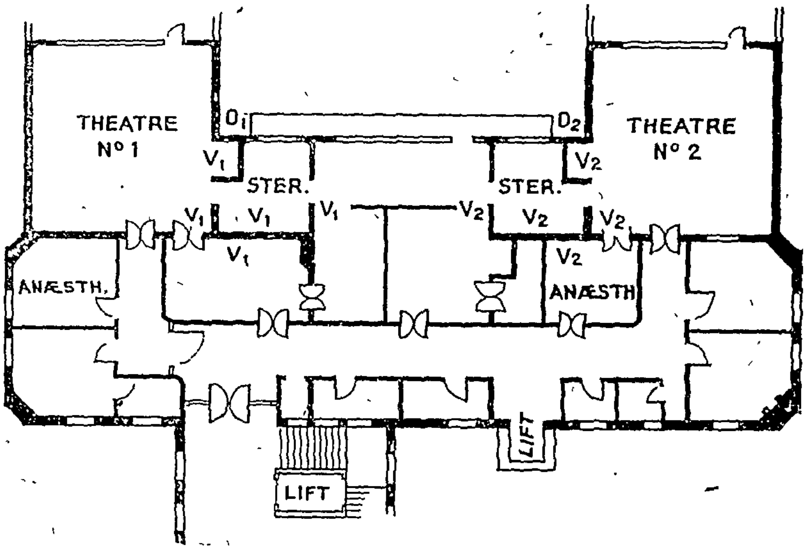
(1) Did there exist within the theatre suite a potent source of tetanus spores? The plaster-hair was a likely example of such a material.

(2) If tetanus spores were present within the theatre, where were they mainly concentrated, and how widely were they disseminated?

(3) Were the operating-materials, such as silk sutures, talcum powder, gloves, and dressings, contaminated with tetanus spores?

The following specimens or swabs were therefore collected and examined bacteriologically:

(1) Fourteen swabs from various areas of the floor and walls of the theatre-in-use and its anæsthetics-room, the theatre table and table rubber, and the anæsthetics trolley.



Plan of main theatre suite: O_1, O_2, outlets of fan-driven exhaust ventilators; V_1, V_2, air vents in theatre and annexes.

(2) Specimens of dust swept from the main corridor of the theatre, and dust from two parts of the theatre-under-repair and its sterilising-room.

(3) Samples of air from the theatre-in-use, the theatre-under-repair, and the central assembly room. These were collected by an apparatus constructed to bubble air through 200 ml. of Brewer's thioglycolic-acid broth contained in a 500 ml. triangular flask. Each sampling lasted half an hour, and it is estimated that about 30 c. ft. of air was bubbled through in each sample. During the sampling no operations were being done, but building was in progress. The flasks of broth were heated to 90°C for ten minutes and incubated for seven days.

(4) Four samples of the plaster-hair removed from sacks of this material.

(5) Samples of sterilised silk sutures, swabs of the exterior of sterilised rubber gloves, samples of sterilised cotton-wool, two samples of talcum powder before autoclaving, and two samples of talcum powder already autoclaved and ready for use.

Methods

The various swabs and samples of dust, hair, silk sutures, cotton-wool, and talcum powder were plated directly on to 2% horse-blood agar plates, both aerobically and anaerobically, and inoculated into Robertson's cooked-meat broth. The cooked-meat cultures were examined after 2, 7, and 14 days' incubation. Duplicate subculture was made on to blood-agar plates, which were incubated aerobically and anaerobically, sometimes after heating a portion of the culture to 80° or 90°C for 5–15 minutes. Aerobic bacteria, such as micrococci, diphtheroids, and streptococci, and aerobic sporing bacilli (*Bact. subtilis* group) were identified by the usual methods. Special attempts were made to isolate anthrax bacilli from the plaster-hair by cultural methods and to produce anthrax by inoculation of hair washings into guineapigs.

Difficulty was encountered in ob pure cultures of the anaerobic s bacilli. The technique of subcul the cooked-meat cultures on to 2% blood agar, which was done in the stages of the investigation, was soon up, because with this concentrat agar many clostridial colonies sprea the surface of the plates. Bloo containing 6% of agar was the used,[1] and pure cultures were o by subculture from the cooke cultures on to these 6% bloo plates. The plates were incubated a bically, and subsequent colonies picked into cooked-meat media. process was repeated several tim each strain.

Identification of *Clostridium teta* based on its characteristic dru appearance when sporing; limite teolytic properties in cooked-meat, and serum media; colonial charact (spreading growth, &c.); product indole in peptone water; and inability to fermen sugar media, &c. Finally, toxigenicity was determi (1) the production of fatal clinical tetanus in mice lated with broth cultures to which calcium chlori been added, and (2) the protective action of liminary injection of tetanus antitoxin in ot similarly injected animals.

Other members of the clostridia group were is and 24 strains were examined. The investiga these organisms included the morphology, in pa the shape and position of the spores and motility teolytic action in cooked-meat broth, nutrient coagulated serum, and coagulated egg media; sac lytic properties in iron-sugar peptone-water medi taining glucose, maltose, mannite, lactose, sacc or salicin); production of indole in peptone Nägler reaction; action on litmus milk, &c. attempts were made to produce gas-gangrene in pigs by the intramuscular inoculation of broth c of ten of the strains isolated. To these cultures a s of calcium chloride was added.

RESULTS

The results of the anaerobic cultures are sumn in the accompanying table.

Air Sample.—No anaerobic bacteria were isolate the air of the theatre suite.

Theatre-under-repair and its Sterilising-room.—Th from both of these rooms contained *Cl. teta* various other strains of clostridial organisms, inc *Cl. sporogenes.*

RESULTS OF ANAEROBIC CULTURES

Theatre-under-repair			Theatre-in-use				
Operating-room	Sterilising-room	Plaster-hair	Main corridor	Operating-room	Talcum powder		Cotton-wool, silk sutures, rubber gloves after autoclaving
					Before sterilisation	Autoclaved	
Cl. tetani, *Cl. sporogenes*, *Cl. histolyticum*, *Cl. bifermentans*, and others	*Cl. tetani*, *Cl. sporogenes*, and others	*Cl. tetani*, *Cl. sporogenes*, *Cl. histolyticum*, *Cl. bifermentans*, and others	*Cl. tetani*, *Cl. sporogenes*, *Cl. bifermentans*, and one other	Oval terminal-sporing anaerobe	*Cl. tetani*, *Cl. sporogenes*, *Cl. histolyticum*, and others	*Cl. tetani*, *Cl. sporogenes*, *Cl. histolyticum*, and others	Sterile

Cl. histolyticum, *Cl. bifermentans*, and other strains produced necrosis and liquefaction of muscle when injected into guinea-p

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1. Hayward, N. J., Miles, A. A. *Lancet*, 1943, ii, 11

ster-hair.—This material contained very large pers of various kinds of bacteria, including varieties erobic sporing bacilli and micrococci. Anthrax li were not isolated, nor was anthrax produced in apigs by inoculation of hair washings. In the ed-meat cultures a heavy mixed growth of anaerobic ng bacilli was obtained within forty-eight hours. these cultures strains of toxigenic *Cl. tetani* were ted. Among the various other anaerobes present *bifermentans*, *Cl. sporogenes*, and *Cl. histolyticum* identified, but others were also present. Several of naerobes from the hair and from the other sources uced necrosis, liquefaction, and œdema of muscle out killing the guineapigs. Moreover, when the rifuged deposit of washings from the hair was inocu-l into the thigh muscles of two guineapigs, a large of muscle necrosis developed, and in one guineapig efaction of the muscle and pus formation took place. ure of the muscle and pus produced heavy growths naerobic sporing bacilli.

ain Corridor of Theatre.—The dust examined yielded ms of *Cl. tetani*, *Cl. bifermentans*, *Cl. sporogenes*, and her clostridial strain.

heatre-in-use.—From the operating-room large num- of aerobic sporing bacilli and various micrococci obtained from every swab of the floor and walls. ddition, one swab yielded coliform bacilli, and from ther an oval subterminal anaerobic sporing bacillus grown.

heatre Table and Table Rubber.—Heavy growths of bic sporing bacilli and various micrococci were ined. From the table rubber a diphtheroid bacillus a non-hæmolytic streptococcus were also isolated, these were probably of human origin. No anaerobic teria were found.

terilised Silk Sutures and Cotton-wool, Swabs of oclaved Rubber Gloves.—Cultures were sterile.

alcum Powder (Glove Powder).—Four specimens of um powder were cultured, two before sterilisation two already autoclaved and ready for use. From unsterilised specimens several varieties of anaerobic ring bacilli were cultured, including *Cl. sporogenes*, from one specimen *Cl. tetani* was isolated. The oclaved specimens yielded three varieties of clostridia, which *Cl. tetani* and *Cl. sporogenes* were identified. n-sporing bacteria were not isolated.

t was obviously important to discover whether the um powder had been contaminated in the theatre te or had arrived already contaminated from the pensary. Accordingly specimens of the stock dispensary um powder were cultured. A few aerobic sporing illi and staphylococci were found, but anaerobic ring bacilli were not isolated. Further specimens talcum powder before and after autoclaving were ained from the operating-theatre in the casualty partment. This theatre is located on the ground floor the hospital and is some distance from the main theatre te, and its autoclaving is done in a separate depart-ent. Both of these specimens of talcum powder mained sterile. The failure to culture anaerobic oring bacilli from these specimens of talcum powder ggested that the main theatre talc had been con-minated within the theatre. If this were so, it was nportant to find out why the autoclaved cotton-wool and ubber gloves were sterile, the latter autoclaved only t 5 lb. steam pressure for ten minutes, whereas talcum owder after autoclaving at 20 lb. pressure for twenty minutes still contained spores.

Questioning of the theatre staff revealed that the nethod of packing the talcum powder had been changed, probably in April, 1949. Previously the powder had been packed in "pepper-pots" before sterilisation; but, owing to a shortage of these, the talc was now packed in flat packets of gauze, each containing a teaspoonful of powder. These were not wrapped in paper, and numerous talc-containing pieces of gauze were packed side by side and on top of one another in a metal drum. Inspection showed that it was a drum three-quarters full of talcum powder containing many pieces of gauze. It seemed that sterilisation by autoclaving would be relatively ineffective, since the air would be slow to leave and steam slow to enter, and consequently the temperature of the talcum powder would not rise sufficiently to destroy the spores of bacteria. A test was carried out to see if this were so. A small sterilising drum was three-quarters filled with pieces of gauze each containing a teaspoonful of talc, and a piece of gauze contaminated with cultures of *Bact. subtilis*, *Bact. coli*, and *Staph. aureus* was marked and placed in the centre of the drum. This was autoclaved in the laboratory at 20 lb. pressure for 20 minutes. Culture of the marked piece of gauze showed that the staphylococcus and *Bact. coli* had been killed, but that the *Bact. subtilis* had survived the autoclaving. In other words, the temperature reached in the centre of the drum was insufficient to kill these spores.

DISCUSSION

Summarising the findings, anaerobic sporing bacilli of the clostridial group were isolated from one swab of the floor of the theatre-in-use, from the dust of the main corridor of the theatre suite, from the dust of the theatre-under-repair and its sterilising-room, from the plaster-hair, and from specimens of theatre talcum powder before and after autoclaving. All the plaster-hair specimens gave a very heavy and rapid growth of these organisms. Toxigenic strains of tetanus bacilli were isolated from all these sources except the theatre-in-use. Some of the other anaerobic bacteria were potential producers of gas-gangrene. Samples of sterilised silk, cotton-wool, and swabs from autoclaved rubber gloves were sterile.

Plaster-hair

Several sacks of hair were present in the theatre-under-repair. Because of its animal origin it was the most likely material to contain clostridial spores, and in fact did so. No other material was discovered in the theatre suite which, because of its nature or source, was likely to contain these spores. The plasterers pulled this hair apart and beat it with laths in the theatre-under-repair, thereby certainly contaminating the atmosphere and dust of that theatre. It was therefore concluded that the plaster-hair was the source from which the tetanus and other anaerobic bacteria were disseminated. In other words, had this hair not been admitted to the theatre, tetanus spores would probably not have been isolated from the other sources.

The plaster-hair which had been used was traced to the packers and processors, who stated that it was blended goat-hair obtained from tanneries in various parts of Britain, that the hair was pulled from skins which had been treated by the "lime and chemical" process, and that they believed that the hair used was from goat skins of Abyssinian origin. The implications of the use in industry of hair containing the spores of anaerobic organisms is being investigated separately.

Theatre Ventilation

It has been mentioned that the exhaust system of the theatre ventilation produced cross-currents within the theatre suite and would disseminate dust situated in one part of the theatre throughout the suite. Dust in the theatre-under-repair, contaminated with tetanus and other spores from the plaster-hair, could easily have been disseminated in this way. This would explain the finding of such bacteria in different parts of the theatre suite and in the talcum powder.

Ventilation systems of this type, introduced into operating-theatres during the last fifty years were designed to get rid of the steam from the sterilisers and in general to make the theatre comfortable for the staff—particularly the surgeon—to work in. Admirable though this purpose is, the problem of adapting the ventilation to suit the patient's needs, and in particular to minimise wound infection arising in the theatre, was not considered seriously until recently. Bourdillon and Colebrook[2] designed and introduced for the treatment of burns an air-conditioned dressing-station into which filtered, warmed, and humidified air was passed. The forced-ventilation plant used was designed "to ensure an atmosphere almost free from bacteria at the start of the dressings and to cause rapid evacuation of organisms disseminated through the air in the course of each dressing." The incidence of added infection due to hæmolytic streptococci, *Ps. pyocyanea*, and *Proteus* among the burned patients was greatly reduced after the introduction of this dressing-station.[3, 4] It is likely that the incidence of added infection in surgical wounds would equally decline if ventilation systems designed to control the hygiene of the air were generally introduced into operating-theatres. Moreover the dissemination of tetanus spores and the infection of two patients with tetanus, which gave rise to this present investigation, would not have happened. It may be argued, however, that the plant and theatre reconstruction required for the hundreds of operating-theatres in the country would be too costly. This argument is reminiscent of that used in Lister's time against the general introduction of expensive sterilising equipment into theatres. But autoclaves and sterilisers are now in general use, and no surgeon of the present day would operate with unsterile instruments or gloves.

Talcum Powder: the Vehicle of Infection

The presence of various clostridia, including *Cl. tetani,* in the autoclaved talc was considered highly significant. A similarly contaminated powder would probably have been used by the surgeon to dust his hands before gloving and was likely to have entered the patients' wounds. For this reason the talc is considered to have been the final vehicle of contamination with tetanus spores. Airborne dust containing tetanus spores cannot be excluded, but it seems a less likely vehicle of infection.

There are several lessons to be learnt from the unsterile though autoclaved talcum powder. First, talcum powder should be packed in small quantities, and the packets should be well separated from one another in the drum container; this will allow the easy removal of air during the autoclaving and the easy entry and circulation of superheated steam. Secondly, non-sterile talcum powder should not be used to dust rubber gloves, mackintoshes, &c., since these are normally autoclaved at only 5 lb. pressure to prolong their life; the dusting should be performed with talcum powder which has already been autoclaved at 20 lb. pressure. Finally, the efficiency of autoclaving should be bacteriologically controlled with a selected suspension of *Bact. subtilis,* in the most tightly packed drums.

SUMMARY

A bacteriological investigation into a hospital source of two cases of tetanus is described.

Building repairs were being done on part of the theatre suite, and here animal hair was being mixed with plaster powder. The hair gave a heavy growth of various strains of anaerobic sporing bacilli, including toxigenic strains of *Cl. tetani.* Some of the other strains produced experimentally muscle gangrene in guineapigs.
plaster hair is considered to have been the original sou
of the tetanus infection.

From dust or floor sweepings of various parts of t
theatre suite and from specimens of talcum powd
(glove powder) toxigenic strains of tetanus and oth
anaerobic sporing bacteria were isolated. This is thoug
to have been the result of dissemination of spo
containing dust originally contaminated from t
plaster-hair.

The dissemination was probably brought about
cross-currents of air in the theatre, and these w
produced by exhaust ventilation in the theatre suite.

Clostridial strains, including toxigenic *Cl. tetani,* we
isolated from talcum powder autoclaved at 20 lb. pressu
and ready for use. This imperfect sterilisation w
considered to have arisen from the tight packing of t
powder packets in the sterilising drum. The contaminat
talc (glove powder) was probably the final vehi
whereby tetanus spores reached the patients' wounds.

Some of the implications are discussed, and
recommendations on theatre ventilation and steri
of talcum powder are made. In particular the
installation into operating-theatres of plenum
ventilation systems designed to control the air h
of the theatre suite is advised.

I wish to thank Prof. J. C. Cruickshank, of the School of Hygiene, for confirming the identity of se
strains of *Cl. tetani*; to Mr. L. Nelson for technical assistan
and to my surgical colleagues for their cooperation
support.

NON-TRAUMATIC THROMBOSIS OF TH CAROTID ARTERY

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TRAUMATIC thrombosis of the internal carotid arte
has been known since 1872, when Verneuil described
case with right hemiplegia and aphasia, which wa
attributed to direct cerebral injury until necropsy reveale
thrombosis of the internal carotid artery and its branche
Many other cases have been reported since, but n
cases of non-traumatic thrombosis had been diagnose
until Egas Moniz introduced angiography of the cerebra
arteries. In 1937 Egas Moniz et al. reported 4 cases o
non-traumatic thrombosis of the internal carotid arter
among 537 patients submitted to angiography. Fro
that time numerous cases have been reported fro
Germany, Scandinavia, and Portugal, the most notab
being 9 described by Andrell (1943), who collected 2
from the literature. Later Egas Moniz (1947) added 1
further cases when he published his monograph on this
subject; Taptas and Pecker (1948) reported 5 cases
and Wolfe (1948) collected 32 published cases and adde
1 of his own.

We describe here 6 cases of thrombosis of the intern
carotid artery, including 1 in which the common caroti
artery also was thrombosed—a condition which seems t
be previously unreported.

CASE-RECORDS

Case 1.—A man, aged 41, was admitted under Prof. Brod
Hughes on Aug. 1, 1946. In November, 1945, he had giv
a pint of blood as a donor. Four days later he complained o
headache and dizziness. One and a half hours after the ons
of the headache a friend walking home with him noted th
his speech was peculiar. Soon after reaching home the pati
lost consciousness and remained unconscious for three wee
A right hemiplegia was found, and on regaining consciou
three weeks later the patient had dysphasia. Lumbar punc

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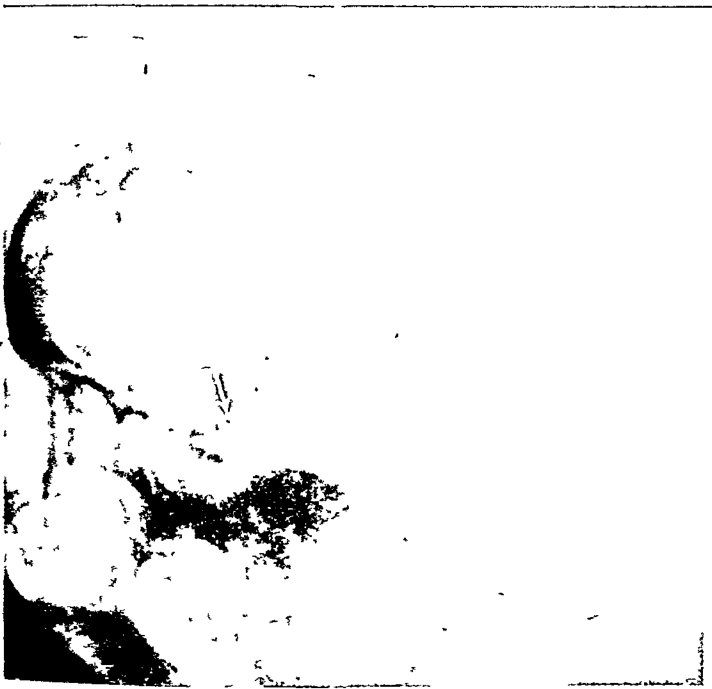
2. Bourdillon, R. B., Colebrook, L. *Lancet,* 1946, i, 561, 601.
3. Colebrook, L., Duncan, J. M., Butterfield, W. J. H. *Ibid,* 1947, i, 321.
4. Colebrook, L., Duncan, J. M., Ross, W. P. D. *Ibid,* 1948, i, 893.



1—Occlusion of internal carotid artery in its intracranial course, showing irregularity lumen. Branches of external carotid artery are well shown and seem to be larger in normal. (Case 2.)

ie day of onset produced a much bloodstained cerebro-l fluid (C.S.F.). Six weeks after the onset power began to n in the right leg and arm.

giography.—On Aug. 6, 1946, arteriography, through the ion carotid artery at the level of the cricoid cartilage, ed no filling of the internal carotid, but all the branches e external carotid were shown.

gress.—Ten months later, when seen in the outpatient tment, the patient had improved in his speech and could well, though there was little change in physical signs. years after the original trouble his speech was normal, is hemiparesis was still present.

se 2—A man, aged 57, was admitted under Prof. P. C. P. e on April 16, 1948. Fifteen months previously a weak-of the right leg had developed; this had improved but was still present. nth before admission he noticed weak-of the right arm and numbness down the surface of the same forearm, followed ek later by numbness of the right side e face. Five and a half years before d had an attack of coronary occlusion here had also been intermittent claudica-n both legs.

examination he had a motor and sensory hasia, and a right hemiparesis in which ace was also involved, with impairment rtical sensation on the right half of the . Examination of the fundi showed the edges to be slightly blurred, the veins rged, and the arteries small. There no pulsation in the dorsalis pedis and iteal arteries of either leg. The blood-sure was 180/95. Lumbar puncture luced C.S.F. under a pressure of 105 mm., a normal rise and fall on jugular com-sion, and normal cytology and chemistry. tro encephalography showed gross abnor-ity, greatest in the left frontal region. The ssermann reaction was negative.

ngiography of the left common carotid April 25, 1948, showed very good filling the external carotid circulation. The rnal carotid was filled as far as its bifurca-into the middle and anterior cerebrals, the lumen of the vessel in its intra-nial portion was very much narrower than normal and varied considerably in different parts. In its intradural portion the artery was straightened and appeared to end abruptly, but there was some filling of the sylvian group, and the appearances suggested a lesion of the wall of the artery in its intracranial portion, with partial occlusion. These appearances might represent canalisation following thrombosis. Angiography was repeated twice and the same result obtained (fig. 1).

Case 3.—A man, aged 58, was admitted under Dr. Ernest Bulmer on June 25, 1948. In May, 1948, his wife had noticed that he was dragging his right foot. Next day his right arm became weak. A month later a transitory speech defect developed, which soon passed off but was superseded in a week by a severe dysphasia, which persisted until admission.

On examination the patient could not speak properly, the most constantly reiterated sound being ' no " The left pupil was smaller than the right and did not react to light, he was blind in this eye. The left central retinal artery was thrombosed. There was a right hemiparesis affecting face, palate, and tongue, in addition to the extremities. The blood-pressure was 150/100. Peripheral arterio-sclerosis was present. The serum Wassermann reaction was negative. Lumbar puncture produced C.S.F. under a pressure of 100 mm., with normal cytology and chemistry.

Angiography of the left common carotid artery on July 6, 1948, showed filling of the external carotid artery system only. To confirm internal carotid thrombosis, the carotid bifurcation was exposed; though there was normal pulsation in the external carotid, there was very little pulsation in the internal carotid at its origin. A needle was introduced into the internal carotid artery just above the bifurcation and 'Uriodone' was injected. Again only the external carotid circulation was shown. A clamp was applied on the external carotid artery, and 8 ml. of uriodone was injected into the internal carotid artery. This time no dye appeared in either the internal or the external carotid system, suggesting that the left internal carotid artery was blocked just above the level of injection (fig. 2).

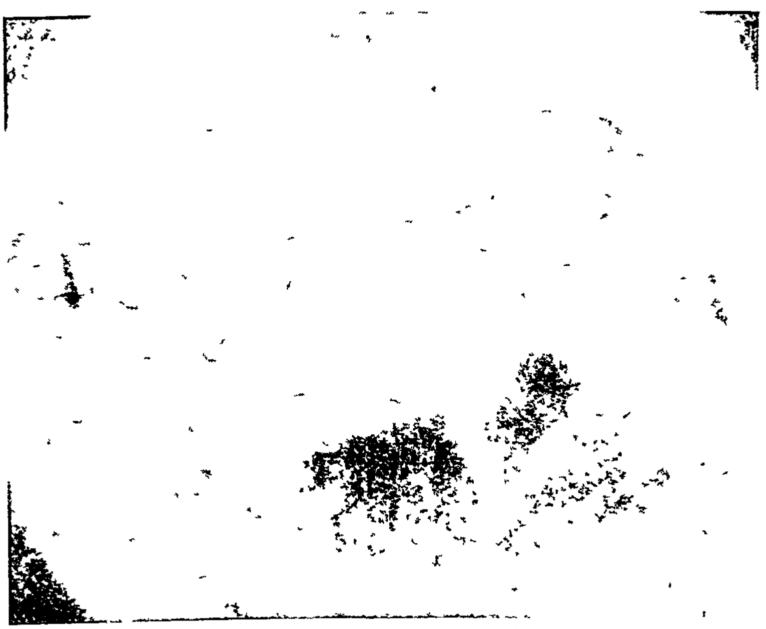


Fig. 2—No filling of internal carotid artery. Branches of external carotid are well shown. (Case 3.)

Case 4.—A man, aged 51, was admitted under Mr. J. M. Small on July 10, 1948 In 1942 he had begun to have increasing weakness and numbness of the right arm, which progressed until 1945 and then remained stationary. Towards the end of 1943 he had a "fainting attack" lasting a few minutes. From that time he had one of those attacks every two or three months. In 1944 he began to have difficulty with his speech. He could read and write but could not remember the words he wanted to say. His only other complaint was that he walked like a drunken man.

On examination there was no papillœdema. There was a right upper-motor-neurone facial weakness. There was clumsiness of the right hand but otherwise no weakness of the extremities. The Wassermann reaction of the blood and C.S.F. was negative. Lumbar puncture produced C.S.F. under an initial pressure of 110 mm., with normal cytology and chemistry.

Pneumo-encephalography (July 15, 1948) showed large subarachnoid spaces suggesting generalised cerebral atrophy, more extensive on the left side.

Electro-encephalography showed a considerable abnormality on the left side, with some evidence of a focus of abnormality in the posterior parietal region.

Angiography.—On July 20, 1948, the left common carotid artery was exposed for the purpose of angiography. The artery was much harder than normal and felt like a solid cord. There was no expansile pulsation, but a vertical movement of the artery synchronous with the pulse was noted. A needle was introduced into the artery, but no blood was obtained, and on removing the needle from the artery there was no bleeding. As the artery was followed upwards the transmitted vertical movement became less obvious, whereas when the artery was followed downwards the movement became more obvious. At this stage an assistant, asked to feel the temporal pulsation, could feel none. When the face was uncovered it was seen that, though on the right side the temporal artery was enlarged and pulsating, on the left side no vessel was visible. Angiography of the right common carotid was then performed, and this showed normal internal carotid vessels on that side; some of the radio-opaque substance had also passed into the left anterior and middle cerebral arteries.

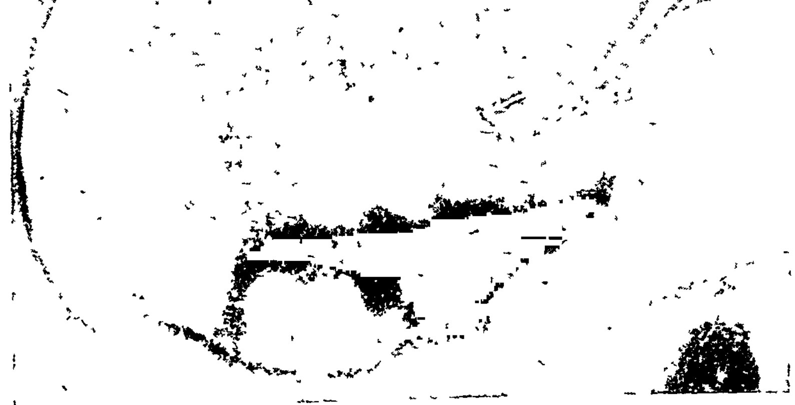


Fig. 3—Internal carotid artery very irregular and much narrower than normal. Sylvian group of vessels not well filled. Branches of external carotid artery all filled and much larger than normal. (Case 5.)

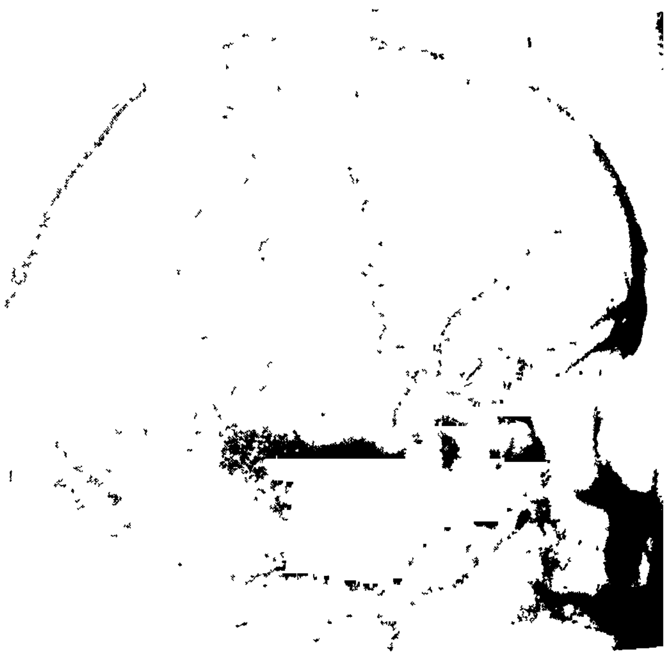


Fig. 4—Intradural part of internal carotid artery narrower than normal, straighten and ending abruptly. External carotid branches well shown. (Case 6)

Case 5.—A man, aged 48, was admitted under Mr Sm
on July 27, 1948. Fifteen weeks before admission he had
a cramp-like feeling in his left foot; this spread up to his
and trunk, and then into the third and fourth fingers of
left hand. Eleven weeks before admission he noticed that
was dragging his left foot, and then his arm and hand beca
weak. About eight weeks before admission the left side of
face was also involved.

On examination he had a left hyposmia. There was a
hemiparesis affecting the face as well as the extremities. Th
was increased tone on the left side of the body. All the tend
reflexes on the left side were increased, and the left plan
response was extensor.

Angiography (fig. 3) of the right common carotid (July
1948) showed that the internal carotid artery was very m
narrower in its intracranial portion and had an irregu
lumen. The middle cerebral vessels were shown, though
well filled. The external carotid branches
much larger than normally seen in comm
carotid angiography.

Ventriculography (Aug. 4, 1948) showed th
pressure was normal and there was
deformity of the ventricular system
patient's condition was thought to be due
incomplete thrombosis of the internal caro
artery.

Case 6.—A man, aged 57, was admit
under Mr. Small on Dec. 4, 1948. In 1
he had noted a tendency to catch his right f
while walking. Two months before adm
a tingling sensation developed over the ri
half of his body. No weakness of the hand
arm was noted, but there was a tendency
drop objects held in the right hand.

On examination a slight right facial we
ness was found; the motor power of the ri
arm and leg was diminished, though the t
was not increased. Tendon reflexes w
brisker in the right arm than in the l
The right plantar response was exten
Coordination of movements of the right ha
and right leg was impaired. The Wa
mann reaction was negative. Lum
puncture showed a clear fluid under 110
pressure, with normal rise and fall
normal cytology.

Pneumo-encephalography (Dec. 13, 1948
no evidence of shift or deformity of the lat
ventricles. The subarachnoid spaces w
larger than normal, especially on the left s

giography of the left common carotid (fig. 4) showed wing of the internal carotid artery in its intradural n, which came to an abrupt end at the point of its ation into the anterior and middle cerebral arteries. narrowed intradural portion of the artery was also mally straight. There was very good filling of the nal carotid circulation, and vessels of the scalp were on hole larger than seen in normal angiography.

ÆTIOLOGY

ncidence

ut of 33 cases of thrombosis known to have affected internal or the common carotid arteries (Andrell , Egas Moniz 1947, Wolfe 1948), as opposed to ler vessels, only 5 have been in females.

incidence

the 33 cases under review the age-incidence in rent decades was as follows: 1 case in the second de; 4 cases in the third: 2 in the fourth; 11 in fth; 14 in the sixth; and 1 in the seventh.

were on the left and 9 on the right.

ation

rombosis of the common and internal carotid ries has probably been diagnosed in the past as bral thrombosis, indicating thereby thrombosis of smaller cerebral vessels. It is only with the advent erebral angiography that the affection of the larger els has been recognised. There is no reason to suppose the ætiology of the two conditions differs greatly, gh in the limited series under review the pre- erance of cases in males and the greater inci- e on the left side differ from cerebral thrombosis softening, which is usually considered to occur lly between the sexes and between the two s of the brain (Jones 1909). As vessels of a larger re are involved, circulatory changes commonly ribed in medical textbooks, such as slowing of the lation in old age, and increased viscosity of the d in polycythæmia, probably play a lesser part, eas changes in the vessel wall are more important g., trauma, atheroma, syphilis, arteriosclerosis, mbo-angiitis obliterans, temporal arteritis, poly- itis nodosa, and aneurysm of the cerebral vessels.

gas Moniz (1947) says: “In the ætiology of carotid mbosis syphilis stands out as the most important, is followed by alcoholism, arteriosclerosis, and ctions (enteric fever, &c.), Buerger's thrombo-angiitis terans. traumatism, &c.” But it is difficult to agree h the order of importance of the ætiological factors n by Egas Moniz, who himself only mentions 1 case h a history of syphilis (but the Wassermann reaction hat case was negative). None of the 6 patients reported re had a positive Wassermann reaction or a history yphilis.

orgo (1939) believed arteriosclerosis to be the most ly cause of thrombosis of the internal carotid ry, and in at least 2 of our patients this seemed be so.

s regards thrombo-angiitis obliterans, case 2 had a tory of intermittent claudication, but the condition s probably not thrombo-angiitis obliterans but athe- ma, which also involved his coronary arteries. Sorgo cribes thrombo-angiitis obliterans in 1 case of throm- sis of the internal carotid artery, but arteriosclerosis as also present. Hausner and Allen (1938) found evi- nce of cerebral lesions in 2% of 500 cases of peripheral rombo-angiitis obliterans. Davis and Perret (1947) fer to 11 patients with cerebral thrombo-angiitis bliterans, 9 of whom underwent operation. Only 3 of hese 11 had evidence of peripheral circulatory disturb- nce, and, so far as can be judged from the report, none f them had thrombosis of the internal carotid artery. rof. Hilding Bergstrand, reporting on a section of the internal carotid artery from one of Andrell's (1943) cases, stated that the pathology was not unlike that of Buerger's disease, but there was no thickening of the intima.

Polyarteritis nodosa and temporal arteritis have played no part in the cases described above, but possibly, as these conditions become more widely recognised, they may prove to be of some ætiological importance. Professor Bergstrand, in a report on another case, stated that there was considerable inflammatory infiltraiton of round cells and leucocytes in the adventitia and periarterial tissue, but despite this he did not consider the picture to resemble that of polyarteritis nodosa.

Aneurysm could be a cause of thrombosis either by direct extension of the contained clot into the internal carotid artery or by pressure of the aneurysm on the artery. This may well have been the cause in case 1, where the presenting picture was one of subarachnoid hæmorrhage.

Trauma has not been considered here, but it is well to mention in passing that traumatic thrombosis may develop as a result of injuries varying from a punch on the jaw to a gunshot wound of the neck. The thrombosis may develop from a few hours to a few weeks after the injury (Caldwell 1936).

PATHOLOGICAL BASIS OF SYMPTOMS

Symptoms arising from thrombosis of the internal carotid artery contrast with those due to ligation of the artery. In the case of internal carotid ligation there is usually no disturbance at all, or there may be slight hemiparesis from which the patient often recovers with no further incident. In some patients, however, rapid and complete hemiplegia develops within a few minutes of the ligation of the artery. Thrombosis of the carotid artery, on the other hand, is characterised by repeated minor pareses or attacks of dysphasia during the early stages; these cannot be explained by thrombosis and recanalisation, because they are too transient. Accordingly it has been suggested (Andrell 1943) that the attacks are due to nervous impulses arising in the wall of the diseased carotid artery and causing vasospasm of the cerebral vessels. Treatment by removal of a portion of the internal carotid artery and by cervical sympathectomy is based upon this concept.

SYMPTOMS

The first symptom is often some transient weakness of one of the extremities, usually on the right side, associated sometimes with a minor disturbance of speech. Partial recovery usually takes place, and there ensue several recurrent exacerbations of weakness and disturbance of speech culminating in a dramatic incident with increased weakness, aphasia, loss of consciousness, or visual defect, leading the patient to come for treatment. Headache does not seem to be a prominent symptom. The interval between the initial episode and the major incident varies from a few hours to many years—e.g., case 1, $1^{1}/_{2}$ hours; case 6, 2 years; case 4, 6 years. It is suggested that slighter episodes are due to spasm of the smaller cerebral vessels consequent on nervous impulses originating in the diseased wall of the internal carotid artery, and the major episode is due to either complete or incomplete thrombosis of the main trunk. It is most interesting to note that in only one of our cases thrombosis had occurred on the right side, all the other lesions being on the side of the dominant hemisphere. This peculiar lateralisation of thrombosis has been noted in other cases reported. For instance, of the 23 cases collected by Andrell (1943) 16 were on the left side. This is in contrast to thrombosis of the smaller cerebral vessels, since Jones (1909) in 372 cases of cerebral thrombosis and softening found the lesion in 176 on the right and 196 on the left, an approximately equal incidence.

Hemiparesis varies from slight unsteadiness or inability to perform fine movements of the hand to complete hemiplegia, and dysphasia varies from a slight degree to complete aphasia. In one of the cases reported above the eye on the affected side was blind, owing to thrombosis of the central retinal artery.

In some cases there is definite improvement in the condition after a time, as in our case 1, which has been followed more than three years; the patient's speech has improved considerably, and though he is still hemiparetic he can walk about. In most of the reported cases the condition has remained stationary for years.

SIGNS

Central Nervous System

Most of the patients were rather euphoric. Hyposmia was noted in 1 case, and Egas Moniz (1947) has also mentioned anosmia as not uncommon. Papillœdema has occasionally been observed, but on the whole it has been rare. Homonymous hemianopia from cerebral thrombosis, or total blindness due to thrombosis of a central retinal artery, may be present. Facial weakness of upper-motor-neurone type is common. A few patients have complained of noises in the ear without any evidence of deafness. Hemiparesis, with sensory involvement of cortical type, may affect the face, arm, and leg in an unequal degree.

Cardiovascular System

One of the patients had no pulsation in the dorsalis pedis and posterior tibial arteries, as a result of a peripheral vascular lesion. Another had generalised arterial disease. None of the 6 had much hypertension, the highest blood-pressure recorded being 180/95.

Lumbar Puncture

The pressure of the C.S.F. was usually normal or subnormal, with normal biochemistry and cytology, except in case 1, where the C.S.F. was grossly bloodstained.

Pneumo-encephalography

This showed either a normal ventricular system or a slight enlargement of the ventricle on the side of the lesion, with large subarachnoid spaces.

Angiography

This is the most important diagnostic measure. It is safely and simply done, usually under local anæsthesia. Angiography of the common carotid artery is most suitable, because it will show absence of circulation or partial block of the internal carotid as well as increased size of the external carotid branches. The percutaneous technique (direct injection into the artery without exposing the vessel) is popular at present, but in case 4 direct exposure of the artery showed its pathological condition.

The commonest site of thrombosis in reported cases seems to be either the point of bifurcation of the common carotid artery or a centimetre or two above the bifurcation. Of our 6 patients 1 had complete thrombosis of the carotid artery, 2 had thrombosis just above the bifurcation, and 2 had a lesion of the intracranial portion of the internal carotid artery, shown by its straight course, the irregularity of the wall, and the narrowing of its lumen. Though the vessels appeared to come to an abrupt end, some radio-opaque substance had passed into the branches of the middle cerebral artery, suggesting incomplete thrombosis. Finally, in 1 case there was much tortuosity, narrowing, and irregularity of the lumen of the internal carotid artery in its intracranial portion. In all our cases (especially no. 5) the external carotid branches were dilated. This has also been noted by other workers.

Though cerebral vascular lesions were suspected in 2 cases, a diagnosis of carotid thrombosis could not have been confirmed without angiography. In 1 case careful
palpation of the common, internal, and temporal br
of the external carotid artery would have given
diagnosis, which was ultimately made on direct e
of the common carotid artery. In making a diagnosi
internal carotid thrombosis with the aid of angiogra
certain precautions are necessary. Occasionally,
performing angiography in patients with some o
intracranial lesion, one finds incomplete filling of
internal carotid artery, most commonly somewher
its intracranial course. This is usually due to fa
technique. In the present 6 cases repeated injec
were given, and, when there was no filling of the inte
carotid at all, the bifurcation of the common ca
artery was exposed to confirm the diagnosis, as in ca
Where it is suspected that the thrombosis is in the cer
rather than the intracranial portion of the artery
should take care to ensure that the X-ray plate incl
the region of the bifurcation of the common ca
artery. In case 6, where the left internal carotid
thrombosed, vertebral angiography was also done
showed that the left posterior cerebral artery was
larger than the right, probably in compensation.
case 4, with complete thrombosis of the common ca
artery on the left side, angiography was done o
opposite side and showed increased vascularity
filling of some of the vessels on the side of the lesio

TREATMENT

Treatment does not differ widely from that of
paresis in cerebral thrombosis, and conservative
ment is usual. Riechert (1938) removed a portion
artery to abolish abnormal impulses reaching its
cranial branches, but the results were not encoura
Wolfe (1948) states that periarterial sympathect
cervical ganglion sympathectomy, resection of
common carotid artery with the adjoining portion
external and internal carotid arteries, and excisi
the thrombosed part of the artery have all been tried.
use of heparin and dicoumarol are contra-indicat
cerebral vascular lesions because of the possibili
cerebral hæmorrhage.

SUMMARY

Six cases of thrombosis of the carotid artery in dif
degrees, from partial thrombosis in the intrac
portion of the internal carotid to complete thro
of the common carotid artery, are described. Æti
symptoms and signs, methods of investigation,
diagnosis are discussed.

Our grateful thanks are due to Professor Cloake, Dr. B
Prof. Brodie Hughes, and Mr. Small for permission to p
cases admitted under them, and to Dr. Black for perm
to publish the X rays as photographs.

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“ . . . The question of why people are different or
determines their individuality is of the greatest interest.
It can be answered in a few cases. And the answers m
very surprising. ‘John Smith is a *complete* fool be
he cannot oxidize phenylalanine’ discloses *a relation* be
mind and matter as surprising as transubstantiation,
good deal better established. On the ethical side it rai
problem of human rights in a rather sharp form.
hopeless idiot the right to life and care, though he
is not a rational being nor likely to become one? If s
a chimpanzee with considerably greater intelligence
rights; and if not why not?”—*Prof. J. B. S. Ha*
F.R.S., in preface to Prof. L. S. Penrose's *Biology of*
Defect. London, 1949.

SEASONAL VARIATIONS IN THYROTOXICOSIS

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ORDS of the date of admission to hospital and of te of onset of symptoms both suggest that thyrois begins more often in the spring or summer it other seasons (Rusznyak 1922, Oehme and 1930, Hirsch 1930, Iversen 1948, Jacobowitz

Evidence of this sort may be fallacious, for s are not necessarily admitted to hospital at a tage of their disease, and they may forget or miset their symptoms. Long-term treatment with i-thyroid drug provides an opportunity of obtainre satisfactory data, since the patients are under bservation for long periods and any increase in hyrotoxicosis is immediately obvious, since larger ire required to control the symptoms.

INVESTIGATION

rvations have been made on 122 patients with oxicosis (118 with diffuse goitre and 4 with nodular treated with methyl thiouracil. For the first veeks of treatment the patients were in hospital; ter they attended monthly as outpatients while treatment, or at longer intervals when no drug eded. The present data were obtained from the ent records. Progress has been assessed from nical findings and the changes in body-weight ilse-rate. When the patient is seen repeatedly same observers, these data are sufficiently accurate ictical purposes. Anti-thyroid drugs were first ere in 1943, but the records of the early period, xperience was being gained, have been discarded, ie present report refers only to outpatients ng between June, 1945, and June, 1949.

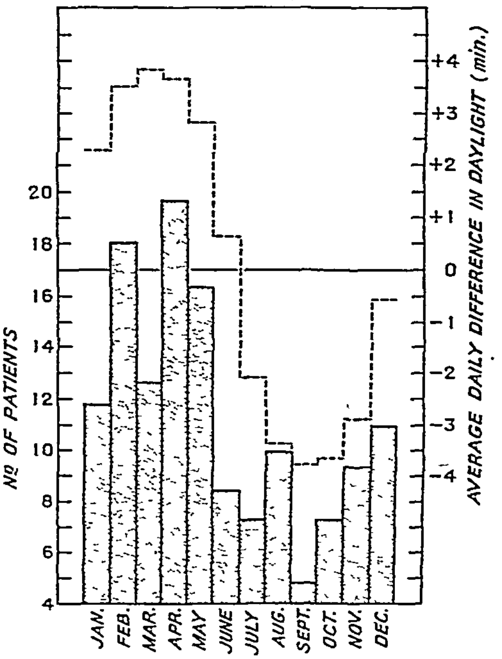
RESULTS

) of the 122 patients the dose of methyl thiouracil luced by gradual stages. These 59 patients showed lence of thyrotoxicosis while under treatment or nently, and it was therefore never necessary to e the dose. In these patients thyrotoxicosis parently become progressively less from the time ent was started, and if any seasonal variations were present they were obscured by the patients' uninterrupted progress towards recovery.

UTION BY MONTHS OF OCCASIONS ON WHICH AN INCREASE OF DOSE WAS NEEDED

nth	No. of patients needing increased dosage	No. of patients per 28-day month	Difference from mean monthly value
..	13	11·8	+0·5
..	18	18·0	+6·7
..	14	12·6	+1·3
..	21	19·6	+8·3
..	18	16·3	+5·0
..	9	8·4	−2·9
..	8	7·2	−4·1
..	11	9·9	−1·4
ber ..	5	4·7	−6·6
..	8	7·2	−4·1
ber ..	10	9·3	−2·0
ber ..	12	10·9	−0·4

In the other 63 patients unmistakable signs of thyrotoxicosis appeared at one time or another, either while they were still taking methyl thiouracil or after completion of a course of treatment. When this happened, the dose of methyl thiouracil was increased or a fresh course started. Usually the symptoms were soon controlled, and the dose was reduced again after a few months; in many cases exacerbations were only temporary events in an otherwise favourable progress. The accompanying table and figure show the number of these 63 patients needing an increase of dose in each calendar month during the four-year period. The figures have been corrected for varying lengths of month and are shown as the number which would have occurred in a 28-day month. In each of the first five months more patients needed an increase of dose than would be expected if the distribution were uniform throughout the year; in each of the last seven months fewer patients needed an increase of dose. David's (1947) test shows that, with a χ^2 of 20·6, this particular sequence would occur by chance much less often than 1 in 100 times.



Seasonal variation in daylight compared with number of patients on methyl thiouracil requiring increased dosage, arranged in months of the year: stippled columns, patients per 28-day month needing extra dosage; interrupted line, change in amount of daylight.

These data are derived from a particular type of patient —i.e., those who have had exacerbations of thyrotoxicosis during treatment. Analysis of the time of year at which patients have been able to dispense with treatment, without an immediate recurrence of their symptoms, suggests that most cases of thyrotoxicosis are in some way susceptible to seasonal influences. In the present series methyl thiouracil was discontinued whenever a patient had been symptom-free for three months on the lowest dose (25 mg. daily). At first sight it seems unlikely that this rather arbitrary procedure would have any constant relation to the time at which a remission actually occurred. However, when the times of stopping methyl thiouracil are plotted by calendar months, a surprisingly clear relationship to the seasons emerges. In over 60% of the cases the drug was discontinued in the four months October–January, both in those who had exacerbations and in those who made an uninterrupted recovery. This type of evidence is difficult to interpret and may not have much significance, but it is mentioned here because it leads us to suspect that seasonal variations in the intensity of thyrotoxicosis may not be confined to one particular class of patients.

DISCUSSION

The interrupted line in the figure shows the mean increase or decrease in the daily duration of daylight during each month, compared with the previous month. Since there is a good correlation ($r = 0{\cdot}83$, S.E. $= \pm 0{\cdot}30$) between the changes in the length of daylight and the numbers of exacerbations of thyrotoxicosis, it can be inferred that these are in some way connected. A reasonable assumption would be that length of daylight is one of the factors determining, directly or indirectly, the spontaneous variations in severity which have often been observed in thyrotoxic patients. But it would be a mistake to base any detailed argument on this correlation. It is highly probable that our data have a seasonal pattern; but the precise arrangement of that pattern might be partly accidental.

In normal persons basal metabolism tends to reach a peak during the spring (Brody 1945, Fitt 1941). This may well indicate a spring-time increase in thyroid activity. It is tempting to suggest that increasing length of daylight, which is known to stimulate the output of gonadotropic hormone by the anterior pituitary in several species of mammals and birds, can also stimulate the output of thyrotropic hormone. Man is certainly not altogether immune to seasonal influences; the growth-rate of children (judged by increase of weight) is greatest in the autumn and least in the spring; and even in the psychological sphere the spring-time peaks in suicide-rate and juvenile-delinquency rate suggest that changes in the length of daylight can indirectly affect emotional tone (Fitt 1941).

An alternative explanation may lie in the fact that some common foodstuffs contain a substance capable of inhibiting the production of thyroxine by the thyroid gland (Greer and Astwood 1948). The amount of this substance in the diet may vary at different seasons. It is known that cabbage picked in the early winter is more goitrogenic for the rabbit than cabbage picked at other times of the year (Webster et al. 1931). If other foodstuffs vary in a similar way, the net effect might be sufficient to control thyrotoxicosis in the autumn but not at other times of the year.

On the available evidence both of these suggestions appear about equally probable. Since our data are derived from a small number of cases, further confirmation of the facts is clearly needed; and it would be interesting to know whether similar seasonal variations occur in patients living in other latitudes and on other diets.

SUMMARY

In a group of patients treated with methyl thiouracil and under close observation throughout the year, exacerbations of thyrotoxicosis were found to be most frequent in the spring and least frequent in the autumn. This may be a direct effect of changes in the duration of daylight or an indirect effect of variations in the amount of goitrogenic substances in the diet.

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ELECTRIC-BLANKET TREATMENT RHEUMATOID ARTHRITIS

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IN the treatment of rheumatoid arthritis many a have been made to increase the blood-supply affected joints by various means, such as spinal pu transfusions of blood and plasma, intravenous injections, radiant heat, wax baths, and short diathermy. These methods are usually applied o short periods, and their beneficial effects are pondingly short-lived. What seemed to be re was a means of applying heat to the body which be well tolerated by the patient and would p sustained vasodilatation. The method adopted application of a large electric blanket to the low of the body.

The patient's feet, legs, and pelvis are well pr with sheets of cotton-wool bandaged to the lim body. The electric blanket is next wrapped rou lower half of the patient's body and kept in p with bandages. The blanket is left in position fo periods—4 weeks in some cases—and the patient taken out of it for toilet purposes. The temp between the cotton-wool and the skin is take charted every 4 hours and it is kept at 110 This type of application of heat produces gene vasodilatation with pronounced sweating. The re loss of fluid and salt is made good by additional The fluid intake and output of urine are charted a amount of chloride excreted in the urine is recorde

RESULTS

The patients tolerate this treatment well. Th hot and perspire profusely, but there are no constitutional disturbances. There is slight pyre temperature varying between 99° and 100°F, a pulse-rate is slightly increased. The patients however, a sense of general well-being, their app good, and they gain weight. They find the treatment very comforting and are definite abo loss of pain and improvement in the stiffness and i in the range of movement of the affected joints erythrocyte-sedimentation rate usually showed a fall of 5–10 mm. In no case was a rise observed. counts remained essentially unchanged, apart from improvement in anæmic patients; there was no cytosis as a result of the treatment. There w changes in the radiological appearance of the s bones before and after the treatment, but sof swellings were reduced. The patients were give diet and added vitamins—i.e., ascorbic acid and vit complex in tablet form—but no other treatm given while the patients are in the blanket.

In the last 18 months fourteen patients hav treated. Eleven of these had advanced rheu arthritis with severe joint deformities and much lim of movement, and three were moderately severe cas were in the blanket for 1 week, seven for 2 weeks for 3 weeks, and two for 4 weeks.

In every case there was striking improvement the first week of treatment; the range of moveme increased, the swellings subsided to a large exte the stiffness and pain were considerably relieved. women whose hands had been fixed for 5 year able to knit again after 3 weeks' treatment.

COMMENTS

Though improvement in these cases appears t been maintained, it is impossible to say at thi whether further relapses may occur; it is th suggested that the method should be tried at a centre on a larger series of patients who could be f fully. To me, the electric-blanket treatment o be more promising than any other measures t is now possible to apply in this country. An ial advantage is that it can be given in the s home under the supervision of his own doctor. ld be used in patients with early rheumatoid s and during relapses; the crippling effects of ase might then be prevented. For a moderately case, 2 weeks' treatment seems to give the m benefit.

electric-blanket treatment should also be tried entally in conjunction with other measures for ng the blood-supply to the diseased joints—e.g., sions of plasma and blood, nicotinic-acid infusions, ylammonium bromide, gold or vaccine therapy, ocopherol (vitamin E).

electric blanket is a clumsy device for applying ous heat, because it severely restricts leg move- Mr. D. Lang Stevenson, F.R.C.S.E., has suggested ousers covering the feet should be made out of blanket material. Such an appliance could sily be kept in position and would allow nursing n and movement of the legs. If it is to be applied nts in their homes the appliance must be absolutely roof and safeguarded against short-circuiting and . In view of the sweating it will produce, the ce itself should not be padded but should be over the protecting cotton-wool which can be l as required. One should also be able to regulate perature inside the blanket by means of a variable stat.

Q FEVER

REPORT OF A CASE

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VER was the name given by Derrick (1937) to le febrile illness occurring among slaughter-house s in Queensland, Australia. Burnet and Freeman showed that the organism recovered from these s was a rickettsia. The organism is known as *ia burneti.*

recently Q fever was considered to be of little nce except to certain communities in Australia. petros (1949) isolated a strain of *R. burneti* in 1944 an outbreak of an influenza-like illness in Athens, and in 1945 outbreaks of atypical pneumonia among roops in Greece and Italy were investigated by several and shown to be due to Q fever. The causal organism, ti, was isolated by Robbins et al. (1946). and Caughey dgeon (1947) presented serological evidence that an k of atypical pneumonia, previously reported by et al. (1946), was one of Q fever. Cheney and Geib identified the disease in Panama, and Topping et al. and Shepard (1947) reported outbreaks in the U.S.A. (1947) produced evidence of Q fever in Germany, and 948) described a small familial outbreak in Switzerland.

ew of the wide distribution of Q fever in the New World, Stoker (1949) looked for this disease at Britain and discovered Q-fever complement- antibodies in three patients who had had attacks pical pneumonia. Two of the patients had never verseas. These findings were regarded as evidence Q fever occurs in the British Isles. Harman (1949) scribed an outbreak of Q fever in a London hospital MacCallum et al. (1949) have isolated *R. burneti* the blood of one of the patients, thus proving sively that Q fever does occur in Great Britain. e following case-record describes an illness considered Q fever and probably contracted in the Bristol area.

CASE-RECORD

adio engineer, aged 22, was admitted on May 12, 1949, m Green Hospital, Bristol, as a case of primary atypical monia.

He had first felt unwell on May 2, 1949, when he was tired and unaccountably depressed. On May 5 he developed frontal headache, which gradually became severe. The headache occurred in bouts of moderate intensity and was most severe on sudden movement. On one occasion the patient stood up quickly and collapsed with sudden severe frontal pain. His appetite failed and he was very constipated.

On May 9 he consulted his doctor because these symptoms persisted and it was discovered that his temperature was 103°F. No cause for this pyrexia was discovered. On his doctor's advice the patient then went home to bed. During the night he suffered drenching sweats. On May 10 he developed a slight cough and noticed three small red spots on the skin of his abdomen. A sample of blood was sent to the laboratory for Widal testing. His temperature remained raised (103°F). On May 11 his cough became the predominant symptom. His sputum was blood-streaked and he complained of a dull ache over his right lower ribs anteriorly, made worse by deep breathing. His temperature was 100·4°F. On May 12 he had a frank hæmoptysis of bright-red blood. Since the illness had not responded to adequate dosage with 'Sulphamezathine' (30 g.), he was admitted to hospital for further investigation.

Past History.—Before the present illness he had always been healthy except for two attacks of pneumonia in childhood. He had been in the Royal Navy during the war but had not served overseas. He had had one injection of T.A.B vaccine in June, 1947.

Examination on Admission.—He was alert, intelligent, and of good physique. His general condition was good, and he was not unduly worried by the hæmoptysis. His temperature was 98·6°F, his pulse-rate 90, and respirations 20 per min. No skin lesions were noted. The tongue was covered with a white fur, but the fauces and tonsils were normal. The left tonsillar gland and axillary glands were palpably enlarged. On respiration there was diminished movement of the right lower ribs. The percussion note was diminished over the right lower zone. Over this area the respiratory murmur was bronchial in type and numerous "sticky" râles were heard. The spleen was easily felt during deep inspiration, the tip being two finger-breadths beneath the costal margin. The pulse was regular in rate and rhythm; the blood-pressure was 120/80 mm. Hg. The heart was not enlarged, and the heart sounds were pure and of good quality. No abnormality was found in the central nervous system. Auroscopic and ophthalmoscopic examinations were negative. Radiography of the chest revealed a clearing consolidation in the right mid-zone. The total leucocyte-count was 13,400 per c.mm. (polymorphs 73%, lymphocytes 20%, monocytes 6%, eosinophils 1%). The predominant organisms in the sputum were pneumococci; the tubercle bacillus was not found. Chemical and microscopical examination of the urine revealed no abnormality and culture was negative. The Widal reaction was suggestive of an anamnestic reaction, due to a previous T.A.B. inoculation. A test for cold agglutinins was negative.

Progress.—The patient, from the day of admission to hospital, felt well and did not need special treatment. His temperature, pulse, and respiration-rate remained normal throughout his stay. Hæmoptysis continued until May 15, and then stopped as suddenly as it had begun. The spleen could not be felt on May 16. By May 19 the physical signs of pneumonia in the right lower zone had disappeared, but the moist sounds previously noted in this area persisted. On May 23 radiography of the chest showed that there had been further clearance of the consolidation in the right mid-zone. The total leucocyte-count was 12,800 per c.mm. (polymorphs 73%, lymphocytes 23%, monocytes 2%, eosinophils 2%). On June 2 radiography of the chest showed no lesion. The physical signs in the right lower zone had disappeared, and the patient was discharged from hospital.

COMPLEMENT-FIXATION TESTS WITH Q-FEVER ANTIGENS

Dr. M. G. P. Stoker, of the department of pathology, University of Cambridge, examined samples of the patient's serum for Q fever. The technique described by Stoker (1949) was used for this investigation. The specimens of sera were obtained 26 and 39 days after the onset of the illness.

The titre of Q-fever complement-fixing antibodies was 1/80 in both specimens. Dr. Stoker considered this titre diagnostic of Q fever. Since the first specimen was obtained over three weeks after the onset of the illness, a rise in titre was not to be expected.

COMMENT

The patient's illness closely resembles Q fever in its sudden onset, high fever, severe persistent headache, lassitude, malaise, anorexia, and drenching sweats. Respiratory signs and symptoms in Q fever are usually described as minimal, and a pneumonitis is discovered on radiography in 60% of cases. The respiratory features vary. Hæmoptysis is described, though blood-streaking of the sputum is commoner. Many cases have been described in which the physical signs of pneumonic consolidation have been detected. Enlargement of the spleen has been reported in various outbreaks. In the present case the total leucocyte-count was higher than that usually reported, but this finding does not exclude the diagnosis.

Huebner et al. (1949), in a review of the clinical findings in 625 cases of Q fever, state that a high titre in the specific complement-fixation test, associated with a previous illness consistent with what is known about the disease, suggests Q fever. On these grounds the diagnosis was made in the present case.

An attempt is being made to trace the sou
infection in this case by serological investigation.

I wish to thank Dr. M. G. P. Stoker for the comp
fixation tests and for his help in the preparation o
report; and Dr. F. G. Jenkins for the clinical histor
patient before admission to hospital.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

The Tonsil and Adenoid Problem

AT a meeting of the section of laryngology on Dec. 2, with Mr. R. D. OWEN, the president, in the chair, the discussion was opened by Prof. R. S. ILLINGWORTH, who said that the *Index Medicus* recorded over a hundred entries under "Tonsils and Adenoids" every year. Writers on this subject must get away from "clinical impressions" and try to distinguish the results of careful surgery performed for the right indications from those of indiscriminate surgery inefficiently carried out.

The incidence of tonsillectomy varied in different areas of the world and in different social levels. In New York, of 1000 children who had been surveyed 61% had had their tonsils removed, and of the remainder all but 65 had been advised to undergo the operation. The more expensive the school, the greater was the chance that the pupils would be found to have had their tonsils excised. There were remarkably few reports on the correlation between bacteriological studies of the tonsil and the disease which tonsillectomy was intended to relieve. Comparisons were also lacking between the results of adequate therapy of such diseases as nephritis and cervical adenitis, and the results of tonsillectomy properly done and assisted by adequate therapy. Often tonsillectomy was worthless because the operation had been inefficiently done; the proportion of throats showing tonsillar remnants after operation ranged, according to different reports, from 42 to 77%. The tonsillar stump had a far higher bacterial content than the intact organ.

There was a great need for controls in assessing results. The peak incidence of tonsillectomy was in children aged 6–7 years. Yet it was at this very age that immunity against upper-respiratory infection was normally acquired. Many of the commonly accepted indications for the removal of tonsils and adenoids—such as frequent colds, growing pains, and cervical adenitis—were often signs of undiagnosed disease in other organs. For this reason, the results of eradicating the tonsils as sites of "focal sepsis" were disappointing. The reduced prevalence of tuberculous cervical adenitis was as likely to be the result of cleaner milk as of the increase in tonsillectomies. With accurate diagnosis and competent surgery, the results of tonsillectomy could be excellent; but these were swamped by the nu
unsatisfactory results of inaccurate and inefficient s

Physicians were often remiss about invit
laryngologist to examine the throat of the n
child at an early stage. They were too prone to c
in when all other therapeutic measures had bee
by which time the kidney had often suffered irre
damage. There was no reference in the literatur
employment, after tonsillectomy, of antibiotic a
histamine therapy as a shield to the diseased rena
Of 119 patients with nephritis who underwent t
tomy, 28 developed exacerbations as a result
operation. So far as could be seen, tonsillecto
little good in the treatment of nephritis, but t
were not reliable enough for reasoned judgment.

Complications after the operation were ma
various. Each year the Registrar-General r
about 85 deaths as a result of tonsillectomy.
American sources there was irrefutable eviden
during poliomyelitis epidemics tonsillectomy pre
the child to the bulbar form of this disease.
265 children with nephritis, 5% had developed the
immediately after tonsillectomy. Sinusitis an
were often found to date from this operation.

The false indications for tonsillectomy were:
appearance of the tonsil (it was not possible v
eye alone to decide which tonsils were disease
the size of the tonsil, which was of no significan
(3) the expression of "pus" from the tonsil,
again meant nothing. The operation should not
on patients under the age of 4 years; and
diseases were rarely benefited. The operation
never be done when there were no symptoms;
children referred for tonsillectomy, as many
had no symptoms in any way referable to the
The positive indications were: (1) frequent att
acute tonsillitis; (2) one or more peritonsillar ab
(3) for treatment of the faucial carrier of the di
bacillus; and (4) where the tonsils were so l
actually to block the fauces. Adenoids should be r
if they obstructed the mouth of the eustachian
The operation should be done during the spr

summer. The tonsils should be dissected ou
admission to hospital was essential. The child
be told and reassured about the operation, and th
of anæsthesia should be avoided by premed
Convalescence in healthy surroundings and a
follow-up were also necessary.

R. G. MACBETH outlined the history of the on, and indicated its rapid rise in popularity; as the year in which it was most often employed. a sensible hypothesis that the lymphoid tissue throat and nose acted as a defence mechanism, s machinery could be defeated and itself become e of infection. Overcrowding, defective hygiene home, and bad dietary were the common predis- causes of tonsillar infection. The surgeon's task decide whether a given pair of tonsils was harmful ficial. In this he got no help from the appearance of the tonsil. The parent, and above all the doctor, could give invaluable help in reaching a n. Welfare and school doctors were on the whole ble witnesses; they knew too little about the

s, he suggested, justifiable to remove the adenoids ave the tonsils when only the adenoids were to be diseased. The indications for adenoidectomy asal obstruction, snoring, purulent rhinorrhœa, quent attacks of otitis media, though commonly mptoms were the result of sinusitis. The tonsils be excised when: (1) there had been more than tacks of acute tonsillitis; (2) the patient had peritonsillar abscess; (3) persistently enlarged were present in the absence of nasal disease: tonsils were so large as to obstruct the faucial g; and (5) the jugulodigastric (tonsillar) lymph- were the site of tuberculous adenitis. There ed a mass of minor indications which it was t to describe in detail; the good family doctor provide invaluable help because of his prolonged ation of the debilitated and ailing child. Mr. h affirmed that the risk of a child developing poliomyelitis as a result of tonsillectomy must ghed against the benefit to be derived from the ion; tonsillectomy did not increase the liability omyelitis; but if poliomyelitis did occur it tended t the medullary centres if the patient had recently ubmitted to tonsillectomy.

real problem presented by "tonsils and adenoids" he disparity between the number of children ng operation and the number of beds available for For over two hundred years tonsillectomy had a beneficial operation if it was properly performed correct indications; and the number of children d for it was itself an advertisement of its tages.

R. SCOTT STEVENSON contended that the alleged nship between tonsillectomy and poliomyelitis was on transatlantic evidence which was so profuse self-contradictory that it could be made to prove verse, but Professor Illingworth, in reply, upheld w that the relationship was genuine.

. The general practitioner is in fact the principal t of social medicine in the field, and this is at once and the nightmare of general practice. There is al interest for the man who recognises that the real general practice lies in the promotion of health and prevention and cure of ill-health within the natural nment of family and community life. But there is nt frustration for the doctor whose training has moulded the view that the problems of disease must always be lered in isolation from the surroundings where they ed—for the surroundings will always intrude to thwart forts to recreate the artificial conditions of the hospital . . . In medical training it has sometimes been as h Mother Church, when sending a man to the mission in Darkest Africa, has trained him only in the finest of theology, while omitting altogether to discuss the le he would meet in his new parish, their beliefs and s, and their occasional primitive urge to eat missionaries." J. H. F. BROTHERSTON, *Universities Quart.*, August, p. 768.

Reviews of Books

Ankylosing Spondylitis

Part 1. F. HERNAMAN-JOHNSON, M.D., F.F.R., D.M.R.E., physician to the Charterhouse Rheumatism Clinic. Part 2. W. ALEXANDER LAW, O.B.E., M.D., F.R.C.S., assistant surgeon, orthopædic department. London Hospital. London: Butterworth. 1949. Pp. 200. 25*s*.

THE late Dr. Hernaman-Johnson practised first as a radiologist and later became physician to the Charterhouse Rheumatism Clinic. His ideas therefore lean towards radiology and radiotherapy, and his therapeutic approach is that associated with his clinic. He describes the spondylitic syndrome in detail, but offers no new ideas on the ætiology or pathology of ankylosing spondylitis. His chapter on diagnosis is good, and he emphasises the importance of adequate investigation of the young sufferer from backache. He differentiates ankylosing spondylitis from rheumatoid arthritis, but his chapter on differences between the two conditions is not very convincing, though the descriptions of the radiographic changes of spondylitis are good and are well illustrated. He describes treatment of the disease by radiotherapy, vaccines, chrysotherapy, bismuth, and thorium X, in that order, and adds a chapter on the general management of the patient. For the early stages of the disease he advocates wide-field X-ray therapy, though his technique has been almost entirely discarded by other workers. A brief chapter mentions the use of 'Cortisone' by Hench and his colleagues, and work on pregneninolone.

The second part of the book, by Mr. Law, is a well-illustrated and concise account of the surgical aspects of the condition. He discusses conservative surgical techniques, and gives a good description of spinal osteotomy and 'Vitallium'-mould arthroplasty.

Hearing and Deafness

A Guide for Laymen. Editor: HALLOWELL DAVIS, M.D., director of research. Central Institute for the Deaf, and research professor of otolaryngology, Washington University, St. Louis, Mo. London: Staples Press. 1949. Pp. 496. 21*s*.

THIS is a valuable guidebook for the person who has lost hearing in late life or is the parent of a congenitally deaf or hard-of-hearing child. The approach is both medical and psychological. No hearing-aid, Dr. Davis points out, can replace the loss of the ear's natural function; and it is only through training, and by adjusting his own emotional response, that a deafened person will find a hearing-aid of great benefit. Hard-of-hearing children should be fitted with individual hearing-aids as early as possible, because their speech development improves so much if they can hear enough to understand, or at least to keep their voices under good control. In the section on reablement Miss M. D. Pauls notes that lip-reading can be learnt by every deafened person, no matter what his age; indeed even people with normal hearing tend to lip-read unconsciously when their hearing is deadened by background noise. A hearing-aid never replaces the need to learn lip-reading, but it can help the learner with his lip-reading just as lip-reading helps with the use of the hearing-aid. The terrible frustration caused by loss of contact with the outside world can thus be overcome, or at least mitigated.

Most deaf-born children, says Dr. Raymond Carhart in his chapter on auditory training, have some residual hearing, as do those who, born normal, lose their hearing before they have learned to speak. He states emphatically that "if there is any suspicion that a baby is hard-of-hearing, his early years must be filled with loud and varied sounds," to stimulate whatever hearing he has. Hard-of-hearing children must learn what sounds are, and where they come from, and must be taught to understand the pattern of speech sounds. Then, even if they cannot hear all speech, they can at least learn to speak intelligibly and grow up to lead a normal life. He lays down rules for training based on the determination to "give the child full benefit of doubt." Dr. D. A. Ramsdell analyses the deep depression that sudden loss of the primitive function of hearing causes in adults—a depression that the deaf-born, for all their frustration, do not suffer, because they adjust themselves unconsciously to their condition.

Mrs. Tracy, in the foreword, puts the case of the deaf in a nutshell: "Granted that the first handicap of deafness lies in communication, it has often seemed to me that a close second might be the attitude of hearing people toward it and that the former would be considerably lessened if we could do something to improve the latter."

Gray's Anatomy, Descriptive and Applied

(30th ed.) Editors: T. B. JOHNSTON, O.B.E., M.D., professor emeritus of anatomy, University of London; J. WHILLIS, M.D., M.S., professor of anatomy, Guy's Hospital. London: Longmans Green. 1949. Pp. 1533. 84*s*.

THE new edition of "Gray" has a feature sufficiently rare among long-lived textbooks to excite comment: in spite of new material it contains fewer pages than its predecessor. This has been managed mainly by eliminating the section on surface anatomy and transferring its contents piecemeal to the appropriate places in the other sections. This is sound, since the surface anatomy of a given structure is nowadays more closely related to its topography, and no longer seems to the student an entirely separate subject—one which cannot be very important since it is tucked away at the end of the book. The type has been reset and many new figures replace worn-out plates; in some cases this process might have been carried further—for example, one figure of the diaphragm is indistinct and of little value. Two new X-ray photographs have been added, one of the lumbar vertebræ and one of a child's skull. In a book containing four films of the teeth and seven of the hand it is perhaps surprising that only one plain film of the chest should be included. The surface anatomy of the heart still conforms to the literally rigid inelastic pattern of the cadaver—with measurements in millimetres from the sternum. The beating heart is not yet an anatomical concept.

Lung Dust Lesions (Pneumoconiosis) versus Tuberculosis

LEWIS GREGORY COLE, M.D., F.A.C.R. New York: American Medical Films Inc. 1948. Pp. 478. $10.

THIS is a highly original publication by a physician who has held many radiological posts in his time, including that of professor of röntgenology at Cornell Medical College. It is not an orthodox textbook on the radiology of dust diseases and pulmonary tuberculosis, just as the author is not an orthodox radiologist. It is an attempt to apply a pathological yardstick to radiology by a pioneer who evidently enjoys the exploration of a difficult or a controversial subject, and who frankly confesses that if he has done nothing to change the accepted theories his hard work will have been wasted.

Dr. Cole graduated in 1898, five years after Röntgen discovered X rays, and has therefore seen the plant of chest radiology grow from its cotyledon stage upwards. One chapter of the book, indeed, is a reprint of an article published on the subject in 1910 in which he tells us he had made X-ray photographs of some hundred cases of early pulmonary tuberculosis as long ago as 1904–05. In due course this study led him to investigate silicosis and the pneumoconioses, and then to undertake the pathological check-up of their effects on which this book is based, and in which the petrological microscope and the study of the dust particles have played an important part. Fourteen years, he says, have been devoted to "simply recording what I have personally seen without reading the works of others"; and to summarise the results of such a very individualistic study is almost impossible. His attempt to study the dust particles within the framework of the fibrotic nodule which gradually surrounds them, with the aid of the petrological microscope, is a step in the right direction—we have made too little use of this instrument. He stresses the difference between the collagen of pneumoconiosis which tends steadily to increase, and reparative connective tissue formed elsewhere which contracts with age. He sees in this a difference in kind rather than of degree and would not include the collagen of the pneumoconioses among the connective tissues. His radiological-pathological classification is original, with a new terminology of vesicular, tuberculoid, cystic, and
usually accepted nodular, perivascular, and
varieties.

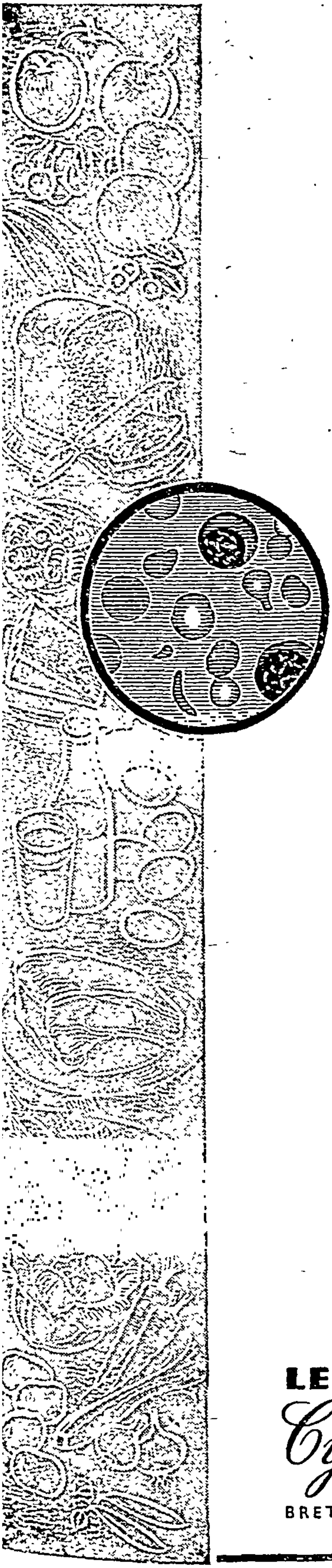
Altogether Dr. Cole intended to write—and
written—a most provocative book.

Green's Manual of Pathology (17th ed. Lon
Baillière, Tindall, and Cox. 1949. Pp. 1200. 4
Thanks to vigorous reducing the latest edition of this
book is only 34 pages longer than its predecessor—
an achievement in these days of expanding specialties.
H. W. C. Vines speaks in his preface of "a faint
spreading over the days of descriptive pathology," the
partly of chemotherapy, and partly of a changing
in medicine—from the study of end-pictures toward
study of the beginnings of disease. These factors
time change textbooks; but, as he says, the old orde
holds sway; and this book sets out well the princip
general and the details of systematic pathology
need to be understood by those practising clinical me

Fitness For Games (London: Heinemann
Books. 1949. Pp. 39. 2*s*. 6*d*.).—This simple manual by
Hornibrook is not intended as a guide to training for
distinction but for the benefit of young men who wish
games for their interest and enjoyment. That it is
by a layman is probably an advantage in that em
conclusions from experience are combined with
sense, and not obscured by unnecessary details of
and physiology. The book deals with the elementar
ciples of health; hygienic precautions are explained
first-aid treatment of injuries receives adequate att
Perhaps the author protests too much when he declar
post-exercise fatigue and exhaustion are due not
exertion but to the toxic effect of unhealthy teeth;
least this helps to emphasise the importance to he
regular dental surveillance.

A Primer of Electrocardiography (2nd ed. L
Henry Kimpton. 1949. Pp. 245. 22*s*. 6*d*.).—For those w
to understand electrocardiography, this American pr
Prof. G. E. Burch and Prof. Travis Winsor provides
a medium as is to be found in any textbook. At le
first quarter of the book explains the electrical processe
produce the several waves of the normal cardiogram.
later sections the abnormal patterns are similarly ex
The unipolar precordial leads are considered in a
section, but a precordial lead is not usually included
standard limb leads in the illustrations in the other
of the book. It is also perhaps a disadvantage that
cardiograms reproduced are not actual tracings but di
which, though very clear, do not carry quite the co
of the real thing. However, the ideal method pursued
out of interpreting the cardiogram on electrical princi
attract those with some knowledge of the subject.
unfortunately its mastery would absorb a dispropo
amount of the undergraduate's time.

Child Development (2nd ed. London: W. B. S
1949. Pp. 622. 20*s*.).—Today's parents are less co
that they are inherently qualified to deal with all
of upbringing than was Mr. Barrett of Wimpole
When they meet doctors or teachers socially the
them into corners, and there ask for guidance abo
child's stealing, or his failure to grow or read. This A
book, by Marian E. Breckenridge and E. Lee Vin
written for college students of psychology, teaching, m
and nursing. It covers the physical and emotiona
for good development, and the stages—physical, inte
and emotional—through which the child passes
carries a wealth of quotations from papers, and refer
reviews and original articles, European as well as A
and it is thus a long book to expect—for example—a
to read; but it is readable and the matter is wel
knowing. The authors' attitude is balanced and up
as is well illustrated by the discussion of adolescent s
Sometimes there seems a rather uncritical assumpti
results obtained on a group are universally applica
example the effect of giving additional vitamin B_1
The importance of self-consciousness in producing
kyphosis is not sufficiently emphasised; nor is
work on the relation of adolescent delinquency to the
tion of mother and young child. But these are
only of detail.



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THE LANCET

ONDON: SATURDAY, DEC. 10, 1949

ıfection in the Operating-theatre

NUS following surgical operations is rare in
practice, though among the 3000-odd cases
ıus collected by WAINWRIGHT[1] some 10%
stoperative. The source of infection in these
rative cases is usually difficult to prove.
has been most often incriminated, but
tly sterilised dressings, talc and sulphon-
owders, and the patient's skin and intestinal
ve all been suspected. The risk to parturient
from unsterile sanitary pads was emphasised
VERTAFT,[2] and some years ago there was a
eries of 5 fatal cases of tetanus ascribed to
of cervical packs to induce abortion.[3]

ıatural habitat of the tetanus bacillus is the
e; domestic animals (horse, cow, sheep, dog,
d rats have been shown to be carriers in varying
ion, but in this country the organism has
een found in human excreta. Tetanus spores
efore to be found in manured soil, street dust,
e like, which is why prophylactic tetanus
n is given routinely to accident cases. The
inated dust may be carried into a hospital
n into the operating-theatre by soiled shoes
ments; or it may be aspirated into the theatre
e outside air by natural ventilation. Moreover,
l ventilation is often so designed that it sucks
o the theatre from the surrounding wards and
s. Three years ago ROBINSON, McLEOD,
WNIE[4] described 2 cases of postoperative
in which there were good grounds for believ-
t the source of infection was contaminated
Bacteriological examination revealed toxi-
lostridium tetani in the dust of the operating-
in both hospitals, while soil in a field
ls from the windows of one of the theatres
und to be heavily contaminated. In an
ation of dust from 11 operating-theatres in
land hospitals, they found tetanus bacilli—
easy organism to isolate and identify—in
instance and that was from a theatre adjacent
f the two which had already yielded positive
The organism was found in the ground adjacent
of three hospitals where search was made.
issue (p. 1075) Dr. SEVITT describes another,
her unexpected, source of *Cl. tetani* and other
nic sporing organisms in a hospital operating-
—goat hair, which was being vigorously
before being incorporated in plaster by the
pairing a second operating-theatre nearby.
haust ventilating system probably helped to
nate the contaminated dust throughout the
suite, and the talc glove powder, regarded as the most likely vehicle for introducing tetanus spores into the wounds, was also apparently infected from the blown dust.

Surgical wounds are contaminated in the theatre probably more often than the surgeon believes, but such contamination is ordinarily not significant because the organisms are non-pathogenic, or, in small numbers, are readily destroyed by the tissues. However, serious complications may result from such contamination, as COWAN[5] has shown in neurosurgery; and DARYL HART[6] reported a high incidence of infected scars in chest surgery before he introduced an ultraviolet light barrier. With large raw-areas like burns the risk of airborne infection during the surgical toilet is much greater, and because of this BOURDILLON and COLEBROOK[7] devised a special dressing unit with an air lock and a forced ventilation plant which delivered filtered, warmed, and humified air from the ceiling so as to change the air 10–20 times per hour without discomfort to staff or patient. Such a plant is expensive to install and maintain, but is fully justified where large open wounds have to be dressed and perhaps in theatres intended for cranial and chest surgery. In many existing general surgical theatres the ventilation arrangements are highly unsatisfactory, and wherever possible a plenum system with an intake of filtered air at roof level should be installed in place of the exhaust type of ventilation which is calculated to draw dirty air and dust *into* the theatre. Hospital authorities who insist on clean milk and clean water should be equally particular about the cleanliness of the air in their operating-theatres and casualty dressing-rooms.

Milk

IN the production and distribution of the nation's milk, three important developments are discernible: first, administrative responsibility is being spread among a growing number of bodies, headed by the Ministries of Agriculture, Food, and Health; secondly, bovine tuberculosis is on the wane and a scheme for "area eradication" of tuberculosis is to be started next autumn; and thirdly, milk is to be made safer by gradually extending the areas in which pasteurisation is to become compulsory under the Milk (Special Designations) Act, 1949.

The administrative machinery has been reviewed by a joint committee of the British Medical Association and the National Veterinary Medical Association, whose report on the Provision of Safe Milk of High Quality appears this week. Besides the three Ministries—each with its inspectorate, local organisations, and area officers—the bodies concerned are the Milk Marketing Board, the county agricultural executive committees, the food and drugs authorities, the county and county-borough councils, and the local sanitary authorities. With the addition of tribunals, central and county advisory committees, and joint committees of producers and distributors, the number of organisations is likely to become still greater; and the committee asks itself whether this massive structure will be either economical or conducive to coördination. In particular, the diffusion among

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right, J. M. *Arch. Surg.* 1926, 12, 1062.
taft, R. J. V. *Brit. med. J.* 1937, i, 441.
W. L. *J. Amer. med. Ass.* 1941, 116, 2750.
son, D. T., McLeod, J. W., Downie, A. W. *Lancet*, 1946,
2.

[5] Cowan, S.T. *Ibid*, 1938, ii, 1052.
[6] Hart, D. *Arch. Surg.* 1938, 37, 521, 956.
[7] Bourdillon, R. B., Colebrook, L. *Lancet*, 1946, i, 561, 601.

the three Ministries of the responsibility for making regulations may "create a defensive system in Parliament which might well prove impenetrable." Broadly, the Minister of Agriculture now becomes responsible for all production problems, while the Minister of Food takes over many of the former functions of the Minister of Health; and the committee maintains that larger duties should be allotted to the Minister of Health and those answerable to him:

> "The authority responsible for the health of the community [should] be authorised and required to take regularly at the farm samples for biological tests. . . . Sampling and testing are skilled jobs and their efficient organisation may have a profound effect upon public health. The Committee takes the view that the whole of this work should be united and suggests that it should be allocated to local authorities at County and County Borough levels, operating through their medical Officers of Health actively coördinated by the Minister of Health."

In the second development—the reduction of bovine tuberculosis—this country lags far behind some others which have wholly eliminated the disease from their dairy herds. However, the position is improving, notably through the attested-herd scheme which was introduced in 1935.

> "In Great Britain, where in 1931 it was estimated that 40% of cows would react to tuberculin, and that 0·2% were affected with udder tuberculosis, the incidence has been greatly reduced. In 1945, it was calculated that from 30 to 35% of cows and 17 to 18% of cattle would react (England 20%, Wales 7·5%, Scotland 14%): at that time there were approximately 890,000 cattle in the tubercle-free herds . . . there are now some 1,704,000 cattle in such herds."[1]

Attested herds will be the basis for the scheme of area eradication of tuberculosis which the Minister of Agriculture[2] has undertaken to start next October. But eradication by this scheme will be a slow business; and the joint committee, while acknowledging that wholesale slaughter of tuberculin reactors is not feasible, urges that the test should be more widely used for survey purposes, and suggests that possibly reactors might be branded. Immediate eradication has been ruled out because the slaughter would cause a disastrous fall in the milk-supply and serious disturbance of farm economy: the cow plays an important part in maintaining soil fertility, and moreover a proportion of replacement stock must be bred from the tuberculin-positive. Yet ultimate eradication of tuberculosis will benefit the farmer hardly less than the milk-consumer. By one estimate,[3] the milking life of a cow in a tuberculous herd may be some three years, compared with five years for a cow in a non-tuberculous herd. If the milking life is longer, more heifers are available for replacement, making it possible either to produce more beef, increase the size of the herd, or, by selective breeding, develop a herd with greater milk-production.

Perhaps the best that can be hoped is that the area eradication scheme will have been completed within the next two decades. Meanwhile, the only raw milk which can be reasonably assumed to be consistently free from tubercle bacilli is that designated "tuberculin-tested."

> From Oct. 1, 1957, this designation is to be used for milk from an attested herd. The latest regul also recognise the special designation "acc though this is to be abolished on Oct. 1, 1954. supplied under this designation must conform to same bacterial requirements as does T.T. milk, but *designation does not imply routine tuberculin-testing* herd; and the joint committee holds that the desi should be abolished forthwith.
>
> The four designations[5] approved for milk that been heated are: "pasteurised," "sterilised," " culin-tested (pasteurised)" and "tuberculin- (sterilised)"; from Oct. 1, 1950, pasteurised milk be sold only in bottles or other containers, and Oct. 1, 1954, the bottles or other containers mu *filled at the pasteurising premises.* Milk tha "sterilised" becomes partly caramelised; and *committee urges that after this designation shoul* added "unsuitable for babies," and that the desi should be discarded as soon as possible.

Even now about 70% of milk sold for consum as a liquid has been given some form of heat t ment; but, mainly because of lack of machi it may be 5–10 years before all milk is pasteur Until that time comes a proportion of the p will run an avoidable risk of contracting, thr milk, not only the diseases of cattle but also diseases of those who care for them.

The Blood-vessels in Tuberculous Meningitis

THE clinician dealing with tuberculous menin today needs a sound knowledge of its underl pathology if he is to understand the prob presented by the disease before, during, and treatment. In this form of meningitis, as in acute purulent varieties, there is a tendency to t mainly in terms of the inflammatory involveme the pia-arachnoid and to forget that other structures are often implicated. TROUSSEAU[6] so impressed by the focal signs in life and the cere softening at autopsy that he suggested substitu the name "cerebro-meningitis" for "meningitis tuberculous cases. Localising signs in the ner system are common, with or without specific tr ment, and in the past they have too often b ascribed to hypothetical tuberculomas. At necro these have been hard to find, but in their place a of softening of the grey or white matter of on both cerebral hemispheres may be seen. We know that the softened areas are in fact inf produced by an occlusive arteritis of the basal ve of the brain as they course through the subarach exudate.

That the blood-vessels of the brain (both arte and veins) are involved in tuberculous meningitis long been recognised. The first account of the vasc lesions was given by BAUMGARTEN[7] in the latter of last century. He compared the changes in meningeal vessels in tuberculosis with the similar c occurring in the smaller arteries in syphilis. The n notable contribution, also in German, was ASKANAZY,[8] who described and classified the hi logical appearances in the vascular tunics of

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1. Ritchie, J. N. See *Brit. vet. J.* 1949, 105, 399.
2. *Lancet,* Nov. 19, p. 968.
3. See *Lancet,* July 16, p. 127.
4. Milk (Special Designations) (Raw Milk) Regulations, 1949.
5. Milk (Special Designations) (Pasteurised and Sterilised M Regulations, 1949.
6. Trousseau, A. Clinical Medicine. London: New Syd Society, 1867.
7. Baumgarten, P. *Arch. path. Anat.* 1881, 86, 179.
8. Askanazy, M. *Dtsch. Arch. klin. Med.* 1910, 99, 333.

s in tuberculous meningitis and commented e first time on the fibrinoid swelling of the ., a finding stressed by most subsequent writers. e time it was believed that the arteries were ed from within by the hæmatogenous spread of le bacilli,[9] but later histological evidence d convincingly that they were affected from tside in their passage through adjacent meningeal te.[10] More recently, Winkelman and Moore [11] merica gave an excellent description of the e pathological changes in the basal vessels of rain, and in this country Smith and Daniel,[12] pating the introduction of streptomycin and chemotherapeutic agents against tuberculosis, with the clinical and pathological aspects of l nervous system involvement. Smith and el emphasised the destructive changes in the geal and smaller penetrating vessels of the , which they felt were a sufficient basis for ftening commonly found. They rightly pointed hat if the treatment of tuberculous meningitis achieve recovery and not mere survival it must tarted before these vascular changes produce mic lesions and their accompanying crippling s. Their timely warning must be taken to if permanent sequelæ are to be avoided. latest study is that of Doniach,[13] who confirms ndings in the meningeal vessels in acute untreated rculous meningitis and contrasts the histological ges with those found in unsuccessfully treated ren under the age of 7 years who had survived eriods ranging from a few weeks to just over one Some of his cases had relapsed after completing urse of streptomycin. Scarring of the basal els with reduction or obliteration of their lumen the most striking change in cases which had surd for ten weeks or more. In treated cases dying in a month of onset the picture was essentially lar to that in the untreated controls. There was ing to suggest that the streptomycin introduced thecally was responsible for the vascular effects; could all be explained in terms of the prolongation fe. Indeed, similar changes have been recorded re in untreated cases where life had been prolonged ral weeks after the appearance of meningeal s.[11] In both the untreated and treated groups medial coat of an involved vessel seemed to play urely passive rôle, and, though sometimes harting a few migrating cells, usually preserved a nal appearance between the affected intima and entitia. Occasionally, all three coats and the en were involved in a caseous necrosis which ed part of a more extensive meningeal lesion. he relapse group scarred vessels imbedded in old ous exudate were associated with acutely inflamed els caught in fresh exudate.

xperience with the treatment of tuberculous ingitis has shown that cases presenting with focal s in the nervous system usually carry a bad gnosis, and that the relapse-rate in patients who ond to an initial course of treatment is high when there are residual neurological signs. The pathology of untreated and treated cases provides a rational basis for this clinical observation and also underlines the need for early diagnosis and early treatment. Our aim must be to give streptomycin before exudate and adhesions have formed in the subarachnoid space, and if we accept the work of Macgregor and Green [14] this is a comparatively late event. Once this basal exudate becomes extensive the normal flow of cerebrospinal fluid to the absorbing area at the vertex may be obstructed, causing hydrocephaly; the free circulation of streptomycin introduced into the subarachnoid pathways from below may be impeded, so that its access to all the sites of infection becomes difficult or impossible; various cranial nerves in relation to the base of the brain may be constricted and damaged, leading to blindness and permanent nerve palsies; and lastly, as we have seen, irreversible changes may be induced in the basal meningeal vessels coursing through the tuberculous exudate.

Annotations

WATER ! WATER !

The warning given last month by a working party of experienced water engineers [15] has received too little attention. They tell us that supply cannot meet demand. The population increases; agriculture and industry, working at high pressure, need quantities of water; housing schemes are pressed forward as fast as present conditions permit; new towns are springing up; greater domestic comfort and convenience are expected; villages cry out for piped supplies; indoor sanitation and proper sewerage must follow; progressive municipalities nowadays ask Parliament for powers to furnish hot water to householders—indeed, in the last few days the early stages of next year's local legislation have revealed that seven more local authorities are petitioning for this fashionable form of civic enterprise. All these phenomena may be matter for admiring congratulation, but they all demand more and more water. The water is not there.

In the ten years from 1938 consumption has gone up by 20% in England and Wales and by 10% in Scotland. Statistics indicate that, if the rate of increase continues, water undertakings will be faced in 1970 with a demand for twice the amount consumed in 1938. Water undertakers are several years behindhand in the normal expansion of their works. The war prevented capital expansion and deferred the tasks of maintenance; post-war shortages of labour and materials obstruct the making good of arrears. Water-supply is linked with sewage disposal. " Here again," say the engineers, " the foreseeable demands far exceed potential resources." They anticipate increasing competition from the new hospital and health services, and from local government needs, for the labour and materials allocated to the health departments of England and Scotland; and all these requirements " must be related to those of coal, gas, oil, transport, power and the export trades." Things may right themselves in time, but meanwhile there is something like a crisis in the short-term prospect.

Can anything be done? Well, at least, say the engineers, we can try to eliminate waste. Mr. G. M. McNaughton, chief engineer to the Ministry of Health, stated recently that, if a figure of eight gallons per head were taken as the daily waste, it represented approxi-

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Hektoen, L. *J. exp. Med.* 1896, 1, 112.
Rich, A. R., McCordock, H. A. *Bull. Johns Hopk. Hosp.* 1933, 52, 5.
Winkelman, N. W., Moore, M. T *Amer. Rev. Tuberc.* 1940, 42, 315
Smith, H. V., Daniel, P. *Tubercle*, 1947, 28, 64.
Doniach, I. *J. Path. Bact.* 1949, 61, 253.

[14] Macgregor, A. R., Green, C. A. *Ibid*, 1937, 45, 613.
[15] Interim report of the Comittee on Causes of Increase in Consumption of Water: Ministry of Health.

mately the whole supply to London or the supply to six towns the size of Manchester. The engineers' report devotes several pages to technical methods of detecting and preventing waste. As most of our urban systems are about a century old, plant must be looked to. Extremes of weather, traffic vibration, soil subsidence, air-raid concussion, and the use of the "booster" will have damaged mains and service pipes. In one recent instance a serious drop in the level of a reservoir was traced to a leak from which over 40,000 gallons had been escaping daily for a long period into an underground cavity. Undertakings are advised to review their system of inspection—is closer supervision wanted, is existing man-power properly used, ought more inspectors to be appointed, is their training adequate, are records of supply and consumption (including night flow) kept, can waste-water metering be adopted or extended, are all physical measures against corrosion, faulty fittings, and bad workmanship being applied, can water supplied for industrial use be recirculated? Above all, can consumers be induced to coöperate? Can they be made to realise that, before the finished product reaches the tap, expensive steps have to be taken to collect it, store it, treat it, and distribute it? The cottager who carries his supply in a bucket from a well is naturally more thrifty than the folk who have been brought up in a complacent world where a tap is turned on and water gushes forth abundantly. Some better propaganda is wanted than the mere repetition of injunctions not to waste water. During the next few years there will be a formidable menace to our improving standards of public health and personal hygiene. What are we doing about it?

THE CHRONIC WARDS REVIEWED

STUDIES of the aged sick in hospital are multiplying as our understanding of what can be done for these old people grows. Last week we published a review, by Dr. J. M. Greenwood, of 399 patients in the chronic wards of a general hospital in Manchester; and this week Dr. G. F. Adams gives an account of 310 patients treated in the chronic wards of the Belfast City Hospital between August, 1948, and July, 1949. A report on 701 patients in Bradford hospitals, by Mr. Peter McEwan and Dr. S. G. Laverty, has also appeared, and we reprint some of their conclusions. All three studies serve to drive home once more the lesson that a very large proportion of cases formerly thought to be hopeless can be expected to respond well to treatment. At Manchester 205 out of the 399 were adjudged likely to benefit. At Belfast 58 of the 310 patients were classed as "elderly infirm," 67 as remediable sick, 107 as irremediable sick, and 78 as psychiatric cases; but at the end of a year 14 who had been classed as irremediable and bedfast had advanced to the ranks of the elderly infirm—i.e., they were up, dressed, and walking for the best part of the day—and 10 more "irremediables" had benefited enough to go home or to be transferred to resident homes. Against this must be set the fact that 15 who were expected to respond to treatment had not done so. In all, however, 76 patients had responded. The Bradford survey is not concerned with treatment, but is a careful estimate of the physical state of the patients—"the final result of the hospital system of the past, which is now, it is to be hoped, nearly at an end." Even for these old people, decrepit in body and mind, much can be done; but the chief aim of the geriatric service, in McEwan and Laverty's opinion, must be to keep other old people from falling into a like state.

All the writers agree that this can only be done if enough resident homes are provided into which the hospitals can transfer reabled old people who are homeless, or whose homes are unsuitable for their return. Such homes will free hospital beds for those who need active treatment; and the old atmosphere of stagnation in chronic wards can be exchanged—as p have shown already—for a spirit of liveliness and Dr. Adams reminds us of Mr. L. Z. Cosin's f that among patients over sixty admitted to c wards, 40% may be expected to die within a year, 40% can be made fit enough to be discharged, and 20% will need continued care in a long-stay a By treating such old people actively Dr. Marjory W has been able to empty beds long filled, and to subs 200 beds with a turnover for 700 beds with stagnati

RETICULOCYTES AND LIVER ACTIVITY

WHEN a potent liver preparation is given by any to a patient with pernicious anæmia in relapse first striking change to be seen in the peripheral is an increase in reticulocytes; the proportion of ret cytes rises steadily for a few days to a peak and falls, though to a still elevated level. The ri fall takes about a fortnight, at the end of whic red-cell count and hæmoglobin level are found to be and this rise is sustained if further treatment is The "reticulocyte peak" was one of the earliest ob tions made when liver treatment for pernicious a was introduced, and it was noted that the pea centage of reticulocytes reached was roughly in proportional to the initial red-cell count—i.e., the the red-cell count before treatment the highe reticulocyte peak produced by a given dose of a liver preparation. It is not surprising therefor many attempts have been made to devise fo from which the height of the reticulocyte peak or t in red cells and hæmoglobin could be predicted fr initial red-cell and hæmoglobin levels. With a formula of this kind the actual results produced batch of liver extract could be compared with the ex results and the comparison used as an estimate potency of the batch.

This game of formula-devising has now gone some twenty years with indifferent success. No f has been generally accepted or has recommende to interested official bodies in this country. destructive criticism has been levelled at them, our last issue Dr. Kohári-Kuchárik quoted some disadvantages and proposed another remedy. Clark[1] collected a vast amount of information fr records of 228 pernicious-anæmia patients in the He found that less than half of the reticulocyte obtained reached the standards calculated ac to those used by the U.S. Pharmacopœia anti- preparations advisory board. And closer invest revealed three serious difficulties: (1) that the s of liver extract given to patients with very simila red-cell counts could produce widely differing r cyte peaks; (2) that there could be a good retic peak and yet a poor subsequent rise in red ce hæmoglobin; and (3) that there could be als reticulocytosis and yet the red cells and hæmo rose at maximum rate. Della Vida[2] sought to come these difficulties by eliminating the reticu count altogether from the calculations and his assay on the initial red-cell count and the rise in red cells during the first fortnight after ment; but his formula too does not overco disadvantages inherent in such methods.

These findings will surprise few workers wh had long experience in observing the effect o extracts on pernicious anæmia. In fact, ind variation of response can cause so much confusi the surprising thing is not that these formu criticised but that their results were ever co enough for them to be seriously considered. animal test, the variations could perhaps be mi

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1. Clark, G. W. *Amer. J. med. Sci.* 1918, 216, 71.
2. Della Vida, B. L. *Lancet*, 1942, ii, 275.

ng a large population and applying statistical ls; but the assessor of liver-extract potency y if he can find five suitable patients on whom to particular batch. So most assessors base their n on all the evidence they can get—the reticulo- eak; the subsequent rise in red cells and hæmo- and whether this rise can be maintained and ied up to normal figures; and the patient's l improvement. In this way a reliable *qualitative* n can be given on the activity of a particular xtract. *Quantitative assessment is another matter;* venty years of failure suggests that some yardstick than clinical response must be found before there a generally acceptable standard.

ASSESSMENT OF PHYSICAL FITNESS

small group of investigators studying the practical s of physical fitness in this country has expanded last few years, largely as a result of the war and idening interest in the workings of the intact n being. Along with this expansion there has been eral recrudescence of applied physiology. For the ime since 1930 the Medical Research Council has of applied physiology, about to begin work under lm; the R.A.F. Institute of Aviation Medicine n to be enlarged; and a year ago the *Journal of ed Physiology*—at present mainly American, but ied to meet an international need—began cation.

ysical fitness is an awkward thing to estimate. the assessment of nutrition, some sort of criterion plied, and criteria of normality, though familiar to linician and social scientist, are somewhat foreign e physiologist. Then, though it is certainly possible excessively nourished, can one be excessively fit? there is always the question with which the artist *unch* retorted when asked how he kept fit: "Fit hat?" The technical methods used in assessing s are simpler than those of classical animal experi- ation, but the interpretation of results is incom- bly more difficult. The investigator must be thing of a jack-of-all-trades—physiologist in tech- e, clinician in approach, and sportsman in sympathy. kes a brave man to survey, even with simple tests, physical fitness of an entire Dominion, but this is Professor Cullumbine has done in Ceylon, with ts reported in the opening article of this issue. tests used were comparatively recent versions of ld procedure. The subject stepped on and off a bench imes a minute for five minutes in the "moderate cise" test, 45 times a minute for as long as possible ae "endurance" test, and 30 times a minute for as as possible in the "exhaustion" test. The effects blood-pressure and heart-rate were used as fitness es. There were also speed and strength tests. A lot ork has already been done with these and similar s, and Cullumbine's admirable large-scale survey not contradict the more laboratory-sized results. known, for example, that the amount which the t-rate rises on standard exercise and the promptness which it returns to the resting level are related to sical training, psychological state, and physique. emost in demonstrating the effect of a physical- ning programme was Craig Taylor in the U.S.A., in the study of the psychological state Maxwell es[1] and his associates in this country. In neurosis en the mild neurosis that overtakes us all from time ime, and not only the more spectacular effort syn- me—physical fitness declines. Women, on average, less well than men in these tests, and men tending ards the female in body build do less well than larly trained men of more exclusively masculine earance. The physiological reasons for these differences seem to be complex and may not be the same for training as for psychological state and physiqué. Neurosis may act by affecting the sympathetic control of the muscular blood-vessels,[2] but there are many other possible mechanisms. We are almost completely in the dark here. Why, for example, do muscles hypertrophy on constant use, and why do they do so only to a limited extent? Are there actual changes in enzyme concentrations in the muscle cells, so that less lactic acid is produced on exercise in the trained subject? Is there a hormonal explanation of the sex differences in physique, for it is said that hormones can alter cell-enzyme concentrations? There is enough in the intricacies of the subject to keep both surveyor and laboratory worker happy for many years to come.

SOMATIC EXPRESSIONS OF PSYCHIC EVENTS

THE body has a very limited repertoire of responses to stimuli. The skin can sweat with fear, embarrassment, or enthusiasm; the pupils can dilate, the mouth go dry, the heart beat fast, and the intestines rumble with wind, either through terror or pleasurable excitement. Rage, happiness, or grief may bring tears to the eyes. Or again a single emotion may be offered a limited choice of responses: anxiety may tighten the sphincters or relax them, fear may tauten the muscles or leave them as limp as wet paper. It is the same with most organs: plain muscle can only contract or relax; glands and mucous membrane can secrete, vary the quality of their secretion, or go dry; voluntary muscle can become tense or flaccid; and these responses all express changes in the vegetative nervous system—the sympathetic or the parasympathetic as the case may be. Even when the stimulus takes the form of a disease the body has only a limited number of things it can do about it.

Considering what a small box of conjuring-tricks we have at our disposal, the general effects we produce are wonderfully varied. Dr. Harry Stalker, considering the psychosomatic diseases,[3] points out that even the simplest disease is the result of multiple or cumulative stresses which break down the powers of adaptation or compensation. Some of these will affect the tissues, some the patient's way of looking at things; and the changes in mind and body will have reciprocal effects on body and mind. Looked at in this way every disease is psychosomatic; but it is convenient, as he says, to have a defined concept of what we mean when we talk about the psychosomatic diseases; and he recalls the classification of Weiss and English[4]: group I, sick people who are not "out of their minds" and yet have no definite bodily disease to account for their symptoms (the so-called functional disorders); group II, patients whose symptoms depend partly on emotional factors, even though organic disease—possibly serious—is present; and group III, disorders generally held to be wholly within the realm of "physical disease" and which have to do with the vegetative nervous system. Stalker suggests that the term "psychosomatic diseases" should be reserved for those in the third group, and offers the following tentative list of them:

> The paroxysmal rhinorrhœas, bronchial asthma, gastric and duodenal ulcer, ulcerative colitis, essential hypertension, arterial degeneration (including coronary-artery disease arising before *the senile age-period), hyperthyroidism, migraine,* chronic arthritis, some skin diseases, enuresis, and primary dysmenorrhœa.

The bodily manifestations in these diseases, he suggests, correspond to the bodily changes associated with the aggressive emotions—raised blood-pressure, increased

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1. Jones, M. *J. ment. Sci.* 1948, 94, 392.
2. Tanner, J. M., Jones, M. *J. Neurol. Neurosurg. Psychiat.* 1948, 11, 61.
3. *J. ment. Sci.* 1949, 95, 355.
4. Weiss, E., English, O. S. Psychosomatic Medicine. Philadelphia. 1943.

respiration and voluntary-muscle tone, tense posture and expression, gastric hypersecretion, intestinal hypermotility, and perhaps diarrhœa. They are, in fact, manifestations of an active sympathetic system; and he contrasts them with the signs of parasympathetic activity—the low blood-pressure, relaxed muscles, and sunken eyes—found in depression and neurasthenia. He is careful to remind us that these too are positive responses, and not merely the result of reduced sympathetic activity: the parasympathetic system is as capable of overaction as the sympathetic. The bodily effects of fear and anxiety lie somewhere between the two groups and are seen in anxiety neurosis. If his classification is correct, or roughly correct (for he confesses it is too neat for nature), then those with psychosomatic disorders should present evidence of aggression, latent or manifest. And sure enough, it seems that in the case-histories of such diseases "anxiety, obsessionalism, and more or less latent aggression are almost constant findings."

What decides the choice of symptom? Stalker suggests a hereditary predisposition to react to stress in a specific way; but this is only to say: "The boy is asthmatic because that's the kind of boy he is." Stalker, however, is merely presenting a hypothesis about the uncharted land of psychosomatic diseases: he admits that "nearly all the laborious, careful, and detailed work of exploration has still to be done."

THE HEALTH OF WELSH STUDENTS

THE attitude of students to their university career varies considerably. A survey by Dr. R. A. N. Hitchens and Dr. Graham Grant[1] shows that a high proportion of students in the University of Wales are thought to make inadequate use of their leisure, whether in the playing-fields or in cultural pursuits. The aim of many of them is to get through their course as quickly as possible and begin to earn, so that they may cease to be a burden on their families, who are often poor. Others find sports too expensive, or have to spend too much time in travelling, or are too much afraid of failing in their examinations (and thus losing their ex-Service grants, or being called up) to spare time for recreation. Not all the constituent colleges have good facilities for sport; and some of the students are apathetic about leisure activities. "The idea seems to be widespread that single-minded attention to studies and the avoidance of leisure activities is the most efficient way of pursuing a university career." This implies a sad, and possibly narrowing, misuse of opportunity, and almost certainly has an unfavourable effect on health. The survey is the first of a series of annual reports to be made on Welsh students, and is based on the study of 1002, mostly newly entered, who agreed to be examined; they represent some 64% of the whole entry.

Any deviation from the normal (however slight) which might have an adverse effect (however slight) on the student's health was noted as a defect; and on this criterion defects averaged over 2 a head. Psychological disturbances were found to be few and mild. Among the student population of all years the incidence of tuberculosis —as gauged by mass radiography—was low (0·7%); but only 3240 out of 5095 agreed to be examined, the proportions ranging from 49% in the University College of Wales, Aberystwyth, to nearly 80% in the University College of South Wales and Monmouthshire and the College of the Domestic Arts, Cardiff. At two of the colleges the students were Mantoux-tested, and next year this is to be done in the other colleges as well. Dr. Hitchens and Dr. Grant suggest that recreational opportunities might be improved, and they hope to develop health education through small group discussions.

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[1] Student Welfare. Annual report to the council of the University of Wales, for the year 1948–49.

SURGICAL RISK

"The ultimate arbiter is the clinical sense bor
experience out of adversity, coupled with the pa
will to get well." Thus Dr. Frankis Evans epit
his view of surgical risk during a discussion
Hunterian Society last Monday. Dr. Evans d
that the first surgical risk was the surgeon, a
second the anæsthetist. Among the important de
ing influences he included the choice of operati
the time it took, the staff and equipment in the
(good lighting was of prime importance), the re
for resuscitation, postoperative nursing, the
atmosphere in the ward, the time of year, a
patient's mentality. In his remarks on an
Dr. Evans brought out the possible perils of thiop
There were, he said, those who always gave 1 g.
that was the content of each ampoule; someti
drug was injected too rapidly; and occasiona
patient with unrecognised circulatory failure
slowed circulation-time received more than his
measure because the drug did not take effect as
as usual. He warned, too, against admin
chloroform to obstetric cases for a second time
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Special Articles

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G. F. ADAMS
M.D. Belf., M.R.C.P.

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The development of interest in the medical care of the derly in Northern Ireland has followed the pioneer ork in England, and in 1946 some ex-Service registrars ied to sort out a large group of so-called chronic sick atients in one hospital. At that time they had no uthority to take any active steps to improve the situa- ion, and, on the whole, the doctors gained more from he interesting clinical work than did the astonishing nixture of patients they found. Since July last year the Hospitals Authority has become interested in geriatrics because they badly need more beds, and examples such as Dr. Marjory Warren's convincing substitution of 200 beds with a turnover for 700 beds with stagnation enables them to see a means of obtaining some of them.

BELFAST CITY HOSPITAL

In the summer of 1948 a start was made in the Belfast City Hospital. This was at one time the largest Poor-Law union infirmary in the United Kingdom, and it has been partly converted into a general hospital with 1800 beds, of which 500–600 are set aside for the chronic sick. In a remote and antiquated three-story brick building, euphemistically named the " convalescent buildings," are 350 of these beds, in six large wards, three in each of the well-separated wings of the block, and between these wings communication is possible only on the ground floor. There was a heterogeneous collection of 60 beds and cots in each ward, of which one corner is partitioned off as a ward kitchen with an old-fashioned range and a battered sink. There are no lifts, the stairs are narrow, the lighting is poor, and the windows contain many panes. Patients were kept in bed to avoid falls because staff was minimal (at times only one nurse and an orderly were available), and apathy was paramount. There are some redeeming features: the wards are wide, good annexes were added in the 1930's, there is central heating (but the plant was not working efficiently), and the top-floor wards had been repainted after the war. The few nurses deserve the greatest credit for the way in which they managed to look after their patients under the difficult conditions. Not only did they succeed in keeping them, with few exceptions, free from bedsores and clean (despite scarcity of bed linen and clothing), but the wards themselves were remarkably well kept though, in such an old building, dust and dirt accumulate rapidly unless constantly swept away.

A rapid survey was made of the building and its inhabitants, and a report based on the recommendations of the British Medical Association was made. Additional staff, including an almoner, a physiotherapist, and an occupational therapist, were asked for, and reconstruction and renovation of the whole block recommended as the only alternative to pulling it down and rebuilding. However, Lord Beveridge's dictum has been taken to heart: " It is dangerous to be in any way lavish to old age until adequate provision has been assured for all other vital needs, such as prevention of disease and the adequate nutrition of the young." Geriatrics is such a newcomer that maternity services, pædiatrics, tuberculosis, &c., already have well-established priority. The programme which, it was hoped, would be completed by the end of the first year still hangs fire, but we did achieve something. Dr. Warren kindly arranged to take two sisters and two staff nurses for a short course of training in her geriatric unit. This training experiment has stimulated great interest and, by giving the nurses an ideal to aim at, enables them to carry on despite the depressing conditions under which they must continue to work for an indefinite period. We are most fortunate in our almoner, Miss E. M. Sargaison, who has a genuine interest in geriatric social work and has made the arrangements for most of the discharged patients, enabling the number of beds in the overcrowded wards to be reduced and a turnover, however small, to be maintained.

The segregation and redistribution of the 310 patients was a time-consuming task, and a temporary arrangement was made whereby only transfers from the general wards were taken and no new patients were admitted. Results last winter justified this step, for we were able to substitute some sort of order for the chaos in our wards and at the same time prevent the general wards from silting up during the winter with elderly long-term sick. Irremediable patients from the younger age-groups were not admitted, because the responsibility for their rehabilitation and social welfare should rest with the general respiration and voluntary-muscle tone, tense posture and expression, gastric hypersecretion, intestinal hypermotility, and perhaps diarrhœa. They are, in fact, manifestations of an active sympathetic system; and he contrasts them with the signs of parasympathetic activity—the low blood-pressure, relaxed muscles, and sunken eyes—found in depression and neurasthenia. He is careful to remind us that these too are positive responses, and not merely the result of reduced sympathetic activity: the parasympathetic system is as capable of overaction as the sympathetic. The bodily effects of fear and anxiety lie somewhere between the two groups and are seen in anxiety neurosis. If his classification is correct, or roughly correct (for he confesses it is too neat for nature), then those with psychosomatic disorders should present evidence of aggression, latent or manifest. And sure enough, it seems that in the case-histories of such diseases "anxiety, obsessionalism, and more or less latent aggression are almost constant findings."

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* Based on an address given to the Society for the Medical Care of the Elderly on June 24, 1949.

[1] Alstead, S. *Lancet*, 1949, i, 171.

What decides the choice of symptom? Stalker suggests a hereditary predisposition to react to stress in a specific way; but this is only to say: "The boy is asthmatic because that's the kind of boy he is." Stalker, however, is merely presenting a hypothesis about the uncharted land of psychosomatic diseases: he admits that "nearly all the laborious, careful, and detailed work of exploration has still to be done."

THE HEALTH OF WELSH STUDENTS

THE attitude of students to their university career varies considerably. A survey by Dr. R. A. N. Hitchens and Dr. Graham Grant[1] shows that a high proportion of students in the University of Wales are thought to make inadequate use of their leisure, whether in the playing-fields or in cultural pursuits. The aim of many of them is to get through their course as quickly as possible and begin to earn, so that they may cease to be a burden on their families, who are often poor. Others find sports too expensive, or have to spend too much time in travelling, or are too much afraid of failing in their examinations (and thus losing their ex-Service grants, or being called up) to spare time for recreation. Not all the constituent colleges have good facilities for sport; and some of the students are apathetic about leisure activities. "The idea seems to be widespread that single-minded attention to studies and the avoidance of leisure activities is the most efficient way of pursuing a university career." This implies a sad, and possibly narrowing, misuse of opportunity, and almost certainly has an unfavourable effect on health. The survey is the first of a series of annual reports to be made on Welsh students, and is based on the study of 1002, mostly newly entered, who agreed to be examined; they represent some 64% of the whole entry.

Any deviation from the normal (however slight) which might have an adverse effect (however slight) on the student's health was noted as a defect; and on this criterion defects averaged over 2 a head. Psychological disturbances were found to be few and mild. Among the student population of all years the incidence of tuberculosis—as gauged by mass radiography—was low (0·7%); but only 3240 out of 5095 agreed to be examined, the proportions ranging from 49% in the University College of Wales, Aberystwyth, to nearly 80% in the University College of South Wales and Monmouthshire and the College of the Domestic Arts, Cardiff. At two of the colleges the students were Mantoux-tested, and next year this is to be done in the other colleges as well. Dr. Hitchens and Dr. Grant suggest that recreational opportunities might be improved, and they hope to develop health education through small group discussions.

SURGICAL RISK

"The ultimate arbiter is the clinical
experience out of adversity, coupled with the
will to get well." Thus Dr. Frankis Eva
his view of surgical risk during a discussi
Hunterian Society last Monday. Dr. Eva
that the first surgical risk was the surgeo
second the anæsthetist. Among the importa
ing influences he included the choice of op
the time it took, the staff and equipment in the
(good lighting was of prime importance), the
for resuscitation, postoperative nursing, the
atmosphere in the ward, the time of year,
patient's mentality. In his remarks on a
Dr. Evans brought out the possible perils of th
There were, he said, those who always gave 1 g
that was the content of each ampoule; som
drug was injected too rapidly; and occasi
patient with unrecognised circulatory fail
slowed circulation-time received more than t
measure because the drug did not take effect a
as usual. He warned, too, against adm
chloroform to obstetric cases for a second ti
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[1] Student Welfare. Annual report to the council of the University of Wales, for the year 1948–49.

Special Articles

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G. F. ADAMS

M.D. Belf., M.R.C.P.

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Alstead, S. *Lancet*, 1949, i, 171.

wards or the department concerned rather than with a geriatric unit. This winter we hope to start admitting new cases and to have an outpatient department or at least an organised follow-up clinic.

The recognised authorities on the medical care of the elderly all agreed that any geriatric scheme will collapse unless the hospital unit has access to sufficient resident homes and long-stay annexes. Lack of these is one of our greatest handicaps in Northern Ireland. The voluntary residential homes have long waiting-lists and naturally tend to pick out the most active and medically fit applicants at their periodic "elections." Long-stay annexes do not exist (except in the few workhouses that remain), and we have not so many large houses suitable for conversion as there are in England. We do succeed in sending a fair proportion of patients home, to voluntary resident homes, or to the welfare wards of the old workhouses when they are fit to go out, but the lack of long-stay annexes is the real difficulty. Last year we sent a considerable number of patients to an annexe in another hospital 35 miles from Belfast which was used as an evacuation centre during the war, but that outlet will shortly be closed when that hospital takes over those wards for its own use.

There is little hope of any immediate solution to these difficulties, but the newly formed welfare authority is working in liaison with the Hospitals Authority on the social problems of old age, and it is hoped that in the next few years sufficient homes will be established to relieve the pressure. The difficulty of disposing of our rehabilitated patients became obvious within a month or so of starting work in the City Hospital, and a suggestion was made to the Hospitals Authority that a modified survey, similar to the Rowntree report and Sheldon's Wolverhampton survey, would be of inestimable value in planning future developments from both medical and social aspects. Small independent inquiries have been made from time to time in recent years, but no coördinated information was available. The Hospitals Authority accepted the proposal, an advisory committee was appointed, and the survey began in May, 1949.

SOME PROBLEMS

Some of the problems in the wards have so far not been solved satisfactorily.

Owing to the great difficulty in finding long-stay accommodation there are many frail ambulant, bedfast, and incontinent-bedfast patients still in the wards. Following the attempt made two years ago to investigate these patients, one of the doctors tried the simple experiment of putting all the hopeless irremediable patients in one ward (60 bed [illegible] remediable and sick in another, and [illegible] in a third. The results in the first ward were disastrous, and both patients and nurses were intensely unhappy. That experiment has made me sceptical of the wisdom of giving any one group of nurses only one type of patient to look after; but, though we have distributed the burden of the irremediable patients (especially who are incontinent) among the six wards, we have solved the problem, because irremediable patients, e if grouped in special beds, inevitably distract attention from those requiring rehabilitation if nursed in the same ward. It might be best to give each sister two separate wards and enough nurses to run one as a rehabilitation ward and the other as hospital long-stay accommodation, changing the staff at intervals so that they have their fair share of each.

TABLE I—ANALYSIS OF DISCHARGES

Type of patient	Total no. in hospital in August, 1948	No. discharged to				No. died	No. remaining	No. readmitted
		Own home	Resident homes	Long-stay annexe	Mental hospital			
Elderly infirm	58	7	20	10	2	8	11	3
Remediable ..	67	14	6	5	..	7	35	3
Irremediable	107	6	4	6	4	29	58	..
Psychiatric ..	78	3	9	6	17	17	26	1
Total ..	310	30	39	27	23	61	130	7

We have not decided what to do with those patients one regards as "frail ambulant"—e.g., hypertensive failure requiring digitalis; diabetics requiring insulin; and recovered but frail hemiplegics. Should these remain under hospital care (long-stay annexe or otherwise) or should the welfare authority make provision for them?

There are always one or two patients who, though not certifiable, are a constant nuisance in the general wards. They may be rowdy, abusive, fond of "baiting" other patients, actively uncoöperative, or ready to make trouble at the slightest provocation or even without it. Often they have been turned out of their homes by relations who have had more than they can stand of their antisocial behaviour, and if they have an irremediable complaint and cannot leave hospital they present a very difficult problem in management.

I have not given any statistical details of incontinence in this series of patients, but our experience has been similar to that of other geriatric physicians. Most of those incontinent patients who were enabled, with treatment, to get up, if only to sit in a chair, became free from incontinence while up, but very many of these are still incontinent at night when they return to bed. This nocturnal incontinence still awaits a solution. Some of these cases may respond to Wilson's cystometric technique when we start this treatment. Urinary incontinence is three times more common among our female patients. Fæcal incontinence is relatively uncommon since we introduced periodic enemata each week in those complaining of this condition, with regular bed-pan rounds and careful supervision of the patients while they are in use.

TABLE II—RECLASSIFICATION OF CASES

Type of patient	No. in August, 1948	No. in June, 1949	No. transferred from			
			Elderly infirm group	Remediable group	Irremediable group	Psychiatric group
Elderly infirm	58	41	..	14	14	1
Remediable ..	67	9	1	..	1	..
Irremediable	107	72	..	15	..	13
Psychiatric ..	78	17	1	..	2	..

RESULTS

The statistics which follow show the results of the work in the convalescent buildings of the Belfast City Hospital from August, 1948, to July 31, 1949.

There were 310 patients in the wards—154 men and 156 women. The average age of the male patients was 71 and of the female 74; 27% of the men and 35% of the women were aged 80 or more; 50 men (32%), and 55 women (35%) were ambulant (implying various degrees of activity from ability to get up and help to carry food and do "chores," which applied to one or two patients in every ward, to being able only to walk out to the annexe when necessary). 19 men (12%) and 37 women (24%) were incontinent.

These patients were grouped according to the B.M.A. classification as follows:

Elderly infirm	Remediable sick	Irremediable sick	Psychiatric
58	67	107	78

BLE III—LENGTH OF STAY IN HOSPITAL OF PATIENTS DISCHARGED

ither harged	Length of stay in hospital							
	Less than 1 month	1–5 mos.	6–11 mos.	1–2 yr.	3–5 yr.	6–10 yr.	11–20 yr.	More than 20 yr.
.. ..	2	5	3	3	6	1	..	1
t home ..	2	8	2	4	1	3	..	3
ay annexe	..	1	1	2	2	2	..	..
tal ..	4	14	6	9	9	6	..	4

the following 12 months 180 patients left the , as follows:

	Resident home		*Long-stay annexe*		*Psychiatric (mental hospital)*	*Died*
	Welfare	*Voluntary*	*Frail ambulant*	*Bedfast*		
..	23 ..	16 ..	21 ..	6 ..	23 ..	61

ls of discharges from the different groups are given le I, from which it will be seen that 22% were rged either to their own homes or to resident , and 16% to long-stay annexes or to a mental al: 19% died; and 43% remained.

patients from the original series who remained in ards at the end of the year were reclassified, and II shows the figures for June, 1949, compared with for August, 1948, for the different groups, together the numbers of patients transferred from one to another. It is an interesting reflection on one's y to estimate the potential capacity of an "old r" in the chronic wards to see that 14 patients were considered to be "irremediable" bedfast in August, 1948, are now classified as "elderly ," which means that they have recovered suffi- y to be up, dressed, and walking about for the er part of the day. In addition to these patients ore so-called "irremediables" were discharged or to resident homes (see table I). On the other 15 patients originally considered to be "remedi- have not responded to treatment and are now ded as "irremediable." The 12 patients transferred the "psychiatric" group to the "irremediable" are not certifiable but have mild degrees of ent cerebral incompetence.

ABLE IV—ADMISSIONS AND DISCHARGES IN A YEAR

ted	No. discharged to						No. died
	Own home	Resident home	Long-stay annexe		Mental hospital	Elsewhere	
			Frail ambulant	Bedfast (voluntary)			
	119	24	6	2	15	5	83

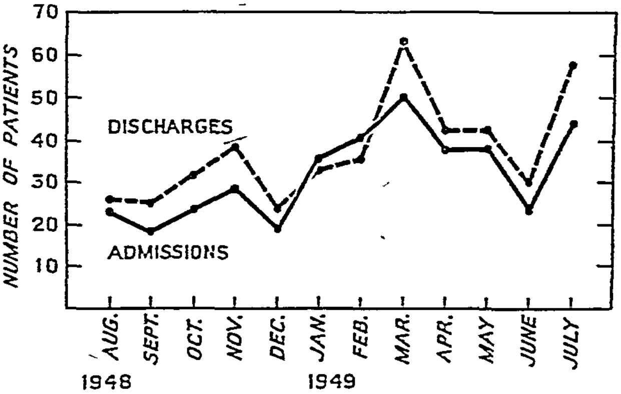
ecords in the early months were incomplete, and s accompanied some transfers to other institutions: e dates of admission have still to be traced for all original 310 patients. The length of stay in hospital 75 of the original patients was as follows:

Stay in hospital	*Men*	*Women*	*Total*
Less than 1 month	5 ..	5 ..	10
1–5 mos.	21 ..	20 ..	41
6–11 mos. ..	17 ..	18 ..	35
1–2 yr.	31 ..	40 ..	71
3–5 yr.	31 ..	37 ..	68
6–10 yr.	10 ..	17 ..	27
11–20 yr.	7 ..	4 ..	11
More than 20 yr. ..	6 ..	6 ..	12
Total ..	128	147	275

The length of stay in hospital of 52 of the original patients discharged home, to resident homes, or to a long-stay annexe for frail ambulant patients is shown in table III. These discharges are distributed over all the groups whose stay in hospital is given above, and not to most recent admissions alone. Four patients who had been in hospital for more than 20 years were fit for discharge home or to resident homes.

The accompanying figure shows the gradual rise in the rate of admissions and discharges to the wards over the twelve months. During the early months beds were being reduced in the wards to relieve overcrowding. The peak in March is explained partly by the fact that about that time a considerable number of patients went out who had required little more than encouragement and social readjustment to enable them to leave hospital, and partly by the good weather and the approaching spring, which invariably stimulates the old lodging-house inmate to bestir himself and leave his winter-quarters in hospital to spend the summer elsewhere.

Finally, table IV shows the results obtained with the new patients admitted in the past twelve months. It will be seen that out of 382 patients aged 60 or more admitted to the geriatric unit 40% were discharged home, to resident homes, or to long-stay annexes, 22% died, and 5% were discharged to a mental hospital or to other hospitals for some specific reason; 33% remain either under treatment still or in the long-stay wards of the geriatric unit: 3 patients were readmitted.



Admissions and discharges.

Experience in the pioneer geriatric units in England has shown that their figures for discharges home or to resident homes, and deaths among patients aged 60 or more admitted to their wards, correspond very closely—about 40% may be discharged, and 40% may die in a year, leaving about 20% as a "residuum" for whom the hospital will require beds in a long-stay annexe. Our death-rate of 22% is very much lower, but this may be explained by the fact that our admissions were selected from patients in the general wards of the hospital—either remediable cases or irremediable "long-stay" cases—and many elderly patients died in the general wards who would have been included in our figures had we been taking direct admissions. This also explains our greater "residuum" (33%) which is aggravated by the lack of long-stay accommodation for frail ambulant patients.

I wish to thank the Northern Ireland Hospitals Authority for permission to publish this paper. The work was made possible by the courtesy of Dr. J. C. Davison, and I am indebted to the doctors and nurses of the "convalescent buildings" for all they have done to achieve these results and start a geriatric unit; to Miss E. M. Sargaison for her help with the tables; and to Dr. Marjory Warren for much helpful advice and encouragement.

CHRONIC SICK AND ELDERLY IN HOSPITAL *

CONCLUSIONS FROM A BRADFORD SURVEY

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NEARLY all the 701 patients examined and classified in our survey are the final result of the hospital system of the past, which is now, we hope, nearly at an end. They are decrepit in mind and body. Their mental activities have decayed and they are dull, listless, and apathetic. Their joints are often stiff and painful, and their muscles weak. Everyone, themselves included, has regarded them as hopeless and useless, and that is just what they have become. This group has furnished us with many useful lessons of what not to do. Even for these patients, as they are today, much can be done. The old atmosphere of gloom and apathy can be changed and their outlook made brighter and happier, and many can enjoy getting about again, though the cure ratio must be small. The chief aim of a geriatric service in the future must be to keep the elderly from falling into this hopeless state.

A second group, near neighbours to the first, consists of the ambulant elderly in the public-assistance institutions. These act as feeders to, and are to some extent interchangeable with, the bedridden chronic sick. The ambulant group is under the care of the local health authorities. It is important that their medical attendant should in future work in close liaison with the medical officers of the geriatric hospital.

These two groups constitute a very small proportion of the elderly people of the nation, the vast majority of whom live at home. In Wolverhampton, for instance, Sheldon[1] found that only 2% of the elderly were in institutions, and 98% lived at home. There are three main reasons why the latter have not so far flooded these beds. First, there are no spare beds; they are crowded out. Second, the hospitals are not popular owing to the low standard of efficiency. Third, there is still a strong family bond of affection, and many relatives like to care for their old people and the old people cling to home. At the same time, some of the aged are a heavy burden; in Sheldon's survey $2^1/_2$% were bedridden and a further $8^1/_2$% were unable to stir outside the home. Many of these patients ought to be cared for in institutions or hospitals in simple justice to their heavily burdened relatives.

There is, however, a real and serious danger that if enough hospital beds were available and the medical services of good quality, admission would be claimed for a very large number of the elderly. So many of them suffer from disabilities, major or minor, against which they struggle bravely, that a great waiting-list for the hospitals could easily and legitimately be formed. This would be a calamity from every point of view. Home is the proper place for the aged. It is there that their roots are deeply implanted; their interests, their relatives, and their friends are there. They know every step of the house and can walk about with safety. They can be useful in many ways; indeed the grandmother can rear a second family and set free the intermediate generation. They have a sense of independence. If they are uprooted and go to hospital, all these assets vanish and often, as is well known, a rapid decline, physical and mental, takes place.

Further, it is of great importance not to family bond. Once the family link is broken, it difficult to restore. Sheldon lays great stress family affection and devotion; but however may have been of Wolverhampton in 1946–47, investigation gave clear proof that in Bradford in many old people are not wanted at home, and confirmed by family doctors. The reasons are many varied. One potent reason is the shortage of accommodation and consequent overcrowding; " age and youth " cannot live so close together times one is tempted to say " age and crabbed y The care of the aged may be a heavy task: the of making them comfortable may upset the budget, and curtail beer, tobacco, and the Occasionally, old people are not liked at home their " bad habits " are disagreeable and so detrimental to the children. In Bradford, the ment of female labour in the textile industry difficult to look after either old people or babie home. In addition, there is the Spirit of the Age, individualism and tending to throw all burdens State, thereby weakening the sense of family bility, unity, and cohesion. If once it were to fashionable to transfer the care of the elderly f family to the State without loss of face and w guilty conscience, a very big hospital and socio e problem would confront the community.

SUGGESTIONS FOR A GERIATRIC SERVICE

Can a geriatric service be devised which wi the elderly to spend their latter days in health a and happiness at home? There are two ways it could give valuable aid.

First, the geriatric service can, by an outpatien physiotherapeutic) department, enable many people to maintain a good enough state of healt mobility to avoid the need for coming into Painful feet, occurring in 38% of the elderly, and joints, are common disabling conditions, ca being greatly relieved. Efficient transport will be and an outpatient department free from draugh chills, falls, and fatigue, especially in winter, m than undo any benefit received.

Second, the geriatric service can deal, di indirectly, with socio-economic difficulties in the such as finance, shopping, queueing, laundry, in the house. For people living alone without help, meals by mobile canteen may be transp the home. Here an almoner service is of great va for patients and for old people with purely difficulties. Almoners could probably be reinfo voluntary helpers. The almoner should have sphere both within and without the hospital. Sh for example, imbue the relatives and patient outset with the idea that the hospital is only a te residence and that the patient as soon as fit will home. The doctor and the almoner should be touch because the medical and socio-economic are closely interlinked: often they should see the together so as to survey the whole picture.

Much care should be taken in the selection of There will be a group which should be admitted delay, including:

Patients in terminal conditions whose relatives a to look after them at home.

Senile mental confusion states which require adm prevent the ignominy of mental certification at an age.

Patients whose home-nursing is a real hardship to particularly where there is heavy incontinence.

Patients who would be alone at night if left at h

Sick patients who will benefit from hospital treat cannot be satisfactorily treated at home or as out even with the aid of transport.

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* Abridged from the concluding section of a report to the Bradford (B) hospital management committee. Copies of the report (5s.) may be had from the secretary of the Committee, Midland Buildings, 12, Canal Road, Bradford.

1. Sheldon, J. H. Social Medicine of Old Age. London, 1948.

these exceptions, most patients should be seen by riatric doctor either in the outpatient department, ng with the family doctor at home, so as to decide er treatment at home or as an outpatient will be iate. The hospital waiting-list should be carefully igated with the object of keeping out all patients do not need, or no longer need, admission. The of a geriatric hospital is thus intimately linked up the responsibilities of the local authorities, and a a should be arranged so that they work hand in hand.

A GERIATRIC HOSPITAL

s us now turn to the principles which should be ved in setting up a geriatric hospital.

e service centres on the efficiency and devotion of ief medical officer. It does not much matter whether a physician or surgeon or orthopædic surgeon or other qualifications. He must, however, be fully inted with the possibilities of modern treatment e elderly, the good results now obtainable, and the ods employed. He must be prepared to give idual care, or see that it is given, to each patient. a medical officer will inspire confidence and obtain siastic coöperation. He will win all concerned to ng for the work—sisters, nurses, orderlies, physio-pists, occupational therapists, almoners, and last not least the patients themselves and their relatives. od geriatric hospital is a happy place.

eatment should begin early in the course of a disease, in inpatient and outpatient departments, and nts should not be neglected after treatment ceases, ant of a follow-up. Relapses should be treated early. ring their stay in hospital patients should, if ble, remain in the same ward under the same sisters nurses, and they should certainly remain under the doctor. This ensures continuity of treatment, and ases the doctor's sense of responsibility; his interest res confidence in the patient and avoids the unneces- and wasteful labour entailed if a fresh medical officer o investigate and understand the case anew.

e chief medical officer should have available to him ervices of consultants and X-ray and pathological ties. It is desirable to have together under one roof least connected by covered way the following parts e hospital:

gistration and record room, doctor's room and examina-rooms, X-ray rooms, pathological rooms, physiothera-c unit, occupational therapy department, almoners' mmodation, waiting-room for patients and friends, en, typists' room, accommodation for coats and hats, accommodation, possibly an injection and dressing dispensary.

block should have a non-slippery floor, be well ed and ventilated, be free from draughts, and have on the walls to help the elderly in walking.

he question of grouping together patients suffering the same disease was considered. It appears better te treatment wards to arrange them according to ect of ultimate recovery, with a favourable ward a ward for less favourable cases. Separate wards required for the mentally confused and for the tinent, and patients who are bad influences in a d and those of dirty habits should be segregated. Some mmodation should be reserved for those about to die. atients should not be discharged home without first ing through a ward in which they can spend an active od to better-fit them for home life.

ards should be bright and airy, with flowers and eful decorations, and there should be diversions such music, concerts, or films. Occupational therapy fills ace. If tasks are useful and earn a reward, this is an ellent incentive. A day room and recreation room desirable.

he usefulness of a hospital depends partly on its turn-r. Patients pass more slowly through a geriatric than through an acute hospital, but they must pass through. About a third die in three months from admission, a third go home, and the remaining third must not be allowed increasingly to block the hospital; they must gradually pass on to hostels if well enough or to long-stay annexes or less active hospitals. Nurses should interchange to some extent. This will keep up the standard of the less active hospitals for the elderly. It will be good for nurses in training in acute hospitals to have some experience of geriatric nursing.

GERIATRICS AS A SPECIALTY

Thomson [2] stresses the necessity of bringing the aged chronic sick into the main stream of medicine, admitting them to the general hospital wards for accurate diagnosis and thorough treatment. He does not believe that geriatrics should be made a specialty, but considers that the treatment of these patients should fall to the general physician. While conceding that many aged patients will continue to need general hospital accommodation we are in favour of a specialised geriatric service, for many reasons.

The existing clinics where geriatric patients are successfully treated are in the charge of doctors who have developed a special interest in the work and who are in fact geriatric specialists. The long-term illness from which most of these patients are suffering requires the intensive and persistent application of medical treatment and nursing care. This is more likely to be given in a centre devoted to geriatric problems. The work appeals only to certain physicians and surgeons. In a general hospital ward geriatric cases may be easily relegated to an inferior status as of less interest than acute cases, and slower in their response to treatment.

Again, the number of potential patients who can be given treatment, and who can be prevented from entering hospital, by an efficient geriatric outpatient service is large enough to justify the geriatric specialty. We also hold that continuity of treatment is essential in these cases and can best be obtained by a special service whose medical officers supervise treatment and assess progress over long periods.

The pendulum at the moment has begun to swing strongly in favour of better treatment, medical and socio-economic, for the increasing number of elderly people of the nation. It has not yet swung nearly far enough, but care must be taken, if the total amount of hospital accommodation is limited, not to deprive the younger, active, working, and therefore more valuable individuals of the facilities for speedy restoration to work, by transferring too many old people permanently to hospitals, institutions, and hostels. This complex problem, many aspects of which have been discussed in our report, will ultimately reach a state of equilibrium which will give as full expression to the national instinct of human kindness as economic conditions will permit.

RESOLUTIONS ON REMUNERATION

AT a meeting on Dec. 1, the General Medical Services Committee considered the Minister of Health's refusal [3] to increase the amount of the central pool for the remuneration of general practitioners. The committee passed the following resolutions:

1. That in the view of the committee the reply of the Ministry of Health dated Nov. 14 to the request of the conference of the local medical committees for a recalculation of the central pool in the light of the facts now available is entirely unsatisfactory, and that an interview be sought to demonstrate its inaccuracies, to calculate the sum by which the central pool is short, and to reiterate the demand for an adjustment of the central pool to meet this deficiency.

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[2] Thomson, A. P. *Brit. med. J.* July 30, p. 243.
[3] See *Lancet*, Nov. 26, p. 1005.

2. That before the January meeting of the General Medical Services Committee an assurance be sought of the Ministry of Health that the central pool will be continuously adjusted so as to maintain in the future—whatever the changes necessitated by the heavy burden of work falling on general practitioners and whatever the increase in the number of doctors—the levels of remuneration recommended in the Spens Report which were accepted by the Government.

WELLCOME HISTORICAL MEDICAL LIBRARY

THE reopening of this library was celebrated on Dec. 2 at a luncheon attended by librarians and bibliophil doctors. Presiding as chairman of the Wellcome Foundation, Mr. H. Sier welcomed the guests, who returned thanks through Sir Arthur MacNalty and Sir Henry Thomas. Dr. E. Ashworth Underwood, director of the Wellcome Historical Medical Museum and Library, gave an account of the library and its origin.

It was founded by the late Sir Henry Wellcome to provide a comprehensive collection for students of the history of medicine and the allied sciences, and has been built up over the past fifty years by purchase at public and private sales, supplemented by gifts and bequests. It now contains about 200,000 printed books, pamphlets, and journals; 5000 manuscripts; and 100,000 autograph letters of medical and scientific interest, as well as other documents. Almost all the landmarks in the history of medicine are represented by original texts.

Of *books printed before 1500* (incunabula) it possesses 612 complete works and 22 fragments. This is one of the largest collections of medical incunabula in the world, its nucleus being formed of accessions from three famous private libraries,—those of William Morris, Dr. J. F. Payne, and Kurt Wolff—together with a smaller number from that of Prince Dietrichstein. A detailed catalogue will soon be in the press.

The *sixteenth-century books* number over 4000, with 700 English books printed before 1640, some of which are not to be found elsewhere outside the British Museum.

The library contains more than 10,000 books printed in the *seventeenth century*. From this century onwards all important advances in medicine and science are signalled by original texts. There is also a wealth of less well-known clinical and scientific material, including a wide range of early periodicals, which awaits the notice and study of the historian.

The library is very rich in *special collections*. In addition, there is a very comprehensive collection of modern *bibliographical and reference works*, so that only rarely need a reader look elsewhere for information on any topic. Current periodicals and new books dealing with the historical aspects of medicine and the sciences are acquired as they appear.

The *autograph letters*, which number more than 100,000, are still largely unexplored. The library also has a large collection of *Oriental manuscripts* and many modern printed works in the Oriental languages.

The task of cataloguing and arranging so vast a collection has hitherto occupied the full energies of the staff, and post-war conditions have made equipment and furnishing very difficult. But some temporary expedients have been adopted which will now enable the library to fulfil its function as a centre of medical and historical research. It is open at the Wellcome Research Institution, 183, Euston Road, London, N.W.1, from 10 A.M. to 5 P.M., from Monday to Friday throughout the year, except bank holidays. No books can be lent, but prints, lantern slides, and photostats can be supplied, and there is also a microfilm service with a reading machine. A general catalogue in short-title form is now being prepared for the press.

Historical and bibliographical inquiries can be dealt with by the staff: they should preferably be made by letter, but in exceptional circumstances requests for information by telephone will be accepted. Exhibitions will be held from time to time, and conducted visits for special parties can be arranged with the director or the librarian, Mr. W. J. Bishop.

THE ROYAL FACULTY CELEBRATES

FROM A CORRESPONDENT

DOCTORS are alleged to be excessively jealous of traditions and privileges, and in northern latitud be a bonny fighter is a coveted title. In the celeb of the 350th anniversary of the Royal Faculty of Ph cians and Surgeons of Glasgow, it was obvious the temper of the fellows is militant as well as jub There were frequent reminders of past relatio between the Faculty on the one hand, and the Cl the University, contemporary professional institu and the city fathers on the other. The Faculty day has crossed swords with most of these bodies northern kingdom, and has displayed the qualit resourcefulness and doggedness which spring fr realisation that the privileges of the Faculty are in able from responsibilities. This was the centra which guided the Faculty during its long peri professional jurisdiction over an area of Scotland a identical with that now entrusted to the W Regional Board, and its influence in the 17th and century was far-reaching, as described in these co on Nov. 26.

SERMON

The Minister of Glasgow (the Rev. Nevil Davidson preached the sermon at the cathedral service of comm tion, reminded the fellows that the Church had pr the pioneers who tended those sick in body or in Basing his observations on the text: "I am come tha might have life, and that they might have it more abund he emphasised that the Church today is still deeply con with physical as well as with spiritual health. Dr. Da also urged the president and fellows to consider whe might not be possible to achieve a greater measure of boration between the minister of religion and the m practitioner, suggesting that the means of achievin liasion might be examined at a joint conference of th professions. The service was concluded in the churc where the president, Dr. W. R. Snodgrass, placed a on the tomb of Dr. Peter Lowe while a snell wind merry with gowns and hoods.

HONORARY FELLOWSHIPS

In the Faculty hall on Nov. 28, honorary fellowship conferred on Emeritus Prof. E. P. Cathcart, F.R.S., Em Prof. G. B. Fleming, Sir Hector Hetherington, Prof. H Lloyd, F.R.C.O.G., Lord Moran, P.R.C.P., Dr. R. Barclay Dr. W. D. D. Small, F.R.C.P.E., Sir Cecil Wakeley, P. Mr. W. Quarry Wood, F.R.C.S.E. The ceremony took pl the large hall, which was crowded to the doors and dow main staircase by the fellows and their guests. It most impressive and colourful ceremony. The hon fellows were introduced by the learned clerk of the Fa Mr. T. L. Grahame Reid, whose orations though brief as vivid as they were felicitous. After the confer congratulatory messages were presented by the pres of the sister corporations of the United Kingdom and t Principal of the University of Glasgow. Professor Cat thanked the Faculty on behalf of the honorary fe Pointing a warning finger at the principal of Gl University, he explained to Sir Hector Hetherington tha honorary fellowship did not entitle him to practise physi

DINNER

The celebrations were rounded off with a dinner in faculty hall on Nov. 29—the penultimate day of the m mentioned in the charter 350 years ago. Wit and inge were well matched in Prof. G. B. Fleming's comprehe speech when he toasted The Guests. The Lord Pre replying for the guests, expressed the pride which the felt in having such a lively Faculty in its midst, an personal relief that the fellows were too well behaved vidually and collectively to be a source of trouble to magistrates. He attributed to Professor Fleming the wr of the very attractive prescription that appeared on menu card and which included Amontillado, Chateau Le Barton 1934, Clicquot 1937, and Cockburn 1927; adding he felt that the time had come to transfer his Nati Health Service card to Professor Fleming's file. Sir He Hetherington, proposing the toast—The Royal Facult Physicians and Surgeons—said that the old feud bet y and University was long past and only of historic t. But the Faculty still had a very important part r in fashioning the National Health Service. He added at there were movements afoot in medical education, lly in postgraduate education, which made it imperative he Scottish corporations and the Scottish universities keep the subject under continuous examination.

COMPLIMENTS FROM THE CITY

close relationship, harmonious and otherwise, that has s existed between the Faculty and the Town Council raciously acknowledged by the Lord Provost and ration of Glasgow at a reception held in the city ers. Acknowledging this happy gesture, Mr. Walter ith (visitor) pointed out to the Lord Provost (Mr. Warren) that in receiving the Faculty so hospitably orporation were faithfully observing the injunction ned in the charter wherein the bailies were instructed sist, fortify, concur and defend" the brethren of the ty. On the following day the Faculty returned the iment by entertaining a number of representatives of rporation at a luncheon in the Faculty hall. As a further of good will the corporation organised an exhibition licine in History" at the Art Gallery, whose director Thomas Honeyman, F.R.F.P.S., commemorating advances dicine and surgery with particular reference to the layed by the Glasgow school and fellows of the Royal ty of Physicians and Surgeons.

MEDICAL RESEARCH AT HOSPITALS

E Ministry of Health has sent the following memo- um to regional hospital boards, boards of governors, management committees :

> The Minister has had under consideration, in consultation the Medical Research Council, the general policy which d apply to the promotion of medical research at hospitals. ls and committees will be aware that Section 16 (1) e National Health Service Act, 1946, extends the powers e Minister under the Ministry of Health Act, 1919, to e him to conduct, or help others to conduct, research any matters relating to the causation, prevention, osis, or treatment of illness or mental defectiveness; hat Section 16 (2) of the Act confers similar powers to act (but not to help others to conduct) research, on nal hospital boards, boards of governors, and hospital gement committees.
>
> The constitutional position of the Medical Research il enables that body to promote a wide programme of rch in medical science, free from territorial or adminis- ve limitations of function, and to coöperate with all rnment departments concerned in any way with practical lems of health. In exercising its own powers, the Ministry hitherto in practice confined itself to promoting such tigation as can best be done within the framework of ealth services for which it has immediate responsibility. Council has been left with the wider, and particularly the term, problems of medical research: these include y which fall administratively within the scope of rtments other than the Ministry of Health.
>
> The fact that the Minister is now responsible for the ital services does not in his view, and that of the Medical arch Council, involve alteration of the principles governing agreed division of functions as regards promotion of rch. It is recognised that a good deal of research work ow being carried on in hospitals (apart from research ied out by medical schools and postgraduate institutes which the Minister is not financially responsible) and Minister does not propose to ask boards and committees ost this separately at this stage. He thinks it right, ever, to ask boards and committees not to promote any research work involving additional expenditure from r ordinary budget without his prior approval, in order he may consult the Medical Research Council and re a proper measure of coordination. So far as research nced from "free monies" is concerned, the Minister has desire to interfere with the discretion of boards and mittees in this matter; but he would be glad if they ld indicate in broad terms each year when submitting ir accounts the research projects on which free monies are ng spent and the amount of the expenditure involved.

Parliament

Corrective Training

IN raising this question in the House of Commons on Dec. 2, Mr. J. C. MAUDE, K.C., said that probably the one outstanding feature of the new Criminal Justice Act, which gave hope of better things by way of the reformation of prisoners was the provision for corrective training. He did not blame the Home Office because they had not been fully prepared to put this provision of the Act into operation. But he did want the judiciary, when they sentenced men and women to corrective sentences, to know exactly what those sentences meant. On Oct. 4, of the 732 men and 36 women prisoners who had received sentences of corrective training, 389 men and 8 women were in fact in local prisons. Mr. Maude suggested the Lord Chancellor and the Home Secretary might arrange for private meetings, at intervals of two years or less, where the Judiciary, including recorders and chairmen of quarter sessions, would hear from the Prison Commissioners how far it was thought they were being successful with their sentences, and in what way they could improve them by being instructed in a certain amount of follow-up information on the cases. He believed that unless there was a stronger link between the prison commissioners and the Judiciary, the time would come when we would find the present system to be hopeless. The proper thing was to have indeterminate sentences, so that a judge passed a sentence that a man was to be detained for a period, and some other body decided exactly how long the period should be.

Mr. GEORGE BENSON believed that the whole corrective training experiment was in danger of breaking down under the weight of the sentences passed. Something like 900 sentences of corrective training had been passed in a few months, and the Prison Commissioners were incapable at present of dealing with more than a fraction of that number. A large proportion of the corrective trainees would have to be accommodated in local prisons where any attempt at training was little more than a farce. Again, sentences of preventive detention, which might range from 5 to 15 years, were not imposed for punishment but for the purpose of safe custody. It was outrageous to impose these sentences unless custody was vastly different from ordinary prison conditions, yet under the dual-track system adopted by the Prison Commissioners a portion of preventive detention must be served in a local prison. Follow-up, he continued, was the key to any increase in accurate knowledge with regard to sentencing and the treatment of delinquency. But some years of intensive research were required, based on accurate information as to what happened, not merely to delinquents in bulk, but to specific types. There had been a certain amount of background research in juvenile and adolescent delinquency, but what was really needed was a carefully controlled system of follow-up and the application of a scientific system.

Mr. K. G. YOUNGER, under-secretary of State for the Home Department, in his reply, agreed that preventive detention was essentially a preventive measure, though as much training and reformative treatment as possible was incorporated. The initial stage was served in a local prison, but the remainder of the sentence would be spent at a central prison, which it was intended should be Parkhurst. During their last year suitable prisoners would undergo a course of readaptation for civil life at some new establishment which did not yet exist. As the system only began in April and the minimum sentence was 5 years this was not yet urgent.

Most of the people sentenced to the new form of corrective training were people with a considerable number of convictions. The object of the training was to give a sense of responsibility, and the main method used was a hard day's work, with the satisfaction that came from it; particular effort was made to make it useful work. The trainees also got vocational training and facilities for education superior to what they would get in an ordinary local prison. Moreover, they got a good deal more free association at meal times and at times of recreation.

As there was no spare space in prisons when this system was introduced, the Prison Commissioners could not be expected immediately to make suitable provision for the large number of people sentenced. Chelmsford prison was ready for 208 people when the system was introduced. Since then two wings at Liverpool prison took 221 people, and one wing at Wormwood Scrubs a further 340. That made a total of 829 as against the 1028 who had been sentenced. It was hoped to add another wing at Wormwood Scrubs and an open camp to relieve the present congestion. The Home Office and the Prison Commissioners were anxious to give the courts every help they possibly could. But such guidance must wait to some extent on experience. None of these people had been undergoing this treatment for more than six months. Some were certainly not responding freely to it; though even then it did not follow that on the information available it was unreasonable for the court to decide to give this form of sentence. Sentencing was a matter for the courts, and all that the Home Office could do was to submit reports and information, and, if asked, to give advice and make recommendations. The final judgment must rest with the courts. There was no objection of which he was aware to the holding of conferences as had been suggested by Mr. Maude.

Mr. Younger pointed out that corrective training was a vague and indeterminate subject which lent itself much less readily to scientific research than, say, a physical ailment. While he believed that a scientific method could be applied to this problem they had been obliged to avoid launching large and expensive schemes of research; but the Home Office was at present considering what they could do to improve, both on the statistical side and on the side of case work, following through the individual cases from the court to the training and to the results of the training.

Amending Act

In the House of Lords on Dec. 1 the National Health Service (Amendment) Bill was read the third time and passed.

QUESTION TIME

Selection of Medical Students

Mr. PHILIP PIRATIN asked the Secretary to the Treasury what were the qualities sought for by the boards of medical schools in determining the suitability for the medical profession: and if he was satisfied that these qualifications, other than scholastic, were such as did not prejudice the acceptance of working-class students.—Mr. GLENVIL HALL replied: The selection of candidates is entirely a matter for the authorities concerned and the medical schools are no exception to this general rule. I have no reason to suppose that the basis of selection adopted is in any way prejudicial to students from working-class homes.

Committee on Industrial Health

Viscountess DAVIDSON asked the Prime Minister if he would add a State-registered nurse to the committee on Industrial Health Services, the membership and terms of reference of which were announced on June 1, 1949.—Mr. C. R. ATTLEE replied: I have appointed Miss M. M. Edwards, M.V.O., S.R.N., S.C.M., director of nursing services, King Edward's Hospital Fund for London, and Miss E. M. Gosling, S.R.N., S.C.M., of Unilevers Ltd., to be members of the committee.

Hearing-aids for Scotland

In answer to a question Mr. ARTHUR WOODBURN, Secretary of State for Scotland, stated that the rate of issue of 'Medresco' hearing-aids in Scotland was now about 360 aids per month. Over 3500 in all had already been supplied.

St. Luke's Hospital

Mr. F. E. NOEL-BAKER asked the Minister of Health whether he would arrange with the regional board to make available to the governors of Queen Charlotte's and Chelsea Hospitals a part of St. Luke's Hospital for teaching purposes.—Mr. ANEURIN BEVAN replied: I am aware of the need for additional accommodation at the Queen Charlotte's and Chelsea Hospitals. It will probably be impossible to make any part of St. Luke's Hospital available for this purpose, but I am considering other possibilities.

Diabetic Chocolate

Commander A. H. P. NOBLE asked the Minister of why there was a shortage of the rationed chocolate prepared for diabetics.—Dr. EDITH SUMMERSKILL The supply of diabetic chocolate is limited by the of sorbitol which is an essential ingredient. I am there is little prospect of obtaining additional

Handicapped Children

In answer to a question Mr. GEORGE TOMLINSON, of Education, stated that the numbers of ch from hearing defects and speech defects noted at inspections during 1948 were approximately 19,000 20,000 respectively.

Mr. F. W. SKINNARD asked the Minister wh regulations permitted local authorities, which could present provide sufficient places for mentally seriously retarded children, to reimburse parents who their children to private clinics and occupational Mr. TOMLINSON replied: The Education Acts prohibit education authorities from incurring expenditure on defective children, that is to say children found to be able, and they are therefore not concerned with the ments made for the care of such children in occup or otherwise. For educationally subnormal children, my approval, some use is made of independent school of home tuition in appropriate cases. The Acts parents to make their own provision for these children is satisfactory, but if the authority is asked to take fin responsibility it is for them to consider what educat provision is appropriate in the light of the available faci

School Dental Service

Mr. PHILIP PIRATIN asked the Minister what ratio be laid down of school dentists to school-children, and how more dentists would be needed to reach this Mr. TOMLINSON replied: For a complete service of inspection and treatment, it is estimated that a ratio of 1 dentist to 3000 children would probably be required January, 1949, the latest date for which figures are a the number of school dentists employed by local was equivalent to 868 whole-time officers. To give a 1 dentist to 3000 children, an additional 975 would then been required. Since then, there are indications that number has seriously decreased.

Epileptic Patients

In answer to a question Mr. ARTHUR BLENKINSOP rep The number of persons in epileptic colonies in England Wales at the end of October, 1949, was 2604.

Hearing-aids

Replying to a question Mr. BLENKINSOP stated that, Nov. 5, 39,159 patients in England and Wales had supplied with medresco aids, and the current average of issue was 1015 a week. Waiting-lists totalled about 36 The staffs of the distribution centres were being incre and new centres would be opened as soon as possible.

Treatment of Leprosy

Mr. G. C. TOUCHE asked the Minister of Health how the St. Giles Home near Chelmsford had been used for treatment of lepers, and whether during that period cases had arisen of this disease being contracted by pe in the neighbourhood.—Mr. BLENKINSOP replied: I un stand that the home has been used for 35 years and tha cases of local infection with leprosy are known.

Shortage of Staff in Tuberculosis Sanatoria

Sir ERNEST GRAHAM-LITTLE asked the Minister how m hospital beds for tuberculosis patients were unoccu through lack of nurses; and what measures he was propo to take to make these beds available for tuberculosis pati in view of the rapidly rising mortality from tuberculo Mr. BEVAN replied: About 4400 beds in sanatoria tuberculosis hospitals are at present unoccupied for lack staff. Nursing staff in these institutions increased in year ended June 30 by 774 full-time and 319 part-time, in the same period 652 beds were re-opened. Apart from few slight fluctuations, tuberculosis mortality in relat to population has steadily fallen for several years past, touched a new low record last year.

In England Now

unning Commentary by Peripatetic Correspondents

E myopic Mr. Thurber has written an enchanting e about what he sees—or thinks he sees—when he nislaid his spectacles. Being hard of hearing has ar compensations for the patient if not for those ad him. Thus, it is with pleasurable surprise that arns from the B.B.C. that tomorrow's weather will unny or that he is about to listen to Vaughan-ams's "Masque of Joad." He has his disappoint-s, of course, as when his wife tells him that she is ting of biting Mary today, which would be obviously a more sensible than merely inviting her to stay; hen the rural postmistress over the telephone tells that she can't afford a piece of snoek, spurns his of financial assistance, and says that there is a call ord to see Mr. Stook. He may think his partner ly modest when he overhears him telling the patient ne next room that any fool can cure the varicose , till he finds him writing a script for penicillin

* * *

ree days out from England an American student, rning from an extensive and hectic European tour, plained of feeling seedy, and next morning there was it weakness of his left arm and a board-like feeling ss his back—that is how it all began.

is condition changed for the worse, and it seemed ible that from being a case in the medical diary he ht become an entry in the ship's log. A senior sician returning to the States agreed that an iron-lung ht be necessary, and after consultation with the ain and purser signals in code were made to the ping company's New York office. Regular bulletins wed, all help was promised, and news came through the mechanical respirator and physician-operator ested were on their way. Not until we altered course ards Halifax to rendezvous with the coastguard cutter the crew and passengers know what was afoot, and a then only by accident. "I know your little game," the bo'sun as he passed in the alleyway. "Heard it me wireless from Halifax radio: 'Iron lung and sician-operator left New York by air for Halifax ight. There they will transfer to the coastguard ter *Coos Bay*, directed from patrol, about midnight. cutter will contact R.M.S. *Parthia* about noon orrow.'" The hurricane that devastated Florida just passed to the south'ard, and there was a roughish as the cutter's skimmer came alongside next day. st the apparatus and then the personnel were hoisted ard in the "sling." The transfer took three-quarters an hour; it was quite a risky business.

Ve had no 'Furmethide' on board; so when the sician from the National Foundation for Infantile alysis thought the patient would need some he lioed for the drug to be flown to the ship. In a sur-singly short time the plane was circling overhead. had altered course so as to steam head to wind, and r men manned the derrick-cranes, each bearing a long ite pennant (in less nautical language, a piece of torn ite sheeting) to act as a wind-sock. The pilot made run-in from over the stern at mast-height and the ious package was dropped amidships, but a strong nd caught the parachute and a direct hit became a ar miss—the furmethide was in the drink! Then we e-to and a volunteer boat's crew was mustered from e watch-below. By this time the passengers who had en the morning rendezvous with the coastguard cutter ere gathering on deck and showing great interest in is latest feature of the ocean drama; but few, if any, ppreciated the risk to the boat's crew with such seas nning. The position of parachute and package was arked on the grey-blue sea by a patch of brilliant ellowish-green fluorescence which the boat soon reached. he 'chute was waterlogged and had to be hauled like big draught of fishes into the boat. They pulled back for n interminable procession of minutes, but at last they eached the safety of our lee where oil had been pumped n the waves from a hose through a low-placed scuttle. Hoist away!" The boat was safely up, and crew and package were soon inboard. The package weighed 35 lb.: six ampoules of furmethide weighted with two bricks.

In a ship one lives with one's patients and gets to see some aspects of illness familiar to nurses but not usually apparent to a visiting physician. Our patient was of more than average intelligence, he was well aware of his condition, and he knew that his companion's frenzied demand that heaven and earth be moved, that no expense be spared, that an iron-lung be flown out, &c., &c., had actually been met and the iron-lung was beside him if he needed it; he was unlikely to need it now, for there was no dyspnœa, and yet until the sedatives were increased the fear of dying in his sleep was dominant—damnably so. On the sixth day this fear seemed to leave him and he enjoyed being the centre of an "ocean drama." Afloat he was our chief concern, rather like an only child; I'm certain he felt this when he became a member of the large polio-family at the highly efficient special unit in the New York Hospital (they even have an E.N.T. houseman on duty for emergency tracheotomies in iron-lung cases!) After being the almost perfect patient, he started grumbling about having to fit himself into the schedule of hours and treatments, like a garment in the making on a factory conveyor-belt.

When we docked not only a Scully-Walton (ambulance) but a Hollywood magnum of photographers, reporters, and newsreel and television cameramen awaited us. Our guarantee of full coöperation and a press-conference secured us a calm landing. And did the boys "*go to town*"! We hit the headlines big. But the front-page scoop photograph was the gangway-shot taken by a coastguard from a nearby cabin port-hole.

The postscript came from the return trip. Steward to passenger in the dining-saloon: "No, Madam, the iron-lung did not hit the ship. If the R.A.F. had delivered it we would certainly have been sunk."

* * *

Before going down to the surgery I built up the fire and put the guard in front of it: of that I am quite certain. Nor was I smoking at the time. Ten minutes later my housekeeper, attracted by a smell of smoke, entered the drawing-room to find the rug and carpet both smouldering and the ancient chintz cover on the hassock in like case. Successfully and secundum artem she dealt with the fire. "But," she informed me on my return, "your book's ruined." "What book?" I inquired. "I dunno what book. 'Twas on the 'assick and 'tis ruined." I looked at the book and my heart sank. It was THE LANCET for Nov. 26 containing one of my own contributions. Feverishly I turned the charred pages and found, to my intense relief, that I.E.N., though as full of dry humour as ever, had survived the blaze.

* * *

This is the tale of Willie Squeers,
Who'd been at "Restham" twenty years
With one Idea fixed in his head—
That all this time he had been dead.

The Doctor, honestly no doubt,
Tried hard to root this notion out:
"Surely," he asked, "the Dead can't bleed?"
And Willie readily agreed.

"If on your finger, then, I made
A little snick with scalpel blade,
Although it possibly might hurt,
Should we expect the blood to spurt?"

"Of course not," Willie said, "I'm dry
As dust, or dehydrated pie."
But when they put it to the test,
Poor Willie bled like all the rest.

"I'm wrong," he cried, "for years on end
I must have been right round the bend;
But now, from all delusion freed,
At last I know: dead men DO bleed."

Letters to the Editor

CONTROL OF TUBERCULOSIS

SIR,—Many facets of this national problem are now coming under review, and such revision should be helpful. We are concerned to notice one retrograde proposal: the suggestion has been advanced that the chest-clinic physician should have personal control of patients under *treatment in the sanatorium, as well as* at the clinic. The sanatorium physician would thus be displaced, and daily charge of patients would be given to juniors, controlled by the occasional visit of a busy clinic physician. We feel that this policy can only endanger the good treatment of the tuberculous patient, leading finally to more delay in obtaining treatment of those yet to be diagnosed.

Tuberculosis sanatoria, except for certain small establishments, are more properly designated tuberculosis hospitals, for such a term conveys more clearly the present position of such institutions as major therapeutic agents. Modern treatment means much more than the old simple convalescent régime, as most people know; it has become an intensive process, calling specialised teams of physicians, surgeons, pathologists, and nurses. Patients have to spend much of their stay in bed; and the stay is of necessity long, lasting on average at least six months. Recent contributors have shown how effectively a certain proportion of patients can be treated under home conditions, and are being so treated. Such policies, together with advances in therapeutics which have brought *many more patients into the* "treatable" category, have inevitably tended to lengthen somewhat the stay of patients, but this has been controlled by diminishing the period of treatment in the institution when the patient has become ambulant. Nearly all tuberculosis hospitals have less than 20% of patients up for more than a few hours each day, though nursing shortage has prevented the full exploitation of bed rest, and most hospitals have perforce reduced their standard of medical treatment in this respect.

In addition to these important therapeutic functions, such hospitals have the duties of training potential specialists in the field of tuberculosis, and of postgraduate and undergraduate teaching. Further, they must constantly seek to advance medical and surgical practice in the specialty, and in many aspects this can only be done effectively by the study of sufficient numbers of patients treated in hospital.

These complex and integrated tasks can only be carried out by those who have the opportunity to keep largely to this work: they cannot be done by hurried visits from doctors who have heavy commitments in the clinics. To administer and practise in a clinic serving a population of 200,000 people is a large task, even with adequate assistance. Such a clinic has vitally important work in the environmental and the preventive spheres, and in the detection and the supervision of tuberculous persons and their contacts. Dr. F. R. G. Heaf, in his presidential address to the British Tuberculosis Association, has recently emphasised the range and importance of these tasks. *It would be a mistake if these were left* imperfectly done for the sake of undue concentration on bedside treatment of hospital patients, which is already more effectively performed by the sanatorium-hospital teams.

The tuberculosis hospital, in carrying out the work described above, becomes a unity which must not be broken. The morale and corporate spirit of such a hospital is a vital matter for the welfare of patients who have to stay so long, and we are convinced that the power and efficiency of the hospital would suffer most seriously if the skilled teams of medical staff were exchanged for large numbers of visiting clinic physicians, each in charge of a few beds. Nurses and clerical trative officers would have their work *increased and hampered by this multiplicity of* staff.

Clinic physicians generally have beds under charge in a local hospital, and such beds are a feature of clinic work. There may also be linking a sanatorium with a local clinic, but in event the area managed should be kept small and clinic would in effect be an *outpatient* depa the hospital. These are exceptions to the subject discussion, which concerns the larger sanatorium-h and large urban clinic areas.

Sanatorium staff are equally concerned with colleagues in the clinics at the longer waiting experienced by many patients. As already this is in part due to the very advances in which are doing so much to improve the outlook fo individual patient. Another important cause is continued shortage of nursing staff, who are under great pressure of work. Mutual co solving these and other problems should be a practice, but let us not impair the vitally im work of either branch of tuberculosis control.

Bedfordshire Sanatorium. W. E. MASHITER
A. G. HOUNSLOW
Claro Hall Hospital. F. A. H. SIMMON
Colindale Hospital. W. E. SNELL
L. E. HOUGHTON
Harefield Hospital. K. R. STOKES.
W. S. FOWLER
Pinewood Hospital. J. J. MCCANN.

SIR,—May I reply to some of the comments on letter of Oct. 8? While, as a sanatorium physicia naturally agree with Dr. Temple Clive's cautious atti towards collapse treatment (Oct. 22), I feel that the dismissal of any alternative to the conventional continued sanatorium treatment by him and by Dr. (Nov. 12) does not contribute towards the solutio the problem involved. On the other hand I feel strongly that, whatever are the merits and demerit domiciliary treatment with collapse and with stre mycin, the growing enthusiasm for so desperate an e gency measure should not result in acceptance of perpetuation as Dr. Heller's letter (Nov. 5) seems to im

Dr. Tattersall in his paper on Home Treatment Pulmonary Tuberculosis (Nov. 19), though giving do ciliary collapse treatment its place in an over-all p quite rightly deplores the tendency to retain patient sanatoria for many months, and Dr. Sita-Lumsde his most valuable contribution (Nov. 26) pronou that "the only possible solution of the present shortage is the acceptance by sanatorium physician a shorter stay for their patients." If, as he sugg more patients were isolated at home by the provisio open-air shelters, and if Dr. Rozner's timely suggest (Nov. 26) to utilise the idle beds of isolation hospitals the care of the chronic incurable infectious cases taken up by the authorities, an appreciable contribut to the "control of tuberculosis" would be made. *the same time a great* many precious sanatorium b could be set free for the treatable cases.

No doubt Dr. Pugh hits the nail on the head with eight points. However, his point "efficient means diagnosis at the chest clinic"—to which I should like add "and adequate facilities for modern treatment" touches a sore point *in our* tuberculosis service. necessary decentralisation of the service, with grea emphasis on the chest *clinics*, is, I am afraid, ha pered by the sorry fact that there are not nearly enou properly equipped chest clinics within easy reach of patients' homes. *It is* unrealistic to expect the gr number of obsolete dispensaries—very aptly describ strategically placed visiting stations "[1]—to be ced in the near future by modern chest clinics. a more realistic and practical point of view, there- I suggested for the time being the employment of le chest clinics[2] at places where the essential ties are lacking. With such facilities—whether onary or mobile—an appreciable number of sana- m patients, if properly selected, could be returned h more quickly to the chest physician's care without us harm. Such a practice would soon release the so badly needed for early admissions in order to "active treatment" (including streptomycin) in sanatorium rather than in the patient's home.

an alternative to the present unworkable system of -term sanatorium treatment for the few and too long a ing period for the many, such a scheme is preferable, lieve, to the courageous but undesirable expedient lomiciliary collapse and/or domiciliary streptomy- treatment. I would gladly welcome any constructive cism of the scheme which I have described in more il in the *British Journal of Tuberculosis* (April, 1949).

olywood Hall Sanatorium,
Volsingham, Co. Durham.

E. G. W. HOFFSTAEDT.

B.C.G. VACCINATION

IR,—I should like to thank those who have accepted incursion[3] into the subject of human tuberculosis such a generous spirit. May I reply to two ers?

iscussing the work of Ferguson and Simes. Prof. dford Hill (Oct. 15) asks why, "with the careful hod of allocation laid down, should 35 control infants only 2 vaccinated come into the groups watched for 15 years? Why, reversing the situation, should there 39 vaccinated against 2 controls watched for 12–13 rs?" The answer is, perhaps, that the trial began, years before the paper was written, as a result of ervations on largely unvaccinated children. The hors doubtless wanted to include these observations, in order to make the numbers equal they had to cinate an excess of children in the second two-year iod. The more precise standards were then laid down, in writing their report the authors overlooked the t that 12–14 years previously they had not adhered to se criteria. Professor Hill complains that in subsequent rs the groups were not always the same size; yet the areful method of allocation laid down" was: "All ldren born into the families of Group A were vaccinated one year, while all children born into families of Group in the same year were taken as controls. In the lowing year this situation would be reversed and so throughout the duration of the study." Perhaps e unfortunate investigators were not able to exert lequate statistical control over the number of children m into two groups of Red Indian families in successive ars. Yet what do these *gross* (Professor Hill's italics) ferences amount to? In the first two two-year periods ere was a large difference in the number of control vaccinated children, but this involved only 112 out of 3 children. But there is little reason to believe that the sults on these children were worthless, and Professor ill fails to mention that 73% of all the vaccinated and ntrol children lived in the same families. The remaining 7% came from families that had either all vaccinated r all control children.

He next discusses Ferguson and Simes's data on the nvironment. In the first place it should be pointed ut that even if these data are wrong they in no way ffect the validity of the trial; they are merely included to provide a background to the study. After quoting table III of Ferguson and Simes he writes:

> "These figures are said to reveal 'the infection rate among the controls using only those controls that had adequate tuberculin information.' We may waive the point (to which incidentally no attention is paid) whether these cases are a representative sample of all the controls. For the main issue is, how do the authors come at all by 157 controls observed year by year for 15 years? There is no such group in their control data—indeed only 37 have been followed for more than 12 years."

Here Professor Hill is, I think, quite right: it seemed clear to me when reading the article that these 157 children were another group altogether, whose tuberculin reactions were studied, and the information was included for general interest. It was, of course, strictly incorrect to call them "controls"; but it is really going rather far to suggest that two authors would get confused between 157 controls observed for 15 years and 37 controls observed for 12 years. It may just be mentioned that the favourable results were obtained without isolation of the vaccinated children.

It is perhaps natural that the impression left by my article should be that a controlled trial is unnecessary; but in the summary I said that "what is required is not so much an 'adequate trial' of B.C.G., as a campaign which will begin a new 'sanitary revolution' and control of the last of the great zymotic diseases in Great Britain." I think this is true, and it seems doubtful whether one is justified in carrying out a controlled trial on children or adolescents specially exposed to infection. On the other hand, everyone interested in tuberculosis will endorse Dr. Young's plea (Dec. 3) for a more intensive study of the whole subject of resistance to tuberculous infection, and there seems no doubt that an extensive controlled trial of B.C.G. should be carried out on a section of the general population—i.e., those persons not known to be exposed to special risk. During this period improved methods of producing and standardising vaccine should also be studied: the Scandinavians improved on the original methods of producing and standardising the vaccine, and I understand that important new improvements in potency, and uniformity of production, are being made in America.

As Dr. Young says, the experiments of Watson and those of Young and Paterson[4] show that the resistance of vaccinated cattle may ultimately be lower than that of controls: but the differences in the pathology of human and bovine tuberculosis[5] make it appear unlikely that one can transfer data about events in the "post-primary" stage of infection from one species to the other. Dr. Young states that "while it is true that man has a greater capacity than the lower animals for developing a lasting immunity when exposed to infection with virulent bacilli, his reactions to vaccination with an avirulent strain must be similar to those of the lower animals." I know of no evidence to support the last part of this statement, and it seems rather illogical.

The difficulty of this whole subject of active immunisation to tuberculosis can be illustrated by a quotation from Pinner and Kasper[6]:

> "Since under well-controlled experimental conditions it was shown that reinfection, frequently repeated (at different intervals), may either enhance or depress immunity, it seems hardly justified to postulate that the same mechanism should, under the more complex conditions of human life, act always one way, in other words, that repeated infections should cause the more malignant forms of tuberculosis in the Negro" (p. 487).

It is known that tuberculous infection does occur in vaccinated persons (just as reinfection occurs in persons with a "healed" primary complex) and this infection has a greater tendency to form a healed primary complex than in unvaccinated persons. Unless one assumes that it is desirable to have active tuberculosis in order to be exposed to as much antigen as possible, it seems unreasonable to believe that, under the "complex conditions of human life," the healed primary complex in a person vaccinated with B.C.G. is not as often beneficial as the healed primary complex in an unvaccinated person. At the very least it seems preferable to active disease or death. Pagel and his colleagues [7] have summarised the position admirably:

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[1] Ridehalgh, F., Aspin, J. *N.A.P.T. Bull.* April, 1949.

[2] Information about technical details, price, and delivery of the Mobile Chest Clinic can be obtained from Messrs. Hill Bros. (Hull) Ltd., 27, Park Street, Hull.

[3] Francis, J. *Lancet*, Sept. 24, p. 549.

[4] Young, J. A., Paterson, J. S. *J. Hyg., Camb.* 1949, 47, 39.

[5] Francis, J. Bovine Tuberculosis, including a Contrast with Human Tuberculosis. London, 1947.

[6] Pinner, M., Kasper, J. A. *Amer. Rev. Tuberc.* 1932, 26, 463.

> "There is now ample evidence to prove that at least one reliable, safe, and sufficiently successful agent conferring partial immunity (against tuberculosis) exists. . . . It is essential to be clear as to wherein the efficacy of B.C.G. lies. Its specific value lies in the protection it confers against the risks attendant upon primary infection acquired in the ordinary uncontrolled manner. The main fall in incidence of tuberculous morbidity takes place therefore in such illnesses as are consequent upon primary infection—namely, hilar adenitis, epituberculosis, erythema nodosum, pleural effusion, tuberculous meningitis, and generalised miliary tuberculosis. As regards phthisis B.C.G. does not confer immunity directly as the vaccinated individual is merely transposed from the tuberculin-negative to the tuberculin-positive group and probably enjoys no more immunity than the person who acquired his primary infection in the ordinary way. It is possible, however, that in the case of tuberculin-negative adolescents and young adults (in whom phthisis may rapidly follow the primary infection), B.C.G., by helping to minimize the effects of the initial infection, thereby indirectly contributes towards *preventing the development of phthisis at a relatively early date*" (pp. 678 and 680).

Dr. Neville Irvine came to a similar conclusion after a detailed study of all the evidence.[8]

As Dr. Young points out, the effect on phthisis in middle or old age can be ascertained only by the large-scale use of the vaccine under controlled conditions for many years; but this does not mean that the groups of tuberculin-negative persons should be exposed to special risks of infection for many years. It may be noted that Young and Paterson [4] advocate vaccination of cattle, despite the known fact that it may sometimes lead to an eventual reduction of resistance.

Clearly there are many problems to solve before we understand all the mechanism of resistance to tuberculous infection; but no-one has questioned my conclusion [3] that the evidence supporting the value of B.C.G. is better than the evidence supporting the value of any other immunological procedure used in man. Even, therefore, if vaccination did lead to an increased susceptibility many years later (and there is very little evidence to support this view), most people might be inclined to use the vaccine, because there is a natural human tendency to postpone death and other unpleasant events for as long as possible. In any case, one hopes that with the help of B.C.G. the degree of exposure to infection will be reduced during the next 20, 30, or 40 years.

Bramhall, Cheshire. JOHN FRANCIS.

CHILDREN REFERRED TO THE PSYCHIATRIST

SIR,—May I, as a psychiatrist, put in a plea for a more balanced attitude towards those childish conditions which depend on both physical and mental factors combined in varying proportions? Nocturnal enuresis, stammer, and academic failure due to specific learning difficulty are common examples of these. And they are so often referred to the psychiatrist with the comment "I can find no physical cause. . . ." And the psychiatrist is not always without blame: "These are always psychological in origin."

Enuresis may start in over-meticulous toilet t
linked with [illegible] rsistence us
depends on [illegible] of a dec
bladder capacity. The voiding reflex acts before su
tension exists to arouse a definite sensory imp
so, in sleep, it can occur without waking the pa
Stammer often depends on confused lateral ce
dominance, which may show itself also in cr
laterality of hand and eye. School failure, in intel
children, due to backwardness in the basic sub
usually stigmatised as laziness, inattention, or la
effort, is commonly the result of crossed laterality.

Though the basis of these troubles is so often ph
by the time the child is brought for advice the con
is usually vastly complicated, and fixed, by seco
psychological disturbances in both the child an
parents. And the sufferers are often children of ne
temperament to begin with.

Treatment, to be effective, must take all these f
into consideration. A one-sided approach is s
satisfactory, and is responsible for much of the con
of thought and pessimism that surrounds these ail

London, W.1. WILLIAM MOO

OBSTETRICAL BRAINS TRUST

SIR,—In your report (Nov. 26) of the obst
brains trust, I read that Miss Josephine Barnes ans
"yes" to the question "can ovulation occur
puberty?"

Is it not true that, though for convenience we r
regard the first *menstruation* as the onset of pu
this is *only* because of the difficulty of deter
when ovulation first occurs? And it is this first ov
which marks the exact beginning of puberty. I
case, however, the question presupposes the kno
that ovulation has occurred, so that this difficult
not exist and the patient has therefore entered pu

My interest in this subject arises from a study
making of sexual precocity and the need for keep
the definition of spermatogenesis in the male and
tion in the female as evidence of puberty. A gra
cell tumour of the ovary in a child will cause menstr
but not ovulation, and therefore, although it pr
sexual precocity, *it has not produced* precocious pu

HUGH JO

The Hospital for Sick Children,
Great Ormond Street,
London, W.C.1.

CHLOROMYCETIN AND SULPHADIAZINE TYPHOID FEVER

SIR,—I should like to report the following c
typhoid fever treated with 'Chloromycetin' and s
diazine.

A girl, aged 9 years, had complained for a week of he
general malaise, and feverishness, especially in the afte
She was constipated. On examination, on Oct.
temperature was 40°C, and the pulse-rate 120 pe
The tongue was dry and furred, the abdomen tym
and the spleen enlarged three finger-breadths bel
costal margin. There was no rash on the abdomin
Two days later the blood Widal reaction was positive I

On the evening of Nov. 1, the temperature was still
and sulphadiazine 2 g. daily was started. At 6 A.
next day chloromycetin was started 2-hourly in a
of 1 g. for the first three doses and 0·25 g. subseq
That day she vomited twice; at 6 P.M. the temperatu
37·3°C, but the patient was still toxic. On Nov. 3 the te
ture in the morning was 36·5°C, and in the evening 3
the general condition was slightly better, but the
vomited several times. Both drugs were stopped a
vomiting ceased.

On the evening of Nov. 5—i.e., after a rest of 48 h
the temperature was 37·5°C, and chloromycetin was re
in doses of 0·25 g. 4-hourly together with 2 g. of sulpha
daily for another 48 hours, at the end of which the temp
was normal and the general condition much better
total amount of chloromycetin given was 9 g.
sulphadiazine 10 g. Hitherto there has been no relaps

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[7] Pagel, W. in Kayne, Pagel, and O'Shaughnessy's Pulmonary Tuberculosis. London, 1948.

[8] Irvine, K. N. B.C.G. Vaccination in Theory and Practice. Oxford, 1949.

end of the fever by crisis within 12 hours of g treatment was very striking. I can only n this result by the effect of adding sulphadiazine oromycetin.[1]

an-Jordan. M. RAZZAZ.

HE HEALTH OF NURSES IN HOSPITAL

—The value of Dr. Court's article—and it has —will be measured by the efforts made in future rd the nurse's health.

Prophit Tuberculosis Survey showed that of the groups investigated the incidence of tuberculosis in the following descending order: (1) contacts open infection; (2) nurses in general hospitals g all classes of patients; (3) nurses in acute general tals; (4) medical students; and (5) controls. evidence in itself is a serious reflection on the ng and care of nurses. The infectious nature of the se and the means by which it is spread are known. itals are specially designed to assist in cure and have acilities to seclude infectious disease: even typhoid e nursed in a general ward. Yet, even in a teaching tal, we see the blame for infection of nurses focused e "symptomless" patients—or rather on undetected of active tuberculosis being treated for something n the general wards.

rses in training today are receiving lectures, and xpected to answer examination questions, on subjects beyond the requirements of their duties; yet rently the vital training on how to take care of selves against infection from any patient is sadly cted.

t is the doctor right in blaming the hospital? It serious matter to do so, for if the nurse is so infected, not our duty to see that she receives the very heavy pensation she might reasonably claim, as in other erous occupations? In the acute general hospital incidence of open tuberculosis among patients is umably only that of the community outside; but chances of infection of nurses outside the hospital surely much greater than in the wards, for our public eyances and public meeting houses contain a higher entration of people than the wards: such places seriously lacking in cleanliness and sanitary pretions, and the people in them are untrained and less. Further I think it might be shown that sing tends to attract young girls who have an unusual eptibility.

hough the hospital may reasonably be exonerated n blame if its cleanliness, ventilation, design, and acity are adequate, and its nurses are properly taught to avoid infection from any patient (whether known be infected or not) it cannot escape blame if it fails give the nurse proper treatment when she is found be infected. Though there is much hypocritical ration of the value of radiography in the detection of mptomless" active tuberculosis, from time to time find evidence that the serial radiographs showing e progressive disease are ignored: the nurse's record ies the entry "Still has no symptoms, and is still duty." There she remains until she goes home on liday, where her parents and the family doctor make e obvious diagnosis. The case-histories cited in the ophit report are illuminating in this respect. The ophit scholars also found that of a group of 31 nurses had definite symptoms which they had not reported. hat standard of training is that?

Nurses have the closest and longest contact of anyone the hospital with emergency patients who are usually o ill to be sent for X-ray examination, as well as with ss seriously ill patients who, unknown to the doctors, ave active pulmonary tuberculosis. It is no credit o the hospitals to admit such active cases in ignorance of their condition; and until we have better security for nurses I believe it is unjustifiable to admit, knowingly, patients with open tuberculosis to a general hospital, even for teaching purposes. It would obviously be to the patient's advantage for his doctors to know that he had active tuberculosis, for this should check rather than incite active surgical treatment. (The "simple" scraping of a localised bone focus, in one such patient, was followed within a few weeks by death from tuberculous meningitis.)

Professor Stammers states that "some would argue that these could be discovered by routine sputum tests instead of by routine radiological examinations, *but this would throw an insupportable extra burden on the laboratories*" and concludes "*the only solution to this problem* is routine X-ray examination of all admissions and *for economy* this should be with the miniature apparatus." He might not have been so dogmatic had he known more of the processes and expenses involved. He goes on to say: "And those who maintain that such a lesion should be recognised in a surgical ward solely by routine clinical examination flatter their surgical colleagues, perhaps because their own line of work no longer puts them to such a test." For myself, I would not even think of such flattery, for on the request forms for X-ray examination I usually see "routine" or "A.P. chest" and no sign at all that any clinical examination has been made. In support of the value of a sound clinical examination I may say I still find minimal radiographic evidence of tuberculosis in patients referred by general practitioners whose examinations have led them to suspect the disease. The carelessness sometimes exhibited in hospital is in contrast with this. To a request form bearing the message "X-ray chest. ? lungs touched," I was prompted—by a radiograph showing extensive tuberculosis throughout both lungs with many cavities in both—to return the full report "Not 'arf."

Birmingham. JAMES F. BRAILSFORD.

THE FUNCTION OF GASTRIC UREASE

SIR,—We have been prompted to write this letter by recent references to the composition of gastric juice [1] and to the significance of hyperchlorhydria as a possible precursor of a later ulcer dyspepsia [2] in connexion with the paper of Doll, Avery Jones, and Maclagan.[3]

The gastric juice has no constant composition apart probably from the primary acidity of the hydrochloric acid in it. In considering the pathogenesis of peptic ulcer insufficient attention has been given to the body's mechanisms for the neutralisation of acid and, above all, to the mechanisms which protect the mucosa from acid-pepsin digestion.

For this reason we feel justified in drawing attention to an important enzyme system which is present in the mucosa and can obviously act as a source of alkali both for local defence of the mucosa and for neutralisation of acid as well. This is urease, which acts in a highly specific fashion upon urea, breaking it down to ammonia and carbon dioxide. Ammonia was first recognised in the gastric juice by Bidder and Schmidt [4] as long ago as 1852, and its probable origin from the hydrolysis of urea by urease was first shown by Luck and Seth in 1925.[5] Linderstrøm-Lang and his collaborators [6] demonstrated by a histochemical technique the distribution of urease in the mucosa. It should be noted that the ferment is present in fairly high concentration in the pyloric region of the stomach, where there are no parietal cells, as well as in the fundus, and also that it is present, in much

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1. El Borolossy, A. W., Buttle, G. A. H. *Lancet*, Sept. 24, 559.

1. Annotation, *Lancet*, Oct. 8, p. 662.
2. Leading article, *Ibid*, Nov. 26, p. 997.
3. Doll, R., Avery Jones, F., Maclagan, N. F. *Ibid*, p. 984.
4. Bidder, F. H., Schmidt, C. *Die Verdauungssäfte und der Stoffwechsel.* Leipzig, 1852.
5. Luck, J. M., Seth, T. N. *Biochem. J.* 1925, 19, 357.
6 Linderstrøm-Lang, K., Ohlsen, A. S. *Enzymologia*, 1936, 1, 92.

lower concentration, in the duodenum. Previous workers have speculated on the function of this enzyme, but no precise experiments have been reported.

Over the past few years we have been working on this problem and certain major conclusions have been reached :

1. Urease is always present in the gastric mucosa, though in varying concentrations depending upon the species examined. Previously this has not been generally accepted, but it is certain that from the frog up to man the stomach always contains some urea-splitting ferment. It is present in somewhat higher concentrations in the fundus than in the pylorus, but the difference between these two parts of the stomach is not so great as between the pylorus and the duodenum. The concentration of the enzyme can be increased by putting the experimental animal on a high-protein diet or by the parenteral administration of 'Urogastrone,' and by other methods.[7] In man the ferment is present in moderately high concentration—approximately the same as in the cat or dog, the two animals with the highest concentration observed. The ferment present was quite enough to neutralise large amounts of acid, and in the case of one cat could form enough ammonia to neutralise 50 ml. of $N/10$ acid per hour—far more acid than is usually secreted by that animal in this time. In man, owing to the obvious impossibility of obtaining suitable specimens, we never have been able to obtain complete quantitative studies; but, in the parts studied, the concentration of the ferment is of the same range in man as in the cat.

2. Oral administration of urea lowers gastric histamine response in both normal subjects and sufferers from peptic ulcer.[8] The percentage depression of the response is constantly greater in normal individuals and in gastric-ulcer cases than in the duodenal-ulcer subject. Recently we have, in a few subjects, administered the urea intravenously in the form of 5% solution in normal saline. The depression of the histamine response has been quite dramatic.[9]

3. Large doses of orally administered urea have been successfully used by us in a series of about 50 cases of peptic ulcer (gastric, duodenal, and anastomotic). The results have in general been satisfactory and on occasion remarkable.[9]

4. In a limited number of [illegible] peptic ulcer we have found [illegible] of urease on the very surface of the ulcer. We are obtaining successful preliminary results with a modification of Sen's[10] histochemical technique for the study of urease distribution in the mucosa. It is hoped to use this in studying suitable pathological material. Urease may be present on the ulcer surface primarily to prevent extension of the ulcer. It is too early to speculate further.

5. The achlorhydria usually found in the uræmic patient may be due to the large amounts of ammonia (as high as 50–60 mg. per 100 ml. of gastric juice) set free in the stomach. The uræmia of a gastro-intestinal hæmorrhage is often associated with improvement of the symptoms and signs of peptic ulcer; and this may, we suggest, be due to a similar response.

There is good reason to believe that urease is very important in the protection of the mucosa against acid pepsin. It may not be the only mechanism, but it is, we think, an important one. Its especially high concentration in the neighbourhood of the active oxyntic cells is far more likely to be concerned with protection of the mucosa against the nascent hydrochloric acid than with secretion of the acid itself as Glick[11] has apparently suggested. If it were important in the mechanism of acid formation, why should it be present where no acid is formed, as in the pyloric region or even the duodenum; and, above all, why should administration of its substrate, urea, greatly lower the amount of acid formed? For the neutralisation of gastric acidity this mechanism is clearly of much significance. It is interesting that the increased base produced will in turn be removed by the liver and the total acid-alkali balance remain undisturbed. Apart from such a mechanism dealing with the extra base, for each equivalent of H ions secreted an equivalent of alkali appears within the parietal cells.[12] The nat this process is discussed by Conway in a "redox" t of gastric production[13] which incorporates and e the previous organic-acid theory.[14]

The normal exposure of the gastric mucosa pepsin must be met by a normal resistance. Bre of this resistance, even in the presence of a no less than normal concentration of acid, may le gastric ulcer. It is highly probable that the exact a of a duodenal ulcer is different and depends mo excessive attack than decreased resistance.

We wish to acknowledge, with thanks, the contin received from the Medical Research Council of Irela

St. Vincent's Hospital and
University College, Dublin.

OLIVER FITZGE
PHILIP MURPH

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[7] FitzGerald, O. *Nature, Lond.* 1946, 158, 305.

[8] FitzGerald, O., Murphy, P. *Ibid*, 1948, 162, 896.

[9] FitzGerald, O., Murphy, P. *Irish J. med. Sci.* (in the press).

[10] Sen, P. B. *Ind. J. med. Res.* 1930, 18, 79.

[11] Glick, D., quoted by Hollander, F. *Science*, 1949, 110, 57.

[12] Hanke, M. E. *Ibid*, 1937, 85, 54.

[13] Conway, E. J. *Irish J. med. Sci.* 1949, 288, 787.

[14] Conway, E. J., FitzGerald, O., Walls, D. *Nature, Lond* 19 156, 477.

CURARE AND PRECIPITATE LABOUR

SIR,—The letter from Dr. Rollason in your i Nov. 19 raises an important issue.

It is suggested that the use of curare for an eme appendicectomy in a patient in her last mo pregnancy helped to precipitate labour and contributory factor in the birth of a stillborn The evidence adduced is by no means convincin the action of one intravenous injection of curare maintained for more than an hour and the fœtal in this case was regarded as being normal and at least 40 minutes after the injection in question. evidence suggests that fœtal distress did not aris *2–3 hours afterwards.*

It is well known that peritonitis from any cau produce a strongly acting uterus which may a to a tonic contraction, and in my *opinion* it is pr that the infective process both initiated labou produced the high tone of the uterus. I do *not* that curare by itself will produce strong contract uterine muscle, since hæmorrhage experienced cæsarean section under curare is considerably more when either a local or a spinal anæsthetic is employed

I hope that any further cases in which fœtal di might be attributed to the use of curare will be publ in order that the safety of this excellent anæsthetic *may be correctly judged.*

Birmingham.

W. G. MU

DEOXYCORTONE ACETATE AND ASCORBIC A IN RHEUMATOID ARTHRITIS

SIR,—The preliminary report (Nov. 26) by Lewin Wassén claiming rapid and astounding improve in rheumatic patients following the combined admini tion of deoxycortone acetate (DOCA) and ascorbic has naturally aroused great interest.

During the past year we have been studying met of measuring joint tenderness, the *power of grip,* circulation, and other physiological data which ma closely related to the rheumatic process, with a vie assessing the potency of anti-rheumatic remedies. present we have in our wards a number of pati suffering from rheumatoid arthritis in whom t factors have been followed closely over periods of sev weeks. 6 cases in whom the rheumatic condition judged to be stable were given a combined injectio DOCA and ascorbic acid as described by the Swe authors, and the results were observed closely du the following two hours and subsequently.

Of these 6 patients 1 claimed relief of pain, 2 sta that their pains were worse, and the remaining 3 no no difference. The patient who was subjectiv improved also showed a very slight decrease in jo tenderness and a slight increase in the power of g remainder there was, if anything, some increase at tenderness and some deterioration of grip but of the changes were significant. We were therefore e to observe any beneficial results from this ned injection.

nay be that Dr. Lewin and Dr. Wassén were study-atients with rheumatic fever, in whom joint dis-y notoriously varies from day to day and even hour to hour; but they do not state how long and hat manner their patients were observed before ing out this important clinical trial.

ims of this kind presented without adequate data nost unfortunate since we must all be eager to try remedy which promises to reproduce the remark-effects obtained with adrenocorticotropic hormone Cortisone' in rheumatic disease. Those of us who had the opportunity of studying the effects of one her of these substances at first hand will have little ulty in recognising similar activity in other remedies, here is a real danger that physicians without this rience may be encouraged to embark on extensive peutic trials with expensive remedies which are st certainly useless if not actually harmful.

eumatism Research Centre,
niversity of Manchester.

J. H. KELLGREN.

TROPICAL POLYPHLEBITIS

R,—In recent years several reports have described cute syndrome of phlebitis and thrombosis of large s accompanied by pyrexia, observed in Northern desia,[1] Southern Rhodesia,[2] and East Africa.[3] erent names, such as primary tropical phlebitis and oathic thrombophlebitis, have been used for the lition, the cause of which is unknown.

ases observed in the Rhodesias have been sporadic ndemic, but the disease described by Manson-Bahr Charters [3] in East African troops was epidemic in acter. The circumstances led these workers to suggest possibility of a virus infection, transmitted, like ctive hepatitis, by the syringes used in venereal-ase clinics for neoarsphenamine injections. Patho-cal studies [4] indicate that the lesion in the active cute phase of the disease is essentially a replacement he media and intima by actively proliferating vascular ue, with associated polymorph infiltration and the sence of scanty but unequivocal cytoplasmic inclusion ies which can be demonstrated by Lendrum's [5] dified phloxin-tartrazine method.

ince the ætiology is unknown, it cannot be affirmed t the diseases seen in the different regions are identical. original reports, however, provide reasonable lence for the assumption that they are identical. This lso the view adopted by the authors quoted above eferring to each other's publications. They consider t the condition may be either a new disease or one ch has only lately been recognised.

he condition is probably neither a new disease nor which has only recently been recognised. For some e an apparently similar condition has been known workers in tropical medicine, though little has been tten about it. In an address to the Royal Society Tropical Medicine and Hygiene in 1930 Castellani [6] erred to polyphlebitis tropicale as a disease *sui generis* of unknown origin. He did not claim to be describing disease for the first time, but gave no previous erences.

Since the ætiology is unknown, it cannot be asserted it the condition described by Castellani is identical h that recently reported in East Africa and the Rhodesias; but his description (with illustrations) indicates that it probably is. Castellani noted that the associated œdema seems to be due to a process of periphlebitis and not to thrombosis of the vein. He emphasised the tendency to recurrence—a feature mentioned also by Manson-Bahr and Charters. Further observations on this disease by those who have the opportunity to make them are likely to be of very great interest.

Stack Medical Research Laboratories,
Khartoum, Anglo-Egyptian Sudan.

R. KIRK.

REGISTRARS

SIR,—Following your leading article of Nov. 19, and the open meeting of registrars at the British Medical Association on Nov. 26 (reported in your last issue), the whole subject of registrars' prospects and conditions of service is now very much in the foreground. I attended the meeting of registrars and was struck by the small number present from the teaching hospitals and the large number from the non-teaching hospitals.

The important question arises—what is the function of a registrar? Before the war registrars were virtually unknown in the non-teaching hospitals, and in the teaching hospitals their chief function was to teach medical students. especially in the more elementary parts of the clinical course. They also helped in the outpatient department, gave general advice to house-officers, and in the surgical departments performed many of the emergency operations. By the benefit of their contact with distinguished consultants and by their own reading and experience they prepared eventually to become consultants themselves. Those that failed to make the grade—and they were not many—always had private general practice as a not very unpleasant alternative.

What, then, is the function of a registrar in a non-teaching hospital, which previously had no registrars? From discussion with colleagues who hold such posts it would appear that they act part of the time as senior house-officers and part of the time as consultants. They are often compelled to be resident the whole time. Medical registrars usually have to act as electrocardiograph technicians and often as laboratory technicians for emergency pathological work. In many cases consultants have far too many beds under their nominal care, and each consultant has one or more registrars who are doing the bulk of the work of the hospital. It is, of course, very convenient for a consultant always to have a deputy at his beck and call, but the comfort of consultants is not the only consideration. At the last meeting of members of the Royal College of Physicians (Nov. 24) I was staggered to hear consultants of non-teaching hospitals discuss the numbers (sic) of registrars each would have under his own jurisdiction. As a result of the many new registrar appointments (some still being advertised) very many men holding such posts have no chance whatever of becoming consultants.

The conclusion is inescapable. Registrars in most non-teaching hospitals are entirely redundant and all such hospitals should be staffed only by house-officers and consultants, as previously. Exceptions should only be made in the case of some large and efficient hospitals with especially able consultants on their staffs, and then the work of registrars should be recognised for what it ought to be—namely, training for consultant status.

A list of hospitals should be drawn up by each regional board or some central body, laying down clearly the hospitals in which registrars should train. This should include only the teaching hospitals (undergraduate and postgraduate), specialised hospitals, and a few—a very few—of the larger hospitals of the type mentioned above. At the same time the number and class of registrar posts should be organised so that in each grade a man

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Fisher, A. C. *S. Afr. med. J.* 1941, 19, 431.
Gelfand, M. The Sick African. Cape Town, 1944.
Manson-Bahr, P. E. C., Charters, A. D. *Lancet*, 1946, ii, 333.
Fisher, A. C., Fisher, M. M., Lendrum, A. C. *J. Path. Bact.* 1947, 59, 405.
Lendrum, A. C. *Ibid*, p. 399.
Castellani, A. *Trans. R. Soc. trop. Med. Hyg.* 1930, 24, 379.

has a reasonable chance (50% or thereabouts) of obtaining a post in the next higher grade, and, in the case of the senior registrar, has about a 50% chance of becoming a consultant. Even this would only allow a junior registrar a $12^{1}/_{2}$% chance of becoming a consultant.

As far as cost is concerned, it would appear that the abolition of registrar posts and their replacement by equal numbers of full consultants and house-officers would make little difference. This, of course, would not solve the problem of many of the present holders of registrarships, and it is therefore essential, if a large number of fully trained and highly experienced doctors is not to be lost to the service as specialists, that regional boards publish as soon as possible consultant vacancies that are likely to be available in the next twelve months.

The outlook for the bulk of the present registrars, both in teaching and non-teaching hospitals, now appears very uncertain indeed; and, as was pointed out at the registrars' meeting, there are probably in no other profession so many capable men nearing middle life with so hazardous a future. If the suggestion here is adopted, at least the next generation of registrars would not be in the same position as their predecessors.

St. George's Hospital, London, S.W.1. G. P. BAKER.

SIR,—I have been reading with interest your leading article and the subsequent letters.

It is clear that many registrars are doing consultant work, and it is also obvious that the great bulk of hospital work is carried out by this class of practitioner. The Spens committee have wisely set a very high standard for full consultants with high remuneration. It will never be possible for this country to afford a large increase in this type of practitioner, even if it were desirable. The solution is to make posts of junior consultant status which carry less pay but are permanent, and from which the holders can apply for senior posts as they become available. Already one authority—Northern Ireland—is adopting this policy and many registrars would prefer this solution to wasting their training and experience.

REGISTRAR.

VITAMIN P AND ANTIBODY PRODUCTION

SIR,—In work that is to be published shortly I have suggested that what appears to be the usual pattern of plasma-protein response to infection—a lowering of the albumin/globulin ratio—is a purposive mechanism developed necessarily by natural selection, whereby the body synthesises antibody gamma-globulin in optimal relation to the lysine in the diet. This indispensable amino-acid must be obtained from the diet; for once deaminated it cannot be reaminated. Quantitatively it is the body's most important indispensable amino-acid, and plasma-albumin contains twice as much as plasma-globulin. Hence a fall in the amount needed for albumin synthesis leaves more available for globulin synthesis (the dietary intake being assumed to remain constant).

Today I came across the statement by Bicknell and Prescott [1] that in disease (presumably infections), but not in health, vitamin P decreases the serum-albumin and increases the serum-globulin. The reference given is untraceable here, but the question arises whether the increase and decrease are due in part to vitamin P or are wholly the natural response to infection. This recalls a case of kala-azar, treated in the Anglo-Egyptian Sudan in the winter of 1939–40, which much impressed me.

I was attempting to ascertain if any nutrient concentrate, given as an adjuvant with the standard antimony-tartrate treatment, would improve our results. Groups on carotenoids, carotene, thiamine, nicotinic acid, riboflavine, ascorbic acid, calciferol, and casein, as compared with controls, showed no difference. I had one bottle of vitamin P ('Hesperidin') tablets, and t there was no chance of getting any more at the time thus running a further experimental group, I ordered tablets to be given daily until finished to a fresh admitted that morning and diagnosed by splenic pun as kala-azar. The patient astonished us all by m an easy and rapid recovery, which is rarely, if e seen in Sudan kala-azar treated with antimony ta No opportunity has since been found to try vitamin as an adjuvant in the chemotherapy of infections, I others more favourably situated may be interested if inferences I have drawn from the statement of Bick and Prescott are correct.

Jiddah, Saudi Arabia. N. L. CORKILL

HÆMOLYTIC EFFECTS OF MYANESIN

SIR,—Dr. Clendon and Dr. Penfold, in their articl Nov. 26, state that "The evidence that some in vascular hæmolysis occurs after the clinical use myanesin is overwhelming."

The evidence may be strong, but it is not absolu conclusive. Our experience at the Royal Vict Infirmary, Newcastle-on-Tyne, leads me to do the occurrence of hæmoglobinuria. Pigmentation of urine—which may be red, green, or brown—has occu in a few cases. This urine gives a positive reactio the benzidine and guaiac tests, but the spectros shows that hæmoglobin is absent. The reactio apparently due to phenolic groupings, presum breakdown products of mephenesin ('Myanesin'). S one body-fluid (urine) can be red from the presenc breakdown products of mephenesin and give pos reactions to the benzidine and guaiac tests, it is impossible that similar events may occur with o body-fluids, and thus the evidence for hæmolysis g by Dr. Clendon's and Dr. Penfold's intere experiments cannot be considered overwhelming, spectroscopy was not employed.

Mephenesin is often used here in anæsthesia in chil in doses of 2 ml. of the 10% solution per stone b weight, which may be repeated if necessary. Its advan in these cases is that respiration is not markedly affe It has been employed in infants only a day old, in the poorest risks, but we have seen no adverse ch effects.

Recently, a boy, aged 13 years, with tetanus treated here with 91 g. of mephenesin in glucose-s by intravenous drip over 4 days. No sedatives employed. The effect was such that blanket baths treatment of pressure areas could be carried out wit initiating spasms. Recovery was complete and t were no untoward effects from the mephenesin.

Much adverse criticism of mephenesin has app in the literature, but unless deleterious effects ca conclusively proved it seems a pity to discourage use of a drug which can be used to obtain such exce results.

M. H. ARMSTRONG DAVISO

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ANONYMITY IN BROADCASTING

SIR,—In your last issue your able correspon "Ignotum pro Magnifico" discussed the com practice of anonymity when doctors broadcast or tele this having been imposed in the past by the G. to conform with the idea of preventing possible adve ing. As I am the person referred to in his letter, I t I should tell him and others what happened in television appearance on diabetes in the medical se Matters of Life and Death.

When first approached by the televisionaries once asked if they wanted to publicise my name as as, inevitably, my face. They were most anxiou do so to give the production "weight and realit them that they must put the matter to the Royal : of Physicians, stating exactly the wording they l to publish. Their formula was accepted, and name and the hospital I work at were published roadcast. The only proviso—very welcome to as that I should refuse any private consultation ; out of the televiewing *unless referred by the 's doctor.* I am glad to report that none has

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[1] Bicknell, F., Prescott, F. The Vitamins in Medicine. London, 1947.

had thought that your correspondent "Ignotum lagnifico" should have remained anonymous, ld have signed myself "Lorenzo il Magnifico"! d of which I am, Sir,

ion, W.1. R. D. LAWRENCE.

ACTINOMYCOSIS

,—In your leading article last week, after describing haracteristics of *Actinomyces bovis*, you say: this reason it cannot survive on natural substrata le the animal body; so infection does not occur external sources but is always 'autogenous.'" ding to the *Shorter Oxford English Dictionary* ogenous" means "self-producing," and Dorland's *ican Illustrated Medical Dictionary* gives "self-ated; originated within the body."

iat actually is implied by the word "autogenous" ur article? The organism must come from some- and surely cannot produce itself from nothing; wise we would seem to be getting back to spon-us generation. From what does it "originate n the body" if "autogenous" is the correct word e?

eleys, Lancs. O. R. L. WILSON

* It was the infection, not the organism, that was genous—infection being "invasion of the tissues ... athogenic organisms in such a way that injury ... ts" (Dorland)—ED. L.

ACUTE MASTITIS

R,—In my letter of Oct. 22 I purposely kept my rks short; but by so doing have evidently left way open for inferences which were never intended; I have been taken to task by Mr. Hughes (Nov. 19). e agrees that it is a common farming practice to calves to suckle cows with mastitis. I said it was old-fashioned. The point was originally raised Mr. Walsh (Oct. 8) in connexion with the dangers h might arise by allowing an infant to suckle an ted breast. Mr. Walsh prefers always to boil the from the affected side; but Taylor and Way[1] did take this precaution, and—like the calf—the infants eared to take no harm. Mr. Hughes is evidently ried that one of my statements may give the impression the farming world is obtaining penicillin prepara-s through illegal channels. I simply said that the wise ner always had his tube of penicillin ointment handy eal with sores on the teats of cows.

am obliged to Mr. Hughes for drawing my attention he third point that he mentions: it is, of course, ved that, judged by penicillin content in the milk, amammary injection of penicillin is vastly superior ystemic administration. But I should perhaps have gested that this method of administration alone is able only for the less severe forms of acute mastitis e., without pronounced systemic upset. In the cow cost often precludes systemic penicillin treatment, I then content myself with sulphonamide therapy the systemic attack. At times indeed the systemic atment seems to be the more important. Generally aking, however, intramammary inoculation is always d at the same time, to provide a double safeguard. ally, I would point to Mr. Walsh's results with temic penicillin only, because in my opinion this makes it amply clear that the concentration of penicillin in the milk is not the only factor to be weighed when judging the efficacy of the various methods of treatment.

Blackburn. A. H. HOGG.

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[1] Taylor, M. D., Way, S. *Brit. med. J.* 1946, ii, 731.

Public Health

Typhoid Fever in Salford

IN the outbreak of typhoid fever at Salford there had been up till last Monday 29 confirmed and 9 unconfirmed cases; 2 patients had died.

All the known cases became infected from meals eaten in October. The dates of the meals known to have been infected are Oct. 6, 7, 8, 27, and 28; and these dates were all before the outbreak became known and hygienic measures (including suspension from food-handling of possible carriers) were instituted. Possibly further cases may arise; there have been at least 2 ambulatory cases where subsequent relapse revealed the nature of the disease.

In all cases and carriers the *Salmonella typhi* has been of the same type—Vi-phage E.1.

Poliomyelitis

During the week ended Nov. 26, notifications in England and Wales were: poliomyelitis 176 (221), polioencephalitis 17 (8). Figures for the previous week are shown in parentheses. The number of notifications of poliomyelitis and polioencephalitis together is now a little higher than it was in the corresponding week of 1947—193 against 145. Of recent years an extension of relatively high prevalence into the winter months has been reported from other countries, and when the next review of the world situation is published by the W.H.O. it will be interesting to see how far this trend is general.

Multiple cases were reported from the following counties:

London 24 (29), Berks 3 (8), Buckingham 5 (3), Chester 6 (0), Derby 2 (1), Devon 2 (1), Dorset 3 (1), Durham 2 (2), Essex 16 (14) Gloucester 8 (8), Hereford 2 (1), Hertford 6 (4), Kent 14 (20), Lancaster 10 (10), Leicester 7 (3), Middlesex 11 (15), Norfolk 12 (3), Nottingham 5 (4), Southampton 4 (3), Stafford 3 (2), Suffolk East, 3 (2), Surrey 6 (6), Sussex, East 3 (4), Warwick 7 (13), Yorks, West Riding 17 (32), Glamorgan 5 (10).

Infectious Diseases in England and Wales

Disease	Week ended Nov.			
	5	12	19	26*
Cerebrospinal fever	18	20	22	32
Diphtheria	86	85	96	121
Dysentery	83	92	116	144
Encephalitis lethargica	1	..	..	1
Food-poisoning	94	50	102	128
Measles, excluding rubella	1083	1055	1307	1469
Ophthalmia neonatorum	35	21	37	31
Paratyphoid fever	7	7	6	11
Pneumonia, primary or influenzal ..	419	534	667	710
Polioencephalitis	12	23	8	17
Poliomyelitis	318	293	221	176
Puerperal pyrexia	65	90	112	87
Scarlet fever	2047	2163	2572	2827
Smallpox	1†	1‡	..	..
Typhoid fever	11	18	21	11
Whooping-cough	898	977	996	1035

* Unrevised figures. † Laboratory infection. ‡ Contact with laboratory infection.

Obituary

WILLIAM ANDERSON

O.B.E., M.B. ABERD., F.R.C.S., F.R.C.S.E.

Mr. William Anderson, surgeon to the Aberdeen Royal Infirmary, died on Nov. 29 at Aberdeen.

Born of farmer stock in the north-east of Scotland, and the eldest of a large family, William Anderson was a typical product of his race and environment. From an early age toil and sweat were familiar and almost congenial companions, and the habits of industry, application, and attention to detail, thus early acquired, became ever more deeply ingrained. In 1909 he graduated M.B. in the University of Aberdeen, and after a series of house-appointments he joined the staff of the Aberdeen Royal Infirmary as honorary anæsthetist, according to the custom of those times. In these early years he was trained by Sir Henry Gray and Sir John Marnoch, and from them he learned general surgery and much else besides.

Having taken his F.R.C.S.E. in 1912 he served during the 1914–18 war as a regimental medical officer—an experience on which he always looked back with special satisfaction—and then had charge of the surgical division of a general hospital in France. For his services he was appointed O.B.E. After the war he returned to the post of assistant surgeon at the Aberdeen Royal Infirmary, only to find promotion to a full charge blocked for many years. He made them, however, years of intensive and fruitful effort, and in 1923 he took the English surgical fellowship. In addition to work as a general surgeon in hospital and private practice, university teaching duties as lecturer in clinical surgery, and research at the Rowett Institute, he found time to initiate a neurosurgical service at Aberdeen; and later, when the need arose, he turned to thoracic surgery. The development of surgical treatment of tuberculosis at the sanatoria in the north-east of Scotland owes much to his efforts. In 1935 he became full surgeon at the Royal Infirmary, and he was also consulting surgeon to the municipal hospital group. An original member of the Society of Thoracic Surgeons, he became its president. From 1941 to 1944 he was also president of the Association of Surgeons. He was a fellow of the International Society of Surgeons.

When the late war came his services as a medical administrator were soon in demand. For a time he was surgical director in the E.M.S. for the north-east and north of Scotland, and later he became consulting surgeon, Scottish command. At the War Office, where the interests of special branches of surgery were sometimes conflicting, Brigadier Anderson's opinions were highly regarded "for their content of practical common sense, tinctured on occasion by a robust scepticism." After the war he returned to civil life with his zest for surgery and for his hobbies—shooting and golf—unimpaired. He had no thought of letting up in work or play, and he died suddenly while attending a law case as medical referee.

A colleague writes: "William Anderson, known to all in his beloved Aberdeen, and to many far beyond, as 'William' or 'Willie,' was a prominent figure in British surgical circles for a generation past. His popularity was assured by unusual gifts of easy and entertaining companionship and by an inexhaustible fund of stories. But that was only one side of the man. He was a surgeon of distinction and achievement and his career was one of which his family and colleagues might well be proud. His capacity for work was immense and it is safe to say that for years he did as much as two ordinary men and none of it slipshod. Actuated by an unswerving devotion to what he considered his duty—to his patients, to his
country, to his students—he gave of his best, reinf
always by a broad humanity, sympathy, and to
for human weakness."

J. L. adds: Anderson and I were first associated
Aberdeen, where I quickly realised that in addition
his skill in diagnosis and in operating he was a man
such simple sincerity, and so devoted to his work,
his relations with his patients were a model of what
should be. For each patient he had a different app
and the care which he took to sum up individuals and
deal with every aspect of their problems made him the
friend and wise counsellor as well as their surgeon;
always thought it a fortunate arrangement that eve
medical student in the university had the opportuni
of seeing at work so able a surgeon, who was also
superb doctor. He had the facility of shedding
unessential, whether at the bedside or in committe
and thus he was a good composer of differences
friendly chuckle, followed by his Buchan "Well, we
so often were the introduction to the outlining o
sensible and practicable course of action, into
discharge of which he almost always succeeded
drawing any who had at first disagreed with him.

During the war, when he was consulting surgeon
the Scottish command, we continued our close associa
in Edinburgh. He did his work for the Army lik
crusader—there was no trouble too great, and no d
too small, for his personal attention. He was a per
consultant: he got on well with everyone, from pri
to general: he had only one object, to do his best for
troops. In his new sphere, the absence of any pers
foible and his sound principles made him particu
welcome when the management of any condition invol
a so-called specialty was concerned. Above all, he
modest.

Those of us who loved and admired him—and
many these were—hoped that his sacrifices durin
war might be at least partly compensated for by a
and happy retirement. Instead, we must fin
epitaph: if the choice were mine it would be "W
Anderson, the good colleague."

Mr. Anderson leaves a widow and three children;
them, Dr. W. Ainslie Anderson and Dr. B. Eileen And
are graduates of medicine.

ANNA JUSTINA AUGUSTA WILSON

F.R.C.P.E., D.M.R.E.

Dr. Justina Wilson, consulting physician to
physiotherapy department of St. Mary's Hospital
on Nov. 28. Before she started her medical traini
was already a physiotherapist of standing and pri
of the Swedish Institute in the Cornwall Road.

From the Royal Free Hospital she took the Sc
triple qualification and the licence of the Soci
Apothecaries in 1916. Later she held clinical ass
ships at the Hospital for Sick Children, Great O
Street, and the National Hospital for Diseases
Heart and she was for a time in charge of the orth
department at the Miller Hospital, Greenwich. Bu
her background it was natural that she should
physical medicine as her specialty, and she was app
medical officer in charge of the electrothera
department at the Royal Free Hospital, later tak
the same position at St. Mary's Hospital. She ob
the D.M.R.E. in 1920; in 1924 she took the M.R
and four years later was elected F.R.C.P.E. Sh
an honorary member of the Chartered Soci
Physiotherapists.

F. M. S. writes: "Justina Wilson came to the
Free Hospital with the reputation of being the f
and director of a school of physiotherapy of a
hospital. She was also older than the rest of us.
two circumstances might have made it diffic
anyone else to adjust themselves to their new sur
ings. But nothing could ever daunt Justina
She was soon the most popular and the youngest
of her year and she took a leading part in every a
academic and social. We were very fond of her
admired the gay courage with which she grapple
the intricacies of a dissection and her diffic
memorising the innumerable facts presented

al student. She was never overbearing with less iced fellow students and we soon forgot that she eader in her own profession. I met her again three decades later. after she had returned to erapeutic work, and she was quite unchanged y, efficient, and always deeply concerned to do to relieve the physical disabilities of the many who sought her advice. Her passing is like the of an institution she is irreplaceable."

JOHN GRIMSHAW

M.D. LOND., D.P.H.

ohn Grimshaw was born at Fleetwood and was at the London Hospital, qualifying in 1891. everal years of general practice in Lancashire, me a civil surgeon at the Cambridge Hospital, ot, and the Herbert Hospital, Woolwich. At e he extended his particular interest and experi- ophthalmology. In 1901 he took the M.D. Lond., 1902 the D.P.H. Camb.

gh he was childless himself, one branch of public that always appealed to him was the medical ation of school-children, and in 1910 he wrote a opular guide, *The Medical Care of the School* Later he became ophthalmic surgeon to the Hospital, Liverpool, and he spent his last years ited general and ophthalmic practice in Birken- hich allowed sufficient leisure for his reading and ng.

markable knowledge of the English language was the most distinguished attribute of this gifted He loved words and had a fine taste in the choice cing of them. He was a clear thinker with high tual qualities, though his uncompromising and dent spirit kept him apart from many people evented him from reaching the position to which ity would have entitled him.

Grimshaw was proud of his profession and devoted patients and friends, who found in him a source of agement and strength; for his character was sound ong. To me he was a father in medicine, a lifelong llor, and a valued collaborator in the preparation ical contributions.

lied on Oct. 11, at the age of 82, some weeks after e, a companion of charming personality.

JOHN PARKINSON.

FRANK THORNTON BIRKINSHAW

M.R.C.S., L.M.S.S.A.

F. T. Birkinshaw, who died at his home in Auckland, ealand, on Oct. 2, was born at Ovingham-on-Tyne 9. From King Edward VI School, Birmingham, nt to the university in that city. In the first war he joined the Royal Warwickshire Regiment was later attached to the Royal Air Force, in he served with a special duty flight attached to edjaz army. For a time he was the personal pilot E. Lawrence, and he was decorated by the French ritish Governments.

1925 he qualified from University College Hospital, e years later he emigrated to New Zealand where actised in Amberley and Christchurch. In 1937 urned to this country for postgraduate study and in a London County Council hospital for eighteen . In 1943 he was appointed superintendent of oromandel Hospital in Christchurch. He gave up post in 1943 to settle in consultant practice in land, where he was also active as a producer in atic circles.

Birkinshaw is survived by his wife, Dr. Edna nshaw, and by a son and daughter.

Appointments

G. E., M.B. Lpool, D.M.R., D.M.R.E.: consultant radiologist, King's Lynn area.

A. A., M.B. St. And., F.R.C.S.E.: consultant ear, nose, and throat surgeon, Peterborough area.

G. S., M.B. St. And.: M.O., Uganda.

Major F., M.B., B.S., D.P.M., barrister-at-law; deputy medical superintendent, Cell Barnes Colony.

* Amended notice.

Notes and News

SMOKE

SPEAKING in London on Nov. 30, Sir George Elliston said that a report recently issued by the Federal Health Authority in Washington on last winter's fatal smoke fog in Donora,[1] when over 20 people died and 40% of the population were made ill, showed that the chief culprit was sulphur dioxide, the corrosive constituent of London fogs. "About the same time, here in London, a week of fog sent up deaths by 20–30% over the average for the previous four weeks, while the number of deaths from bronchitis were more than doubled. . . . It is perfectly certain that if we have a spell that is both dense and persistent, such a rise in mortality will again recur." Two and a half million tons of unburned coal particles are poured each year into the atmosphere, in the form of smoke; and under the conditions of faulty combustion that give rise to smoke there are heat-losses four or five times greater than this in the form of burnable gases—actually crude coal gas—so that altogether the equivalent of 10 million tons of coal or more are wasted yearly as, and with, smoke. "In other words, 2½ weeks' output of the mines each year goes—though it does not vanish!—into thin air." Happily, he continued, the remedies are identical with the programme for using fuel-supplies more efficiently and for improvements in the warming of houses. Even now a revolution is in progress—"a slow, hardly noticeable, and typically British revolution"—so that in fifty years or less the old-fashioned coal fire will be as obsolete as is the open sewer today. Sir George commended the abolition of smoke by stages through the setting up of expanding smokeless zones as preferable to any of the more spectacular methods that might be envisaged.

University of Cambridge

On Nov. 26 the degree of M.D. was conferred on Philip Hugh-Jones.

At a congregation held on Dec. 3 the proposals of the General Board on the new scale of stipends for university teaching officers were approved by 315 votes to 47. Three scales of emoluments are proposed for clinical, preclinical, and non-medical posts. (See *Lancet*, Nov. 19, p. 970.)

Royal College of Physicians of London

On Jan. 10 and 12 Dr. Howard Nicholson will give the Goulstonian lectures on Suppurative Pneumonia. On March 14 and 16 Dr. E. E. Pochin will give the Oliver-Sharpey lectures on the Investigation of Thyroid Function and Disease by the Use of Radioactive Iodine. All the lectures will be held at 5 P.M. in the college, Pall Mall East, S.W.1.

Royal College of Physicians of Ireland

On Dec. 2 the following, who have passed the final examination of the Conjoint Board in Ireland, were admitted to the licentiateship of the college:

Eugene Bradley, P. G. Brady, H. D. Coghlan, Jane J. Connolly, L. A. Cullen, J. C. Dillon, J. A. Doherty, Rita D. Dooley, Elizabeth M. Farrell, J. A. Fitzpatrick, J. B. Gallagher, Rhoda P. Kennedy, M. J. Moran, J. E. Murphy, J. R. Murphy, J. A. McCarthy, Eva T. McDonald, J. F. McGuire, O. A. McKee, Mary T. McQuaid, J. F. Napier, D. O. Ndukwe, Maeve S. O'Kelly, C. M. Ongley, William Quirke, B. F. Regan, Irving Rosenthal, Catherine T. Tynan, Mary T. Vass, A. M. Wells.

Royal College of Surgeons in Ireland

On Dec. 2 the following were admitted to the fellowship: W. G. Fegan, J. H. Johnston, W. R. Lamb.

Royal Society

Prof. E. D. Adrian, O.M., has been elected foreign secretary of the society, and Prof. G. L. Brown, Dr. F. M. R. Walshe, Dr. V. B. Wigglesworth, and Prof. S. Zuckerman members of council.

Scientific Films Census

The information service of the Scientific Film Association is making a national survey of makers, owners, and users of scientific films. Information has been collected already from over 400 film-makers and distributing agencies, but it is believed that there are many more whose names and films are known only to a limited number of people. Details should be sent to the secretary, at 4, Great Russell Street, London, W.C.1.

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[1] See *Lancet*, 1948, ii, 738.

Society for the Study of Addiction

Dr. Erik Jacobsen (Copenhagen) will speak at a meeting of this society on Tuesday, Jan. 10, at 8 P.M., at 1, Wimpole Street, London, W.1, on Biochemical Methods in the Treatment of Alcoholism with special reference to 'Antabuse.'

Oxford Graduates Medical Club

The 100th dinner of this club will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, at 7.30 P.M. on Friday, Jan. 27, when Dr. C. M. Hinds Howell will take the chair. Tickets (price 26s.) may be had from Mr. E. G. Tuckwell, 73, Harley Street, W.1, before Jan. 13.

Plan for W.H.O. Headquarters

The World Health Organisation building committee has tentatively approved a plan by which the organisation will establish its headquarters in the Palais des Nations at Geneva, under a 99-year lease. The plan provides for additional construction at a cost of 3,684,000 Swiss francs; and the offer by the Swiss government of a grant of 3,000,000 francs has been accepted.

Congress of Obstetrics in the U.S.A.

The international and fourth American Congress on Obstetrics and Gynæcology will be held at Hotel Statler, New York, from May 14 to 19, 1950. The English speakers will include Prof. H. L. Sheehan, who will read a paper on the Kidney in Abruptio Placentæ. Further particulars may be had from Dr. Fred L. Adair at 161, East Erie Street, Chicago, 11, Ill.

Claims to Sickness Benefit

In England and Wales new claims to sickness benefit under the National Insurance Act during each of the four weeks ended Nov. 1, 8, 15, and 22 were as follows: 121,900, 135,000, 142,300, and 136,800. These figures are given in the Registrar-General's return for the week ended Nov. 26, which also records the weekly averages for new claims in each month from January to October of this year. These are as follows: 157,800, 180,100, 185,400, 114,400, 97,900, 83,700, 78,500, 88,900, 100,900, and 119,200.

No Health Centre for the Festival

The London County Council's public-health committee has informed the council that it has proved impossible to proceed with the building of the comprehensive health centre which was to have formed part of the "live architecture" exhibition in the Stepney-Poplar reconstruction area for the 1951 Festival of Britain. The Minister of Health was willing to approve the construction of a simple building to accommodate a small group practice; but this suggestion was unacceptable to the committee, and the site is to be reserved until a comprehensive centre can be built.

Anti-histamine Drugs as Cold Cures

The American Medical Association is reported by B.U.P. to have issued a warning against the indiscriminate use of anti-histamine drugs for the prevention and treatment of colds. The association's council on pharmacy and chemistry says that "experience with these drugs is not yet long enough to know whether or not they are harmless when used over long periods of time. Furthermore, the amounts taken during persistent colds may definitely be beyond what has been established as safe." The council is reported as stating that records show that about one-third of those who take these drugs become drowsy or even fall asleep while at work or occasionally even when driving a car.

Nuffield Grants for Research on Cortisone

The Nuffield Foundation have given the University of Oxford a grant of £10,000, payable over three years, for research, to be carried out under the direction of Sir Robert Robinson, P.R.S., into the synthesis of 'Cortisone' and analogous substances.

The foundation have also made a grant to the University of Cambridge of £5000 over three years for work, under Prof. A. R. Todd, F.R.S., on the convenient synthesis of peptides and their application in particular to the adrenocorticotropic hormone problem and on the synthesis of compounds with cortisone activity but simplified structure. A second grant, of £11,000, will be spent on work, under Prof. F. G. Young, F.R.S., on pituitary adrenocorticotropic hormones.

Diary of the Week

DEC. 11-17

Monday, 12th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn
W.C.1
5.30 P.M. Prof. Gosta Dohlman (Lund): Mechanism of
Vestibular Reactions.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. J. F. Brailsford, Dr. H. A. Sisson: Bone Tu

Tuesday, 13th

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. G. B. Dowling: Scleroderma.
CHELSEA CLINICAL SOCIETY
7.30 P.M. (South Kensington Hotel, 47, Queen's Gate T
S.W.7.) Mr. James Laver: Fashions and the F

Wednesday, 14th

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. C. W. McKenny: X-ray Technique.
MIDDLESEX COUNTY MEDICAL SOCIETY
3 P.M. (Ashford Hospital.) Mr. E. N. Callum
Diseases of Egypt.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS (
242, St. Vincent Street
5 P.M. Dr. C. H. Andrewes, F.R.S.: The Common

Thursday, 15th

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, S.W.1
4.30 P.M. Dr. Denis Williams: Neurology lecture-d

Friday, 16th

FACULTY OF RADIOLOGISTS
2.15 P.M. (Royal College of Surgeon's, Lincoln's
W.C.2.) Mr. P. R. Allison, Prof. A. S. Jo
Chest after Thoracic Operation.
MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, W.
5 P.M. Dr. J. W. D. Bull: Radiology clinical d
BIOCHEMICAL SOCIETY
2 P.M. (Guy's Hospital Medical School, S.E.1.)
and demonstration.

Births, Marriages, and Deat

BIRTHS

BAINES.—On Nov. 26, in Birmingham, the wife of Mr
F.R.C.S.—a son.
BEARD.—On Nov. 29, at Nazeing, the wife of Dr.
a daughter.
CONNOLLY.—On Nov. 29, the wife of Mr. Campl
F.R.C.S.—a daughter.
GLOVER.—On Dec. 2, in London, the wife of Dr. E
a daughter.
LUCAS.—On Nov. 30, in London, the wife of Dr. R.
THOMPSON.—On Nov. 30, the wife of Dr. R. E. M.
a son.

MARRIAGE

HIGGINSON—MCKEE.—On Nov. 26, at St. Andrews, Jo
M.R.C.P., to Agnes Gentleman Russell McKee.

DEATHS

ANDERSON.—On Nov. 29, William Anderson, O.B.E
F.R.C.S., F.R.C.S.E.
BIRKINSHAW.—On Oct. 2, Frank Thornton Birkins
aged 50.
CAIRNS.—On Nov. 28, at Wallasey, William Murray
M.D., C.M. Edin., aged 83.
CRUMP.—On Dec. 1, at Malvern, James Arthur Cr
aged 79.
GORDON-MUNN.—On Nov. 29, at Castle Douglas, S
Gordon Gordon-Munn, M.A., M.D., C.M. Edin., F.
GRIMSHAW.—On Oct. 11, at Birkenhead, John Grimsha
D.P.H., aged 82.
HUMPHREY.—On Dec. 1, in London, Leslie Alfre
B.A. Camb., M.B. Lond., M.R.C.P., major, R.A.M.C
KING.—On Nov. 21, at Southampton, Arthur
B.HY. Durh., D.P.H., aged 87.
NODINE.—On Dec. 1, Alonzo Milton Nodine, M.R.C
York.
NUTTALL.—On Nov. 30, at Colwyn Bay, Harold
M.D., aged 79.
SMITH.—On Nov. 29, at Pembury, John Smith, M.B. C
STORK.—On Nov. 27, Ernest Stanley Stork, D.S.O
aged 79.
TRETHOWAN.—On Dec. 1, at Stoke-on-Trent, J
Trethowan, M.R.C.S.
WILSON.—On Nov. 28, in London, Anna Justina Au
F.R.C.P.E.

A concentrate of vitamin B_{12}, obtained by de
tion of the mould streptomyces, is now marke
Laboratories Ltd., as 'Cytamen.'

Dr. J. McK. A. Lowson, principal medical offic
has been awarded the Order of the Crown of Jol

Doctors may now obtain free copies of the
of the *Register of Dietitians* from the Board of
of Medical Auxiliaries, B.M.A. House, Tavis
London, W.C.1.

IC ULCER CASES REVIEWED AFTER TEN YEARS

T OF MEDICAL TREATMENT AND INDICATIONS FOR GASTRECTOMY

URENCE MARTIN
D. Camb., F.R.C.P.
PHYSICIAN

NINIAN LEWIS
M.B. Lond.
MEDICAL REGISTRAR

ADDENBROOKE'S HOSPITAL, CAMBRIDGE

OUGH peptic ulceration is one of the commonest porary diseases, the prognosis at the onset of any ual case is uncertain and the response to medical ent or the need for eventual surgery is unpre- e. The very nature of the disease is a major e to acquiring knowledge of these fundamental . For peptic ulceration, while frequently chronic, ecessarily incapacitating, and hospital treatment e dictated only by the appearance of a major ation.

reatment is common and medical advice may or never be sought. Thus when hospital treatment itial the cases are usually severe or complicated, ild or early ones are seldom admitted. After ion responsibility for the patient is inevitably l between the physician, surgeon, and radiologist, ch contributes his own limited services according umstances. Thus it is exceptional for all those ned with a case to have a comprehensive vista whole course. This fact is reflected in the vast ecialised literature, which tends to divide rather unify our knowledge of peptic ulceration. Papers pically concerned with statistics of incidence. experiments, X-ray findings, surgical techniques hort-term results. the vaunting of ephemeral l cures, and treatments for hæmorrhage. We een unable to discover any series of cases in this y which provides a follow-up survey of ten years, ry few from elsewhere.

sort to surgery for peptic ulceration is generally ed as a failure of medical measures; but the n as to whether medical treatment can in fact ce the natural course of the disease has scarcely considered. It must be admitted that orthodox ent by milk diet and alkalis, and even unorthodox ies, will usually relieve the pain of a relapse. his is not synonymous with healing of the ulcer guarantee against future trouble even though the ent is continued indefinitely. Moreover, the gical healing of an ulcer is still a questionable of the effectiveness of any medical treatment, for nown to take place under the simple influence of admission to hospital. We believe that the only of assessing the worth of any treatment in a fre- ly chronic disease like peptic ulceration is by a long- follow-up survey which will show whether or not atural course has been influenced for the better. sessment of the effectiveness of prolonged medical nt for peptic ulceration is an important matter that one of its main props—the hazard of gastric y—is being steadily knocked away by skilled hands. over, it is becoming more and not less difficult ur present social and economic circumstances for patients to attain such dietary ideals and mental quillity as are said to promote quiescence. Finally, pathetic gratitude of patients at long last relieved by ry emphasises the burden of human misery which have to be borne during the prolonged medical ment of a chronic peptic ulcer.

PRESENT SURVEY

e have followed up, in 1948 and 1949, all the loubted cases of peptic ulceration which were admitted to the medical and surgical wards of Addenbrooke's Hospital during the five years 1934–38 inclusive. There is thus a minimum follow-up period of ten years, and the results should be representative of those from any moderate-sized provincial hospital. Apart from essential surgery dictated by perforation, the majority of patients were treated medically, and the material is thus suitable for the assessment of medical treatment as the prime object.

The criteria adopted for the inclusion of a case in the series were either the unequivocal radiological demonstration of an ulcer crater or its verification at operation or necropsy. There are thus no doubtful cases. These criteria, however, must necessarily have excluded some cases of hæmorrhage from ulcers which had healed by the time that a barium meal could safely be given, and others—particularly duodenal—in which scarring or local tenderness was only presumptive radiological evidence of ulceration.

SURVEY METHODS

A total of 195 cases were traced (vide infra) and the great majority were interviewed and examined at hospital or at their homes. When this was impossible a postal questionnaire was submitted. It was neither necessary nor desirable to submit all cases who attended the hospital to a barium-meal examination, but this was carried out if possible on all cases of doubtful activity and on some which were evidently active and in need of treatment. Thus those which were clinically inactive were not X-rayed and the whole assessment of activity or otherwise was essentially clinical.

Criteria of Activity or Inactivity

A history of characteristic ulcer dyspepsia during the five years before follow-up was held to constitute activity, and the absence of such symptoms was accepted as inactivity. We avoided the word "cure" because experience shows that an ulcer may sometimes recur, or a new one appear, after a longer interval than five years.

Regimen Before Follow-up

Patients were questioned in detail as to whether they had or had not adhered to a regular regimen of alkaline powder and diet since discharge from hospital in 1934–38. As a result, we were able to classify them into three groups—regular regimen, occasional regimen, and none. These details were not available for the patients who were dead or untraced: but, in the former, we knew in many instances whether their ulcers were active at the time of death.

Material

The hospital records for the five-year period of 1934–38 showed a total of 356 inpatient cases of peptic ulcer which fulfilled our criteria. Of these 337 (94·7%) were accounted for as shown in table I.

TABLE I—THE MATERIAL

Type of ulcer	Dead	Traced	Untraced	Total
Gastric	97	123	11	231
Duodenal	35	62	8	105
Gastric — duodenal	10	10	..	20
Total ..	142	195	19	356

In the gastric — duodenal cases the ulcers had been simultaneous or consecutive. Cases of anastomotic ulcer are included under the heading of the primary ulcer.

The *sex ratios* are shown in table II.

TABLE II—SEX RATIOS

Type of ulcer	*Males*	*Females*	*Ratio M : F*
Gastric	178	53	3·4 : 1
Duodenal	92	13	7 : 1
Gastric + duodenal	18	2	9·0 : 1
Total ..	288	68	4·2 : 1

CASES KNOWN TO BE DEAD

Of the 356 cases 142 were known to be dead (table I): 75 died as a direct result of their ulcers (table III), 61 from other causes (table IV), and 6 cases of gastric ulcer from carcinoma of the stomach. For these last the diagnosis was confirmed by necropsy in only 2 and we have no evidence that carcinoma arose from the ulcers previously known to be present.

If we take the 75 patients who died as a direct result of peptic ulcer and the 23 who died from other causes but with active ulcers, we may say that at least 98 (27·5%) of the 356 in the series died with active peptic ulceration within the follow-up period of ten to fourteen years. This figure might be slightly higher if 19 cases had not been untraced.

UNTRACED CASES

In all, 11 gastric and 8 duodenal cases were untraced (8% of the series). Of these, 3 are known to be alive, but some, in view of calculated present ages, are probably dead.

TRACED CASES: *ASSESSMENT OF MEDICAL TREATMENT*

At follow-up there were 123 gastric and 62 duodenal cases who were traced or examined. They had undergone various treatments either while in hospital in 1934–38, before, or afterwards, and were classified as active or inactive (table V) according to whether there was a history of characteristic ulcer dyspepsia during the five years preceding our inquiry. Of the 123 gastric cases 50% were active and 50% inactive (62 and 61 cases); of the 62 duodenal cases 38 (61%) were active, and 24 (39%) inactive.

TABLE III—DEATHS AS DIRECT RESULT OF ULCER

Cause	Gastric	Duodenal	Gastric + duodenal	Total
Hæmorrhage	9	5	1	15
Perforation + operation ..	21	7	2	30
Perforation. No operation	5	2	..	7
After gastrectomy.. ..	6	1	2	9
After gastro-enterostomy..	3	3	..	6
After other operations for ulcer	5	2	1	8
Total	49	20	6	75

For the assessment of medical treatment it was considered fair to include patients who had undergone the simple repair of a perforation, but those who had been subjected to gastro-enterostomy and gastrectomy were excluded. Thus 96 gastric and 43 duodenal cases were available for the assessment of medical treatment and were subdivided according to the dietary regimen which they had followed since 1934–38 (table VI).

This table shows that 42 (44%) of 96 gastric cases and 14 (32·5%) of 43 duodenal cases were inactive at follow-up. It also shows that perseverance with a regular regimen of diet and alkalis by 39% of active gastric and 65·5% of active duodenal cases, and an occasional regimen by 54% of active gastric and 31% of active duodenal had not caused healing of the ulcers. Conversely, *abandonment of treatment* by 55% of inactive and 57% of inactive duodenal cases had not adv affected the progress of healing of the ulcers. results suggest that the continued activity of gastric and duodenal ulcers favoured perseverance the ulcer regimen and that inactivity encouraged aba ment of treatment. This is only human nature or co sense on the part of the patients. Thus we may s that the natural course of the ulcer towards healing chronicity determined perseverance or otherwise treatment and not vice versa.

Subsequent Hæmorrhage and Perforation

To test this hypothesis further we examined effect of regimen upon the occurrence of subseq hæmorrhages and perforations after the patients hospital in 1934–38.

TABLE IV—DEATHS FROM OTHER CAUSES

Type of ulcer	Ulcer active	Ulcer inactive	Activity unknown
Gastric	16	9	17
Duodenal	6	1	8
Gastric + duodenal ..	1	..	3
Total	23	10	28

Taking the active and inactive gastric, and the a and inactive duodenal cases together, we found 13 (14%) of the 96 gastric cases and 11 (25%) of t duodenal cases had sustained subsequent *hæmorr* Of the 13 gastric cases 5 had followed a regular reg and 8 had occasional treatment, and of the 11 duo cases 9 had taken a regular regimen, 1 had occas treatment, and 1 had none. Thus hæmorrhage place in only 1 of those who had abandoned treat Only 2 gastric and 2 duodenal cases perforated, of 1 had taken regular treatment, 2 occasional treat and 1 no treatment.

We cannot say what would have happened if no the cases had taken diet or powder, but it is notew that only 1 hæmorrhage and 1 perforation took among those who had abandoned it. The facts su again that the natural course of the disease was influenced by medical treatment. Those cases which active persevered with their regimen and also suff complications, while those who were inactive aband treatment and had no trouble.

Effect of Length of History on Follow-up Results

It is a matter of common observation that peptic ulcers heal quickly without relapse, some sh tendency to heal over a period of several years, others pursue a relentless course to chronicity. W course will be followed by any one case cannot be pred

TABLE V—RESULTS AT FOLLOW-UP

Treatment	Gastric active	Gastric inactive	Total gastric	Duodenal active	Duodenal inactive
Medical ..	16	30	76	24	12
Medical + suture of perforation ..	8	12	20	5	2
Gastro-enterostomy	4	10	14	6	6
Gastrectomy	4	9	13	3	4
Total	62 (50%)	61 (50%)	123	38 (61%)	24 (39%)

onset and can only be recognised in retrospect. ong-term survey, therefore, it is possible to detect results the influence of ulcers which have different s. Thus, if we classify the cases which were tively active and inactive at follow-up into groups ling to the length of their histories before hospital nent in 1934–38, we find a significantly higher rtion of those with a short history in the inactive (table VII). This finding was also noted by g et al. (1943), Qvigstad and Römcke (1946), almros and Hiertonn (1949).

us for the gastric cases there was a quite significantly greater chance of cases clearing up and being ve ten years later if they had a short rather than g history at the time of admission to hospital in -38. The difference is not so marked in the duodenal but the trend is the same and supports the g for gastric cases.

at this effect was not due to a greater effect of al treatment in cases with a short history is shown le VIII which sets out the regimen followed by active nactive gastric and duodenal cases with long or short ries on admission to hospital in 1934–38.

ble VIII shows the same state of affairs both for ic and duodenal cases. Almost all the cases which active at follow-up had had regular or occasional ment irrespective of the length of their history 1934–38. Conversely about half the number of ive cases, irrespective of length of history, had doned treatment. There is thus additional support ur belief that the natural course of the peptic ulcer the main factor which influenced perseverance or wise with treatment, as well as the patient's state llow-up.

ic + *Duodenal Ulcer Cases*

the 20 gastric + duodenal ulcer cases 10 were dead es III and IV). The remaining 10 cases are too few complicated to allow of detailed analysis, but the ts of medical treatment with or without simple re of a perforation showed the same characteristics he results in cases with gastric or duodenal ulcer e.

TABLE VI—MEDICAL TREATMENT

State at follow-up	Regular regimen	Occasional regimen	None	Total
ic active ..	21 (*39%*)	29 (*54%*)	4 (*7%*)	54
enal active ..	19 (*65·5%*)	9 (*31%*)	1 (*3%*)	29
ic inactive ..	7 (*17%*)	12 (*28 5%*)	23 (*55%*)	42
enal inactive..	5 (*36%*)	1 (*7%*)	8 (*57%*)	14

f 6 cases treated medically (3 of gastro-enterostomy 1 of gastrectomy being excluded) 5 were active at w-up in 4 of which a regular regimen had been wed. The remaining case had become inactive treatment had been abandoned.

clusions Regarding Medical Treatment

n view of the fact that medical treatment only gave the earance of successful results in 42 (44%) of 96 gastric in 14 (32·5%) of 43 duodenal ulcers at follow-up er ten years (table v) we agree with Heuer (1944) t it is unlikely to be successful in more than 50% cases which have to be admitted to hospital. One his main criticisms of it was that it continued too long ore surgical aid was sought; for, like others, he found t the longer medically treated cases are followed the r-e the results become. Thus Natvig et al. (1943), a three-year follow-up of 152 gastric and 230 duodenal er cases treated medically, found that 44% and % respectively were free from symptoms; but when Qvigstad and Römcke (1946) reviewed the same cases again after $6^1/_2$–$9^1/_2$ years only 22% of gastric and 10% of duodenal cases were symptom-free. Similarly Malmros and Hiertonn (1949) recorded successful results from three weeks' medical treatment in 93·5% of 687 peptic ulcer cases; but when the same patients were followed up after 7–10 years only 36·5% of 192 gastric and 29% of 495 duodenal cases showed favourable results, and not all of these were entirely free from ulcer dyspepsia.

TABLE VII—ACTIVITY AT FOLLOW-UP IN RELATION TO LENGTH OF HISTORY BEFORE ADMISSION TO HOSPITAL IN 1934–38

Type of ulcer	Length of history before admission	Active	Inactive	Total
Gastric	2 years or less ..	19	26	45
	More than 2 years ..	35	16	51
	Total.. ..	54	42	96
Duodenal	2 years or less ..	10	7	17
	More than 2 years ..	19	7	26
	Total	29	14	43

For gastric cases, χ^2 exceeds 5 after adjustment for continuity.

From all this evidence and our own results we might well use the same words as Malmros and Hiertonn (1949): "To be perfectly honest the post-investigation presented here is a proof that medicinal ulcer therapy in the accepted form has resulted in almost complete failure." Yet it is remarkable, as we have commented, that the very ability of medical treatment to stay the progress of an ulcer does not seem to have been previously questioned. The reason surely must be that short-term results have been too readily accepted—probably for fear of surgery—and that cases have not been reviewed after a sufficiently long interval. It is undeniable that medical treatment relieves the discomfort of most relapses; but, from our present evidence we cannot believe that it is any protection against further trouble if this is destined by the ulcer.

CRITERIA FOR GASTRECTOMY

We have concluded that medical treatment did not influence the natural course of peptic ulcers in this series, and we now suggest that gastrectomy should be employed in chronic cases more often and earlier. We do not specify gastrectomy as an ideal or infallible cure for chronic peptic ulceration, and for some cases gastro-enterostomy is still the operation of choice. But, with the waning of enthusiasm for vagotomy in duodenal ulcer, gastrectomy remains our best alternative to medical treatment.

TABLE VIII—ACTIVITY AT FOLLOW-UP IN RELATION TO LENGTH OF HISTORY BEFORE ADMISSION TO HOSPITAL IN 1934–38 AND TO REGIMEN AFTER DISCHARGE

Type of ulcer	Length of history before admission	Regular or occasional regimen	No treatment
Gastric	*2 years or less:*		
	Active (19) .. .	95%	5%
	Inactive (26)	42%	58%
	More than 2 years:		
	Active (35)	92%	8%
	Inactive (16)	50%	50%
Duodenal	*2 years or less:*		
	Active (10)	100%	0%
	Inactive (7)	43%	57%
	More than 2 years:		
	Active (19)	95%	5%
	Inactive (7)	43%	57%

TABLE IX—DURATION OF ACTIVITY AT FOLLOW-UP

Duration of activity (yr.)	Gastric active		Gastric inactive		Duodenal active		Duodenal inactive	
1–5	0		15	(55%)	0		2	(50%)
6–9	0		8		0		5	
10–15	23	(42·3%)	13	(31%)	12	(41%)	2	(14%)
16–25	26	(57·5%)	2	(14%)	10	(59%)	3	(36%)
26–30	3		2		3		2	
30 +	2		2		4		0	
Total	54		42		29		14	

It should be recalled that cases were classed as active at follow-up if they had symptoms then or within the previous five years; thus the estimated duration of activity may be slightly too long in some as, for instance, in those whose symptoms had ceased four years previously. Conversely, those classed as inactive had *no symptoms* during the previous five years, and their duration of activity was accurately determined.

The generally accepted indications for gastrectomy are intractable chronicity of an ulcer with or without complications, the risks of further hæmorrhage or perforation, the hazard of malignant change, and as an emergency measure to arrest continuing hæmorrhage. From our present series we cannot comment upon the risk of malignancy beyond noting that 6 (3%) of the 231 gastric cases have so far died from it. Nor have we any cases in which gastrectomy was used to arrest hæmorrhage. Therefore, in suggesting more frequent and earlier gastrectomy, we put forward evidence from this series to show when an ulcer may be finally regarded as chronic, and what were the risks associated with hæmorrhage and perforation in relation to the age of the patient and the duration of ulceration.

CRITERIA OF CHRONICITY

As already stated, a peptic ulcer may either heal within a few years without relapse—even after an initial hæmorrhage or perforation—or it may heal more slowly over a period of several years, or steadily become chronic. Because the course which an ulcer will take cannot be predicted at the onset our problem is to determine how soon chronicity may be assumed and the question of gastrectomy be considered. It is as important not to advise gastrectomy for an ulcer which may still heal as it is to advise gastrectomy when chronicity is established. In table IX we show the calculated duration of activity of all the medically treated cases of gastric and duodenal ulcer which were available for follow-up (96 gastric and 43 duodenal, as in table VI). Cases treated by elective surgery are excluded because their duration of activity had been artificially terminated, and also the cases which were dead or untraced, because the exact duration of activity was unknown in many.

TABLE X—DURATION OF ACTIVITY IN GASTRIC AND DUODENAL CASES

Duration of activity	% of gastric (active + inactive) (96)	% of duodenal (active + inactive) (13)
Less than 10 years	24	16
10–15 years	37·5	33
More than 15 years.. ..	38·5	51

Thus no active gastric or duodenal cases had, at follow-up, a duration of activity of less than five or ten years; whereas 55% of the inactive gastric and 50% of inactive duodenal cases fell into these groups. At the other end of the scale the opposite conditions were observed, in that 57·5% of active gastric and 59% of active duodenal cases had a duration of activity exceeding fifteen years, as compared with 14% of inactive gastric and 36% of inactive duodenal cases. Intermediate between the two, with a duration of ten to fifteen years, were 42·5% of active gastric, 41% of duodenal, 31% of inactive gastric, and 14% of duodenal cases.

The analysis thus provides evidence of the three of peptic ulcer with different courses, together arbitrary standards for their retrospective according to duration of activity. It is that there is no significant difference in the prop of the three types in the gastric and duodenal when active and inactive cases are taken (table X).

We may thus suggest that a peptic ulcer which inactive within five or ten years will probably so, but if activity is prolonged to fifteen years the are 2 or 3 to 1 against healing, and beyond fifteen an ulcer almost certainly will not heal. We therefore, that gastrectomy ought to be all peptic ulcers of ten years' duration, from point onwards the chances of healing rapidly diminish

THE RISKS OF HÆMORRHAGE

By hæmorrhage we mean a melæna or hæmatem which was sufficient to alarm the patient or necess admission to hospital. Table XI summarises the m statistics, which do not differ significantly for all gas and duodenal cases in the series.

TABLE XI—*HÆMORRHAGE*

—	Gastric cases (231)	Duoden cases (10
Cases of hæmorrhage	62 (*26·8%*)	37 (35 3
Cases which bled more than once..	15 (*6·4%*)	11 (*10 4*
Deaths from hæmorrhage	9 (*3·89%*)	5 (4 7%
Chance of bleeding	1 in 3·7	1 in 2
Chance of bleeding more than once	*1 in 15·4*	1 in 9 5
Chance of death from hæmorrhage	1 in 25·6	1 in 21

The mortality from hæmorrhage among those bled was 14·5% for gastric and 13·5% for duode cases. Curiously enough only *1* of 26 patients bled more than once died of hæmorrhage—a duode case from the fourth hæmorrhage after 24 years' activ The incidence of hæmorrhage in this series agrees the estimate of 30% for all gastric and duodenal ul made by Hurst and Ryle (1937).

Hæmorrhage in Relation to Age

Table XII shows in groups the ages of 62 gastric 37 duodenal cases who bled; 26 cases bled more once and their ages at the last hæmorrhage have taken.

Thus the great majority of hæmorrhages (83·5% gastric and 81% of duodenal) took place between ages of forty and seventy, with approximately eq frequency in each of the three decades. The incide rose with age to a *maximum* about fifty years,

TABLE XII—HÆMORRHAGE IN RELATION TO AGE

Age at hæmorrhage (yr.)	Gastric cases (62)		Duodenal cases (37)		Gastric deaths (9)	Du den deat (5
20–29	1 (*1·5%*)		1 (*3%*)		0	0
30–39	6 (*10%*)		5 (*13%*)		0	1
40–49	15 (*24%*)	*83·5%*	10 (*27%*)	*81%*	0	1
50–59	21 (*34%*)		9 (*24%*)		4	0
60–69	16 (*25·5%*)		11 (*30%*)		4	3
70–79	3 (*5%*)		1 (*3%*)		1	0

E XIII—HÆMORRHAGE IN RELATION TO DURATION OF ULCERATION

	Gastric cases (62)	Duodenal cases (37)	Gastric deaths (9)	Duodenal deaths (5)
	20 (*32%*)	12 (*32·5%*)	3	2
	7 (*11·5%*)	3 (*8%*)	2	0
	35 (*56·5%*)	22 (*59·5%*)	4	3

ed by Lewin and Truelove (1949) and Avery (1947) in large series of cases. The 9 gastric ts who died of hæmorrhage were all over fifty of age and of the 5 fatal duodenal cases 2 were fifty and 3 over sixty, thus showing the well-ised predominance of mortality in elderly patients.

rrhage in Relation to Duration of Ulceration

able XIII the cases of gastric and duodenal hæmor-are arranged according to the times after onset eration at which bleeding took place. As before ve taken the last hæmorrhage for those who bled l times.

s table shows clearly that nearly 60% of both c and duodenal hæmorrhages took place after ten activity or more with a similar proportion of the s. It also shows a not inconsiderable incidence) of hæmorrhage, and deaths from it, in gastric and nal cases within five years of onset.

may summarise the situation regarding ulcer rrhage in this series by saying that the chance of rrhage was about 1 in 3 for all gastric and duodenal and the chance of dying from it was 1 in 20 to 25. bleeding took place it did so in 80–85% of cases en the ages of forty and seventy with equal fre-y in the three decades, and in about 60% of cases ten years or more of activity. The mortality was ntrated in the patients over fifty.

THE RISKS OF PERFORATION

ble XIV shows the main statistics for perforation of ic and duodenal ulcers.

e mortality from perforation among those who ined it was 33% for gastric and 43·5% for duodenal

TABLE XIV—PERFORATION

	Gastric cases (231)	Duodenal cases (105)
of perforation	78 (*34%*)	23 (*22%*)
who perforated twice	7 (*3%*)	1 (*1%*)
s from perforation	26 (*11%*)	10 (*9 5%*)
e of perforation..	1 in 3	1 in 4
e of death from perforation ..	1 in 9	1 in 10·5

. Since 5 gastric and 2 duodenal cases died without tions and 7 gastric and 1 duodenal case perforated , the operative mortality after perforation was 26% astric and 36% for duodenal cases. Having regard e respective numbers of perforations and totals of , we can say that there is no significant difference he statistics for gastric and duodenal perforation. perhaps of interest to note that whereas the chance erforation of an ulcer was about the same as that for morrhage, the chance of dying from perforation was e as great (tables XII and XIV).

foration in Relation to Age

n table XV the cases of gastric and duodenal perfora-n are arranged in age-groups; the age at the second foration has been taken for those who perforated ice.

This shows some difference between the relation of age to the occurrence of perforation in gastric and duodenal ulcers. In gastric cases the frequency was similar to that of hæmorrhage—namely, an increase with age so that 80% of perforations took place between the ages of forty and seventy with a maximum incidence (36%) in the sixth decade. In duodenal cases, however, the incidence was spread more evenly over the age-period of thirty to seventy years with maximum values (26·5%) in the fourth and seventh decades. Nevertheless 60·5% of perforations took place between the ages of forty and seventy.

Perforation in Relation to Duration of Ulceration

Table XVI shows the times after onset of ulceration at which perforations took place; in those who perforated twice the time of the second is taken.

This table shows clearly an equal incidence (about 45–50%) of perforations within five years of onset or after ten years both for gastric and duodenal cases. 11 of 26 gastric and 5 of 10 duodenal deaths from perforation took place in cases with ten or more years' activity; but 14 gastric and 5 duodenal deaths also took place within five years of onset, a finding partially due to perforation of acute ulcers.

TABLE XV—PERFORATION IN RELATION TO AGE

Ages at perforation (yr.)	Gastric cases (78)		Duodenal cases (23)		Gastric deaths (26)	Duodenal deaths (10)
20–29	5 (*6%*)		2 (9%)		0	1
30–39	7 (*9%*)		6 (*26·5%*)		1	3
40–49	13 (*17%*)	*80%*	4 (*17%*)	*60%*	0	1
50–59	28 (*36%*)		4 (*17%*)		11	1
60–69	21 (*27%*)		6 (*26·5%*)		13	3
70–79	4 (*5%*)		1 (*4%*)		1	1

We may conclude, then, that with a 1 in 3 chance of perforation for all gastric and duodenal cases (table XIV) it was equally likely to take place within five years of onset or after ten years, with only a small incidence in the intervening years. The age-incidence differed somewhat for gastric and duodenal cases in that 80% of gastric perforations occurred between the ages of forty and seventy years as compared with 60·5% of duodenal perforations. This suggests that duodenal ulcers tend to perforate earlier in life than gastric ulcers, and, because the proportions of perforations which occurred at the various time-intervals after onset were the same for both classes, we may deduce that the duodenal ulcers which perforated started at an earlier age than the gastric. This deduction is confirmed by the finding that 56·5% of the duodenal patients who perforated were under the age of forty at onset, as compared with 34·5% of gastric cases.

Having shown that a peptic ulcer should be regarded as probably chronic after ten years' duration, our suggestion that gastrectomy should then be seriously considered receives support from the analyses of hæmorrhage and perforation. About 55% of all hæmorrhages

TABLE XVI—PERFORATION IN RELATION TO DURATION OF ULCERATION

Years after onset	Gastric cases (78)	Duodenal cases (23)	Gastric deaths (26)	Duodenal deaths (10)
1–5	36 (*46%*)	12 (*52%*)	14	5
6–9	4 (*5%*)	1 (*4%*)	1	0
10 +	33 (*49%*)	10 (*44%*)	11	5

and 45% *of perforations in this series took place in cases* with a history of ten years' or more activity, and these included 7 deaths from bleeding and 16 from perforation. These figures alone, which do not reflect all the invalidism in uncomplicated cases, are sufficient to show the saving in lives and ill health which could have been effected by gastrectomy after ten years' duration at an early stage of chronicity. We must, of course, accept the risks from hæmorrhage and perforation early in the disease before chronicity is established; they are likely to carry a lower mortality today than they did in this series, but they are still significant.

Gastrectomy clearly should not be advised if a reasonable chance remains of an ulcer healing naturally, for the operation is severe, even at the hands of an expert. To Strode's (1948) provocative question "Why treat gastric ulcers medically?" we reply that about 30% *of the 231 gastric ulcers in this series healed without* surgical treatment; if he had specified chronic gastric ulcers we should have had no answer. We cannot discuss the mortality from gastrectomy except in the most general terms for the age and condition of the patient, the skill of the surgeon and anæsthetist, and the standard of preoperative and postoperative care are all variables. Nevertheless it may be said that the mortality in expert hands with the best ancillary facilities is probably less than 5%; but over the country as a whole it may be nearer 15%, and it rises with age.

The age and condition of the patient is certainly a major factor. A surgeon, however expert, cannot expect the same freedom from postoperative complications in elderly patients enfeebled by age and years of peptic ulceration that he can in younger subjects in relatively good condition. From our own observations we would *suggest that gastrectomy carries its lowest risks under* the age of fifty but thereafter they increase with age and become formidable over sixty-five. We have noted that in Hosford's (1949) series of 200 gastrectomies with 1 death, performed for peptic ulcer between 1936 and 1947, the average age of the patients was under fifty years. In Hedley Visick's (1948) series of 505 gastrectomies during the same period the total mortality was 5%; but it rose from 0·8% in the third decade to 5% in the fourth, 5·8% in the fifth, and 7·1% in the sixth or later.

It is evident, therefore, that the age of the patient should be reckoned with in conjunction with the duration of the ulcer when gastrectomy is considered. However, against the risk of postoperative death must be set the risk of death from complications of the ulcer if gastrectomy is not performed. Lewin and Truelove (1949) showed that the mortality from gastroduodenal hæmorrhage was profoundly influenced by the age of the patients and scarcely at all by the length of ulcer history. Thus in their series the fatality-rate did not exceed 10% in patients under fifty whatever their length of history, whereas it was not less than 22% for cases over fifty at any stage of the disease. We have not sufficient cases in this series to put forward similar statistics but the trend is the same. Thus in some cases it may be apparent that the risk of death from hæmorrhage or perforation may be greater than that of gastrectomy at a particular age.

Each case must be judged on individual circumstances, but in general we advocate gastrectomy for peptic ulcers after ten years' duration or, whenever possible, by the age of fifty. If this were done the invalidism, complications, and deaths from chronic peptic ulceration would be greatly diminished.

SUMMARY

The 356 cases of peptic ulcer, admitted as inpatients to Addenbrooke's Hospital during the years 1934–38 inclusive, have been reviewed in 1948–49.

Of this total 337 cases were accounted for or examined.

Medical treatment did not appear to have
the natural course of the disease.

Criteria for estimation of chronicity and
for hæmorrhage and perforation are given.

Gastrectomy is urged for all peptic ulcers
or more years' duration, preferably before the age

We are glad to acknowledge our indebtedness to P
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PENICILLIN-RESISTANT STAPHYLOCOCCAL INFECTION I MATERNITY HOSPITAL

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IN *the course of routine bacteriological* exami
material from a maternity hospital it became
only that there was a high incidence of staph
infection among the infants in this hospital
that nearly all the infections were with
resistant strains of staphylococci.

In an attempt to trace the source of infe
carrier state of the staff of the hospital was
This led to the rather alarming discovery that
the staff were carrying *Staph. pyogenes,* and tha
the carriers were carrying penicillin-resistant str
was therefore decided to study staphylococcal
in this hospital in relation to the carrier stat
staff for a considerable length of time, and to
incidence of infection could be reduced by in
the aseptic technique used in the hospital. We re
the results of our investigations over eight mo

METHODS

All swabs from infective processes were plated out
blood-agar plates and penicillin ditch-plates. Th
this investigation the latter were made from 'Lem
plates, and the ditch, cut at one side of the plate,
with the same medium containing about 10 units of
per ml. They were prepared twenty-four hours or mo
use to allow some penicillin to diffuse out of the di
Oxford staphylococcus was streaked across every di
at the time of use as a control.

If staphylococci were present next day they we
for coagulase by the slide method of Cadness-Gra
(1943). Cultures of coagulase-positive staphylococci
referred to as *Staph. pyogenes*) were examined for
sensitivity. If, in such cultures, the ditch-plates s
colonies more resistant to penicillin than the Oxford
coccus, a single colony was picked from the blood-a
and streaked across a further ditch-plate to see w
mixture of penicillin-sensitive and penicillin-resistant
could be detected. *If all* colonies from a single
showed a similar reaction to penicillin, one was p
into lemco broth for further investigation. If both
sensitive and penicillin-resistant strains were presen
each was similarly picked off.

TABLE I—MONTHLY INCIDENCE OF INFECTIONS IN BABIES AND MOTHERS

Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept. 1–20
ths	116	100	117	108	112	114	125	98	60
abies becoming infected	12 (*10·3%*)	22 (*22%*)	13 (*11%*)	19 (*17%*)	16 (*14·5%*)	16 (*14·2%*)	19 (*15·2%*)	8 (*8·2%*)	8 (*13·3%*)
others becoming infected	..	..	2	6	3	5	2	1	..

er State among Staff of Hospital.—The carrier state ntially pathogenic staphylococci in the hospital was ated by examining swabs from the anterior nares and the back of the wrist of the medical, nursing, and ic staff, and from the conjunctivæ of healthy babies. skin in every case, and the anterior nares in most moistened swabs were used. All these swabs were directly on to plain agar plates, which were incubated ht, and those from the skin and conjunctivæ were also ed in broth, which after overnight incubation was out. Where staphylococci were present they were ed by the slide coagulase test, and strains giving a e reaction were regarded as presumptive pathogens. ains, however, were later tested for α-hæmolysin (see : Where coagulase-positive staphylococci were present, er of colonies, if possible 10, were tested for penicillin ity by streaking across penicillin ditch-plates. If coagulase-positive staphylococci were present on the y plate, the growth was emulsified in broth and plated a similar ditch-plate to detect small numbers of peni- esistant staphylococci which might otherwise have been . Representative penicillin-sensitive and penicillin- nt colonies from each swab were picked off into lemco for further investigation.

TABLE II—TYPES OF INFECTION

Babies	*No. of cases*
al conjunctivitis, styes, and blepharitis	87
cial pyogenic skin lesions (furuncles, pustules, c spots)	29
s of infants	9
chia	5
itis	1
tis	2
Total	133
Mothers	
mastitis and breast abscess	16
ses and furuncles of skin	3
Total	19

rier State among Staff of London Store.—It was thought ble to compare the nasal carrier state of potentially genic staphylococci among hospital nurses with that of up of women living and working under the same roof ot connected with a hospital. Nasal swabs were therefore ned from 62 women working at a large London tment store and living in the attached hostel.

ha-hæmolysin.—All strains were tested for α-hæmolysin ction by the method of Gillespie and Simpson (1948), trains giving doubtful or negative results by this method further tested by the technique described by McFarlan).

ree and Type of Resistance to Penicillin.—All penicillin- nt strains from infective processes and 15 from carriers tested for penicillinase by the method of Barber (1947). strains were tested for penicillin sensitivity by serial ion in broth, two different sized inocula being used in case, as recommended by Gilson and Parker (1948). An mpt was made to determine the capacity of the same five ins to destroy penicillin. Equal portions of eighteen-hour ures were mixed separately with the same quantity of icillin solutions containing 500, 250, 100, and 50 units ml. The mixtures were incubated for an hour at 37°C then tested for penicillin content by the cylinder-plate hod.

ulphathiazole and Streptomycin Sensitivity.—All but one he strains from infective processes were tested for sensitivity ulphathiazole and streptomycin, and 22 strains from 18 riers were also tested for sensitivity to the former. Both ts were done on ditch-plates. For the former they were made of laked horse blood-agar as recommended by Harper and Cawston (1945), the ditch containing 1 in 5000 sulphathiazole, and for the latter ditches were cut in lemco agar plates containing 1000 µg. of streptomycin per ml. In both cases part of every ditch-plate was seeded with the Oxford staphylococcus as a control.

Phage-typing.—All strains were phage-typed by the method used at the Central Public Health Laboratory and with the same 25 filtrates. The method is based on the work of Wilson and Atkinson (1945).

INCIDENCE AND TYPE OF INFECTION

From the beginning of 1949 until the middle of September, when this investigation was concluded, there had been 950 births in the maternity unit under study. Of these 950 babies 133 developed neonatal conjunctivitis, superficial pyogenic skin lesions, or other probably staphylococcal infections. During this period 19 mothers were diagnosed as having mastitis, breast abscess, or furunculosis. The distribution of these infections throughout the period surveyed is given in table I, from which it is clear that, except for the rather high incidence of infection in February and the rather low one in August, the infection-rate has remained fairly constant for nine months.

The type of infection diagnosed clinically is listed in table II, which reveals the predominance of conjunctival and minor skin lesions in babies, and the absence of pemphigus neonatorum. In most of the cases the infection was very mild. Five, however, were sufficiently severe to require extensive treatment, and in these the patients were transferred to a pædiatric hospital. There were no deaths in the series, and no cases of permanent disablement.

STRAINS OF *Staph. pyogenes* ISOLATED FROM INFECTIVE PROCESSES

Swabs were examined from 56 cases of infection, and the results are given in table III. The only pathogen isolated from any of the specimens was *Staph. pyogenes*, and this organism was isolated from 42, in most cases in pure culture. The remaining 14 swabs were either sterile or yielded non-pathogenic organisms only. Many of these negative swabs came from patients under treat-

TABLE III—INCIDENCE AND PHAGE-TYPES OF *Staph. pyogenes* IN CASES OF INFECTION EXAMINED BETWEEN FEB. 22 AND AUG. 9, 1949

No. examined	*Staph. pyogenes* isolated			
	Total	Penicillin-resistant colonies only	Penicillin-sensitive colonies only	Penicillin-sensitive and penicillin-resistant
56	42	36	3	3

Phage-types of the 45 strains isolated

Phage-types	Total	Penicillin-resistant	Penicillin-sensitive
52A	26	23	3
N.T.	16	14	2
29Gp.	2	1	1
47Gp.	1	1	..

N.T., non-typable.

TABLE IV—INCIDENCE AND PHAGE-TYPES OF *Staph. pyogenes* IN CONJUNCTIVÆ OF HEALTHY BABIES EXAMINED ON FEB. 24, 1949

No. examined	*Staph. pyogenes* isolated			
	Total	Penicillin-resistant colonies only	Penicillin-sensitive colonies only	Penicillin-sensitive and penicillin-resistant
35	19	15	3	1

Phage-types of the 20 strains isolated

Phage-types	Total	Penicillin-resistant	Penicillin-sensitive
52A	10	9	1
N.T.	8	6	2
7/42/44/52A +	2	1	1

N.T., non-typable.

ment. In 36 of the 42 cultures of *Staph. pyogenes* all colonies tested were resistant to penicillin, whereas in only 3 cases were all colonies as sensitive to penicillin as the Oxford [illegible] patients both penicillin-sensiti[illegible] colonies were isolated. Thus on the basis of their reaction to penicillin 45 strains of *Staph. pyogenes* were isolated from 42 patients.

The degree of resistance to penicillin was in every case such that, when a single colony of a resistant strain was streaked across a penicillin ditch-plate, growth took place at least to the edge of the ditch and usually right across it. All the penicillin-resistant strains produced penicillinase. An attempt was made to measure the degree of resistance to penicillin of 5 of the resistant strains more accurately by serial dilution in broth. Two inocula of different sizes were used, since it is now well recognised (Luria 1946, Barber 1947) that the degree of resistance of penicillin-destroying strains when measured in the laboratory may vary many hundredfold according to the size of inoculum used. It was found that when the inoculum was about 1000 organisms, all 5 strains were inhibited by 0·5 unit of penicillin or less per ml., but, when the inoculum was 1,000,000 organisms or more, all 5 strains grew in at least 50 units of penicillin per ml. When young cultures of the same 5 strains were mixed with an equal quantity of a penicillin solution and the mixtures incubated at 37°C, they all destroyed about 250 units of penicillin in an hour.

All 45 strains of *Staph. pyogenes* were phage-typed. It will be seen from table III that 16 were not typable with the available filtrates. Of the 29 typable strains 26, consisting of 23 penicillin-resistant and 3 penicillin-sensitive strains, were phage-type 52A.

Of 44 strains tested for sensitivity to sulphathiazole, 42 had a sensitivity similar to that of the Oxford staphylococcus, but 2 strains were considerably more resistant. The same 44 strains were tested for sensitivity to streptomycin, and all showed a sensitivity similar to that of the Oxford staphylococcus.

All 45 strains were shown to produce α-toxin.

CARRIER STATE AMONG PATIENTS

At the beginning of the investigation conjunctival swabs were taken from all the babies at that time in the hospital who were free from infection. The results are given in table IV, which shows that *Staph. pyogenes* was isolated from 19 of the 35 babies examined. In 15 cases all colonies tested were resistant to penicillin, and in 1 both penicillin-sensitive and penicillin-resistant colonies were isolated. Thus from only 3 of the specimens yielding *Staph. pyogenes* were all colonies tested penicillin-sensitive.

As with the strains from infective processes, the predominant phage-type was 52A. As shown in table IV,
it was possible to type 12 of the 20 strains by
phage-method, and 10 of these 12 were type 52A.

In view of the work of Allison and Hobbs (
was thought unlikely that infants became infe
their mothers. The nasal carrier state of the
was not, therefore, investigated. Nasal and skin
were, however, taken from 6 mothers, all of whom
infected infants. All 6 carried *Staph. pyogenes*:
the nose and on the skin, 3 on the skin only, and 1
nose only. Three yielded only penicillin-resistant
2 of these were phage-type 52A and 1 non-typable.
other 3 were carrying penicillin-sensitive strains
1 of these was phage-type 3C, and the other
non-typable.

Of the 28 strains isolated from healthy babie
mothers 6 were non-toxigenic.

CARRIER STATE AMONG NURSES AND DOCTORS OF HO

The carrier state among the nurses and
doctors of the hospital was investigated on three
occasions. The carrier rates of *Staph. pyogenes*
penicillin-resistant *strains* on all three occasio
given in table v. The phage-types of the strains i
are shown in table VI. Since the hospital is a t
school for midwives, though the number of nurse
at any one time in the hospital remains about the
the staff is continually changing. About 12 of the
are permanent members of the staff, but new
midwives arrive in batches of 10–20 each mon
remain for three months. The carriers recor
table v do not therefore represent the same nu
each occasion. Only 8 nurses were examined on a
occasions; 32 were swabbed on the first two da
22 on the last two.

At the first examination, on Feb. 22, 64 mem
the staff (62 nurses and 2 medical officers) were s
Staph. pyogenes was isolated from the nose of
from the skin of the back of the wrist of 32. Most
skin carriers were also nasal carriers, but 4 we
Thus the total number carrying *Staph. pyogenes* on
site was 48 (75%). Penicillin-resistant strains
isolated from 40 of the 48 carriers. From 25 of
cultures only penicillin-resistant strains were is
but 15 yielded both penicillin-resistant and pen
sensitive strains.

At the next investigation, on May 17, swabs were
from 61 of the staff (60 nurses and 1 medical officer
nasal carrier-rate was similar to that on Feb. 22,
pyogenes being isolated from 40 swabs, but only 1
found to be skin carriers. The total number of carr
either site was 41 (67·2%); 35 of these yielded pen

TABLE V—CARRIER STATE AMONG NURSES AND DOCTOR
SIX MONTHS

Date of examination	No. examined	Carriers of *Staph. pyogenes*				
		Site of carriage	Total		Carr peni re str	
			No.	% of staff	No	
Feb. 22, 1949	64	Nose	41	68·75	36	
	62	Skin	32	51·6	22	
	64	Total (nose or skin):	48	75·0	40	
May 17, 1949	61	Nose	40	65·6	31	
	61	Skin	12	19·7	9	
	61	Total (nose or skin):	41	67·2	35	
Aug. 9, 1949	48	Nose	27	56·25	19	
	48	Skin	5	10·4	3	
	48	Total (nose or skin):	28	58·3	20	

it strains, in 26 cases alone and in 9 cases in tion with penicillin-sensitive strains.

lug. 9 owing to holidays only 48 of the staff (46 and 2 doctors) were available for examination. *pyogenes* was isolated from the nose of 27, but he skin of only 5. The total number carrying *pyogenes* on either site was 28 (58·3%). From 20 e carriers penicillin-resistant strains were isolated, cases alone and in 4 cases in association with lin-sensitive strains.

ill be seen from table VI that the predominant type among the strains isolated was on all three ns 52A, the same type that predominated among rains isolated from infants. Of the penicillin-nt organisms all but 4 of the typable strains on t occasion and all the typable strains at the last aminations were of this type. The penicillin-ve strains showed less uniformity, but of the e strains 7 of 16 in the first series, 7 of 11 in the , and 3 of 5 in the third were type 52A.

VI—PHAGE-TYPES OF STRAINS ISOLATED FROM NURSES AND DOCTORS

	No of carriers	No. of strains	Phage-type	Penicillin-resistant	Penicillin-sensitive
2,	48	67	52A	20	7
			N.T.	18	9
			6/47 Gp.	3	1
			Other groups	1	8
4,	41	51	52A	22	7
			N.T.	14	6
			6/47 Gp.	0	0
			Other groups	0	2
),	28	32	52A	15	3
			N.T.	6	6
			6/47 Gp.	0	0
			Other groups	0	2

N.T., non-typable.

ill thus be seen that in spite of an almost complete e in the personnel making up the staff (40 of the abbed on Aug. 9 had entered the hospital since 22) the nasal carrier state in the hospital emained remarkably constant for six months. ghout the period penicillin-resistant organisms ge-type 52A have predominated.

table VII the nasal carrier state among the nurses is d to time of entry. This shows that the proportion ses carrying penicillin-resistant strains rises steadily length of stay in the hospital. Thus, of the nurses ed on the *first or second day after arrival less than* were carrying penicillin resistant strains of *Staph.* *es*, whereas nearly half of those who were swabbed six weeks in the hospital yielded such organisms. mong the nurses who had been in the hospital for months or more the proportion had risen to 66%. ing to the short stay of pupil midwives in the tal the nurses swabbed at the different times were not the same persons; 14 nurses, however, were d on the day of entry and again fourteen days On the day of entry penicillin-resistant strains of *pyogenes* were isolated from only 3, whereas after een days in the hospital these 3 and 5 others, making tal of 8, were carrying such organisms.

lphonamide sensitivity was tested in 22 strains ted from 18 nurses on Feb. 22; 19 showed a sensi-y to sulphathiazole similar to that of the Oxford hylococcus; 3 were considerably more resistant. the total 150 carrier strains isolated on the three ions 10 were non-toxigenic.

STUDY OF 10 HEAVY CARRIERS AMONG NURSES

nalysis of the swabs taken on Feb. 22 showed that y of the heaviest growths of potentially pathogenic phylococci ca[illegible] permanent nurses of the

TABLE VII—NASAL CARRIER STATE AMONG NURSES RELATED TO TIME SINCE ENTRY TO HOSPITAL

Time since entry	No. examined	Nasal carriers of *Staph. pyogenes*	
		Total	No. carrying penicillin-resistant strains
1–2 days	23	7	4
8–14 ,, ...	27	10	8
6 weeks	24	14	11
3 months or over ..	46	37	31

The nurses examined at different times were not always the same persons.

hospital. It was therefore decided to study the constancy of the carrier state in 10 such nurses. Starting on March 20, further nasal swabs were taken from these 10 nurses on three occasions at weekly intervals. Immediately after being swabbed on March 20, 5 of the nurses were given sulphathiazole cream, which they were asked to smear inside the anterior nares daily for four days. When the second swab was taken, three days after *stopping sulphathiazole treatment, 2 of the 5 treated* carriers had become negative and 2 showed a considerable reduction in carriage of *Staph. pyogenes*. The effect, however, was temporary, and by the following week *Staph. pyogenes* was again isolated in large numbers.

Of the 10 carriers studied in this group 9 had yielded penicillin-resistant strains of *Staph. pyogenes* of phage-type 52A on Feb. 22. From 6 this was the only strain isolated; 2 also yielded a penicillin-sensitive strain of the same phage-type, and 1 yielded a non-typable penicillin-sensitive strain. The remaining nurse carried a penicillin-sensitive strain belonging to phage-type 7/42E/44/52A. Apart from the temporary effect of sulphathiazole the staphylococcal carrier state in all these nurses remained almost unchanged. In 7 it remained entirely constant; 2 nurses originally carrying two strains appeared to lose one of the two, and 1 nurse yielding a single strain of penicillin-resistant phage-type 52A on Feb. 22 also yielded a penicillin-sensitive strain of phage-type 47C/52 on subsequent occasions.

Of these nurses 9 were swabbed again on May 17 or on Aug. 9 or on both dates; 2, who had been on holiday on May 17, had become negative on Aug. 9; the other 7 were still carrying strains similar to those isolated from them previously.

CARRIER STATE AMONG HOSPITAL DOMESTICS

On Feb. 22 nasal and skin swabs were taken from 17 of the hospital domestics. The group included ward cleaners and kitchen and laundry staff. The results are

TABLE VIII—CARRIER STATE AMONG DOMESTIC STAFF OF HOSPITAL

Date of examination	No. examined	Site of carriage	Carriers of *Staph. pyogenes*	
			Total	No. carrying penicillin-resistant strains
Feb. 22, 1949	17	Nose	9	2
	17	Skin	9	0
	17	Total (nose or skin):	12	2

Phage-types of strains isolated

No. of carriers	No. of strains	Phage-type	Penicillin-resistant	Penicillin-sensitive
12	16	52A	0	2
		N.T.	2	8
		Other groups	0	4

N.T., non-typable.

given in table VIII. It will at once be seen that the carrier state among the domestics is quite different from that among the nurses. Though *Staph. pyogenes* was isolated from the nose or skin of 12 of the domestics, only 2 yielded penicillin-resistant strains, both of which were non-typable. Only 2 of the 16 strains isolated belonged to phage-type 52A, and both of these were penicillin-sensitive.

All but 2 of the 16 strains carried by the domestic staff were α-toxigenic.

ASEPTIC TECHNIQUE

The main rules used to control the spread of infection in practice in the hospital at the beginning of this investigation were as follows:

Not more than 4 nurses handle any one baby between the time of delivery and the day of discharge.

Nurses and doctors, and cleaners when in the nursery, invariably wear masks which cover mouth and nose, and all nurses wear gowns.

Babies are washed in their cots and have separate towels.

Sterile cotton-wool is used during bathing. There is no communal changing table. Baths are disinfected with 'Dettol' after use.

Mothers are masked when they handle and feed their babies.

Feeding utensils are boiled after use.

Infected babies are immediately isolated in a small ward, and their attendants scrub up before and after handling them, and wear fresh gowns and masks, which are changed on leaving.

When each baby leaves, its blankets are laundered if the child has been healthy. If there has been any clinical infection, the complete bedding is autoclaved.

Ward floors throughout the hospital are swept with 'Di-dust,' a preparation resembling oily sawdust, which is intended to prevent dust particles from scattering. Babies are never in any ward which is being swept.

These measures are emphasised repeatedly to junior staff, and there is little doubt that they are fairly closely adhered to; but, since many of them depend on painstaking coöperation, and since constant close supervision is not always possible it seems likely that there are occasional examples of negligence.

These precautions seemed to us to compare favourably with those adopted in other maternity hospitals, but many possible sources of infection remain. When the carrier state of the nurses was discovered on Feb. 22, the hospital technique was discussed with one of the resident medical officers, and the following extra measures were recommended:

Masks should be changed more often, and any nurse blowing her nose should wash her hands and change her mask.

Nurses should wash up as if for a surgical operation before and after handling all babies, whether infected or not.

Nurses should all wear over their uniforms while on duty gowns which have been rendered impermeable by some process such as oiling.

The first two of these recommendations were immediately put into practice, but it was not thought possible to provide oiled gowns.

TREATMENT OF INFECTIONS

The vast majority of the lesions encountered have been mild and have readily responded to treatment, and perhaps for this reason the doctors have not practised a uniform or coördinated method of treatment. Occasionally local penicillin drops have been used in conjunctivitis, but usually bland lotions applied locally have been combined with systemic sulphadiazine or sulphadimidine ('Sulphamezathine'), and sometimes with penicillin by mouth. Gentian violet has often been used for skin lesions. It is worth noting that one of the five doctors who have treated these cases at various times during
the year expressed his opinion that penicillin
locally or systemically was the least successful m
of treatment he had used.

In accordance with modern practice in many mat
units, no prophylactic eye drops are used at birt

TABLE IX—CARRIER STATE AMONG RESIDENTS OF A STAFF HOSTEL

Date of examination	No. examined	Site of carriage	Carriers of *Staph. pyog*		
			Total		Carry penicill resistant
			No.	% of staff	
Sept. 27, 1949	62	Nose	33	53·2	0

Phage-types of strains isolated

Phage-type	No. of strain
3A	1
3B/3C	1
31A	1
51	2
52A	9
6/7/47	1
N.T.	18

N.T., non-typable.

CARRIER STATE AMONG RESIDENTS OF A SHOP'S H

Swabs were taken from the anterior nares of 62 w
working in a large London store and living in the at
hostel. The total number of women living in the
is about 500; hence the 62 who volunteered fo
investigation only represent a small proportion
hostel population.

The results as regards the carriage of *Staph. py*
are given in table IX. It will be seen that just ove
the women were carrying *Staph. pyogenes*, but
case was any penicillin-resistant strain isolated. Di
phage-types were found, but 9 of the 15 typable s
were phage-type 52A.

ALPHA-TOXIN RESULTS

All 45 strains of *Staph. pyogenes* isolated from inf
processes were α-toxigenic, but 18 of 194 strains is
from carriers did *not* produce α-toxin. This is in agree
with the results of Schwabacher et al. (1945) in
study of the correlation between the coagulase
α-toxin production, and pathogenicity. These wo
found that of 178 strains of *Staph. pyogenes* isolated
cases of infection only 2·7% did not produce α
whereas 6·7–12·3% of strains isolated from ca
were coagulase-positive but not α-toxigenic.

DISCUSSION

We have now become accustomed to the fact
about half of all healthy adults carry potentially p
genic staphylococci in the anterior nares (Hallman
McFarlan 1938, Gillespie et al. 1939, Miles et al. 1
and that among hospital nurses the proportio
carriers is even higher (Miles et al. 1944, Allison
Hobbs 1947). In the hospital where the investiga
here recorded were made not only has the nasal car
rate of *Staph. pyogenes* among the nurses been persist
58–68% but throughout the period of observation 70
of the carriers have carried penicillin-resistant st
In addition, phage-typing of the strains of *Staph. pyo*
isolated has shown that nearly all the typable peni
resistant strains belonged to the single phage-type
This constant carrier state has been maintained
spite of the fact that, since the hospital
training school for midwives, the nurses are con-
changing.

udy of 65 strains isolated both from infected and the conjunctivæ of healthy babies showed 5 were penicillin-resistant, and once again nearly able strains were type 52A.

ems fairly clear from these results that a single of penicillin-resistant *Staph. pyogenes* phage-type spreading round the hospital. Further evidence s was obtained when the staphylococcal carriage the nurses was related to the length of time each had spent in the hospital. This showed that. s only 4 of 23 nurses on entering the hospital were ng penicillin-resistant strains of *Staph. pyogenes*, 16 who had been in the hospital for three months or arried such organisms.

s now generally accepted that penicillin-resistant lococcal infection is much more common among ts who have been in hospital for some time than patients or outpatients (Harley et al. 1946, Forbes Barber and Whitehead 1949, Rountree and n 1949). Barber and Rozwadowska-Dowzenko and Forbes (1949) in this country and Rountree omson (1949) in Australia have related this finding e high nasal carriage-rate of penicillin-resistant s of *Staph. pyogenes* among the nurses of hospitals, ave suggested that this is one of the main sources ection. The present investigations support this stion. It seems likely that nurses in many other tals would also show a high carriage-rate of penicillin-nt *Staph. pyogenes* if similarly investigated.

studies of Voureka and Hughes (1949) and tree and Tomson (1949) and the present investiga-of a London departmental store show that the nce of penicillin-resistant strains of *Staph. pyogenes* noses of the population at large is nothing like so as that in hospital communities. The incidence of illin-resistant strains among the domestics here ed was also low. Though some of these worked in ard, none had close contact with infants, and they in different quarters from the nurses.

e question arises what can be done to make such a tal a more healthy environment. Since the work of pie et al. (1939), Miles et al. (1944), and Williams) it is generally accepted that the main reservoir aph. pyogenes is the anterior nares. The way in a nasal carrier spreads infection has been studied are and Mackenzie (1946) and Duguid and Wallace). These workers have shown that as a rule the r does not infect another person directly from the but infects his clothing or bedding and skin and from sources infects other people.

e aseptic technique used in the present hospital fulfils of the recommendations of Allison and Hobbs (1947) he prevention of the spread of pemphigus neona-m. The additional measures put into practice at the of March did not appreciably affect the incidence fection among the infants. There was, however, a ficant decrease in the skin carriage of *Staph. pyogenes* the nurses in May and August which may have associated with these extra precautions. Further sures are impossible with the present facilities and available. There is no gross overcrowding of ents, and light and ventilation in the hospital are derate.

llison and Hobbs (1947) suggest that the technical culties of adequate preventive measures in nurseries so great that it might be better to give up such favour of mother and infant being nursed together small ward or cubicle. This, however, would entail e rebuilding of most maternity hospitals.

n the meantime it can only be emphasised that nicillin-resistant staphylococcal infections are nearly ays cases of hospital cross-infection. The prevention of both is therefore the same and depends on the hygiene and aseptic control of the hospital.

SUMMARY

In a maternity hospital studied for eight months the incidence of infection among the infants was 14% and remained fairly steady throughout the period of observation.

Staph. pyogenes was isolated from 42 cases of infection; 36 of these yielded penicillin-resistant strains only; 3 yielded penicillin-sensitive strains only; 3 yielded both penicillin-sensitive and penicillin-resistant strains.

Conjunctival swabs taken from 35 healthy infants yielded cultures of *Staph. pyogenes* in 19 cases; in 15 all colonies tested were penicillin-resistant; in 3 all were penicillin-sensitive; in 1 penicillin-sensitive and penicillin-resistant colonies were isolated.

The carrier state of the doctors and nurses of the hospital was studied on three separate occasions at three-monthly intervals. The nasal carrier-rate of *Staph. pyogenes* was throughout 58–68%, and 70–80% of the carriers carried penicillin-resistant strains on each occasion. The skin (back of wrist) carriage-rate, which was 51% on Feb. 22, was only 19% on May 17, and 10% on Aug. 9.

Phage-typing of strains isolated from all these sources showed that in each case the great majority of the typable penicillin-resistant organisms belonged to the same phage-type, 52A.

The carrier state among the domestic staff of the hospital was examined on one occasion. *Staph. pyogenes* was isolated from the nose or skin of 12 out of 17 tested, but only 2 yielded penicillin-resistant strains.

For comparative purposes nasal swabs were taken from 62 women working in a large London department store and living in an attached hostel. Though 33 were carrying *Staph. pyogenes*, none yielded a penicillin-resistant strain.

All of 44 strains isolated from infective processes were shown to have a sensitivity to streptomycin similar to that of the Oxford staphylococcus.

The same 44 strains were tested for sensitivity to sulphathiazole; 42 had a sensitivity similar to that of the Oxford staphylococcus, but 2 were considerably more resistant. Of 22 strains isolated from carriers among the nurses 3 were resistant to sulphathiazole.

We wish to thank the doctors and nurses of the hospital for their coöperation; Prof. Ronald Hare and Dr. Joseph Bamforth for advice; and Dr. R. E. O. Williams and the staff of the Staphylococcal Reference Laboratory for teaching us the technique of phage-typing staphylococci, supplying us with a set of filtrates, and checking many of our results.

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ANTIPYRETIC ACTION OF CRYOGENINE

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THE treatment of fever as such used to be an integral and important part of the treatment of disease, but the advent of bacteriology has so altered the emphasis of therapeutics that the treatment of fever *as a symptom* has largely fallen out of repute. This is understandable, for it is logical to treat the cause of the fever, where this is known, rather than the fever itself. It must, however, be remembered that fever, especially when high, is not always beneficial and may be deleterious to the patient. It necessitates a considerable increase in the basal metabolic rate; it promotes the loss of water from the body by both skin and lungs; it may be responsible for sleeplessness; and, if it is intermittent, the resulting sweats and rigors can exhaust the patient.

When I was his house-physician Dr. J. H. Drysdale prescribed 'Cryogenine' in a case of lymphadenoma. The temperature was high, swinging, and accompanied by severe sweats and rigors, and the general clinical picture resembled that of severe tertian malaria. The effect of the cryogenine, given on two or three days only, was striking, for the temperature fell to normal and remained so for several weeks afterwards, with great benefit to the patient's general condition: The recollection of this case suggested a retrial of cryogenine in lymphatic leukæmia accompanied by considerable fever (case 1). The effect of the drug was similar to that in the case of lymphadenoma mentioned above, and it was therefore given in several other cases.

Cryogenine is phenylsemicarbazide ($C_6H_5NH{\cdot}NH{\cdot}CONH_2$) in the form of white crystals soluble 1 in 100 of water, and 1 in 25 of alcohol 90%. The dose is gr. 3–24 (0·2–1·5 g.) up to gr. 40 (2·5 g.) a day.

Cryogenine was introduced by Lumière and Chevrotier (1902) as a new antipyretic. Gélibert (1902) described it as a white crystalline powder, odourless, and stable in solution. It was non-toxic to animals in intravenous doses of 2 g. per kg. of body-weight. In normal rabbits the temperature fell from 39·9 to 34·1°C after a dose of 0·05 cg. per kg. The cryogenine was excreted in about twenty-four hours, and there was no change in the pulse-rate or respiration-rate. In tuberculous guineapigs a smaller dose produced a demonstrable but smaller fall in the temperature, but there was no change in the course of the tuberculosis. In man there was sweating after doses of gr. 15.

Dumarest (1902) tried cryogenine in typhoid fever, influenza, acute rheumatism, and suppuration, and found its action definite but transitory. In "nervous fever" its action was very good, and in the fever of tuberculosis, especially in the less acute cases, the therapeutic effect was to reduce the temperature with benefit to the patient.

Noé (1903) cited Boy-Teissier and Bruneau (1903) to the effect that a single dose of 0·8–2·0 g. could bring down the temperature in 1 or 2 hours for 6–18 hours in many cases. After several successive doses the temperature would remain down for as long as 4 days.

Carrière (1905) confirmed that the fever of active tuberculosis was especially well reduced and controlled by cryogenine without unpleasant side actions. He found a slight leucocytosis and a slight increase in the output of urine, and a slight lowering of the blood-pressure. (These last two observations might equally be the result of the reduction in the fever.) Carrière confirmed the reputed action of cryogenine on rabbits and guineapigs, and found no bad effect on the appetite, bowel action, gastric secretion, blood-count, or urinary output of normal people. In normal people the temperature would fall within twenty-four hours after a single dose of cryogenine. Carrière tried cryogenine not only in typhoid fever but also in acute enteritis, acute tonsillitis, and acute bronchitis, in all of which conditions its antipyretic action was definite. In bronchopneumonia the effect on the temperature was variable, but in acute tuberculous pleurisy and *active* pulmonary tuberculosis the effect was very pronounced.

Masseguin (1903) confirmed its action in active tube both pulmonary and peritoneal, and made a special of its action in "nervous fever" complicating h paralysis.

Martinet (1903) compared cryogenine with other pyretics, such as antipyrine, acetanilide, phenacetin, 'Pyramidon,' and concluded that it was better in its less dangerous, and less liable to produce adverse

Little more seems to have been written about cry until Sainsbury (1915) reported its beneficial action in f phthisis. He found that a single dose of gr. 10–15 might an effect which lasted several days.

There was a further interval until Leulier and (1935) tried cryogenine in experimental fever produced pigeons with dinitrophenol 10–12 mg. per kg. of body-Their experiments, with controls, proved that in this type fever cryogenine would reduce the temperature measura

Graubner (1936) reported five cases of febrile ph treated with cryogenine in which the temperature definitely lowered during treatment.

Perelli (1937) reported the good effect of cryogenine antipyretic in undulant fever; it lowered the tempe and relieved the associated headache and anorexia.

Hutchison and Hilton (1948) write as follows: pulmonary tuberculosis fever is an indication for rest in and if it continues it is usually necessary to increase t of the diseased part by artificial pneumothorax or some means. The rise of temperature usually occurs in the afternoon and it can be prevented by giving gr 10 of genine about 2 P.M. In advanced cases it sometimes hap that the patient has not the strength to react, and so is no evening rise of temperature and an inverse ty therefore a serious sign. The inverse type of temper produced by cryogenine has not the same significance. the drug is stopped the temperature usually rises again in some cases it remains normal. *It is useful for its ps logical effect on patients who worry about their temperat*

Pisani and Tesi (1946) reported that cryogenine was not only in tuberculous cases with fever but also in pr of uncertain origin. They cited 210 cases of active t culosis and 60 cases of undiagnosed fever treated benefi with cryogenine.

The question naturally arises whether the non-u cryogenine and similar drugs may be due to their or other unpleasant effects. In the published re there are very few indications of any such complicat Carrière (1903) noted in one case a miliary skin erupti a child, aged 14, who was given gr. 7½ three times for several days, and hæmoglobinuria in one case Noé (1903) noted vomiting very occasionally and pro sweating but no collapse. Martinet (1903) rega cryogenine as safer than other febrifuges, and P and Tesi (1946) state that, compared with amidopyri had a much longer action and was much less toxic. his series of 270 cases he found no toxic evidence in case causing him to stop or withhold cryogenine.

CASE-RECORDS

Case 1.—A man, aged 56, was admitted seriously ill fever, profuse perspiration, and headache. Two years viously he had first noted in both groins lumps which slightly, but otherwise he had felt reasonably well spleen had been found to be enlarged and a blood co which had given the following result, suggested lymph leukæmia: red cells 4,800,000 per c. mm., Hb 92%, and cells 160,000 per c.mm., of which 100,000 were lymphoc

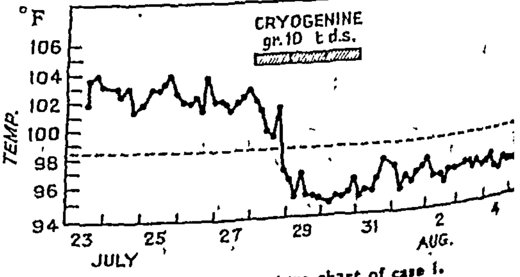

Fig. 1—Temperature chart of case 1.

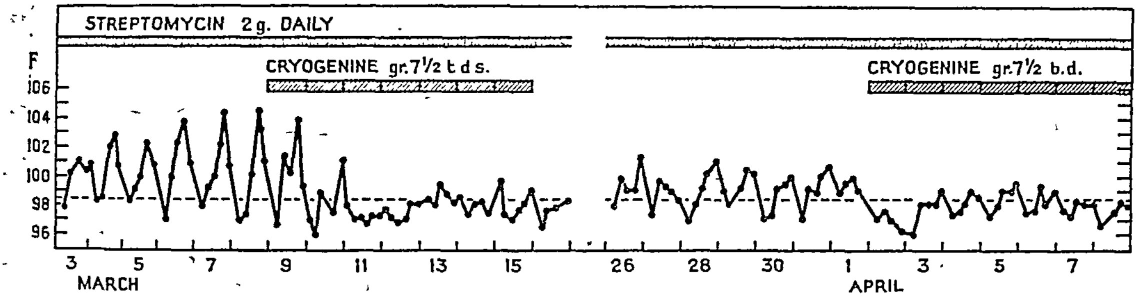

Fig. 3—Temperature chart of case 3.

tient had received deep X-ray therapy, and the leuco- unt had fallen to 7600 per c.mm. He had remained itil his symptoms had returned fifteen months before ion, and he had received a further course of deep therapy. He had improved again, but nine months admission he had had pneumonia which had been fully treated with penicillin. Eight months before ion he had begun to have fever, headache, and loss of e. The fever had remitted after seven days, and had turned. Three weeks before admission he had again febrile and was admitted to hospital.

dmission his spleen and lymphatic glands were enlarged. d-count gave red cells 3,260,000 per c.mm., Hb 46%, hite cells 4200 per c.mm. (3276 neutrophils, 798 ocytes, and 126 monocytes.)

tment.—In view of the high fever, which alone was distressing him, the patient was given cryogenine t.d.s. for three days. The patient became afebrile and went home feeling very much better.

e months later he was admitted with an acute exacerba- om which he died. Though the clinical picture was f lymphatic leukæmia, the histological features, post n, were those of a systematised reticulosis showing in the spleen, liver, lymph-nodes, and bone-marrow.

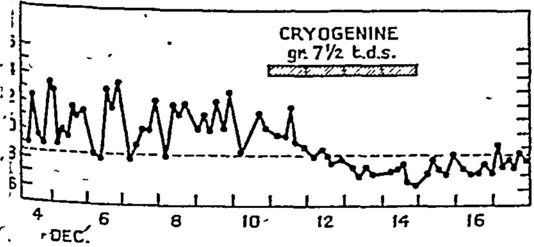

Fig. 2—Temperature chart of case 2.

pleomorphic picture, together with giant cells and sis, suggests that the diagnosis lies between Hodgkin's e and polymorphic reticulum-celled sarcoma. In spite e absence of eosinophils polymorphic reticulum-celled ma cannot be diagnosed in the absence of invasion of unding structures.

se 2.—A married woman, aged 34, had been, three years e admission, an inpatient under my care, with rheumatoid itis and patent ductus arteriosus. Her general condition een poor, and she had had the typical but not severe nities of rheumatoid arthritis affecting the joints of the s, wrists, knees, and ankles. In view of her rather poor que ligation of the ductus had been postponed. A year her erythrocyte-sedimentation rate (E.S.R.) being now 9, fever being absent, and her general condition being r, the patient had been transferred to the care of Mr. O. S. s, who had tied the ductus arteriosus. She had made a good recovery from this and had been discharged without udible ductus murmur. *Seven months before admission,* and swelling had returned to her joints, and she had me generally less well.

n hospital she developed a considerable fever, the tempera- averaging 102°F but occasionally rising to 103°F. The e of this was uncertain, but the E.S.R., which on admission 32 mm. in an hour, rose to 50 mm. in an hour. A blood- ture was sterile, and no abnormality was seen in a chest iogram. There was no appreciable leucocytosis. A white-cell count at this time was between 7300 and 11,000 per c.mm. The urine was sterile.

Treatment.—Because the symptoms were being aggravated by the persistent fever, cryogenine gr. 7½ t.d.s. was given for four days. The temperature fell to normal in twenty-four hours (fig. 2), and the patient felt much better. After a further three weeks' observation, during which she remained afebrile, she was discharged.

Case 3.—An unmarried girl, aged 22, was admitted after having been ill two and a half months with persistent dry cough, severe night sweats, rapid loss of weight, and extreme fatigue at the end of her day's work as a barmaid.

On admission she was very ill and was obviously severely wasted. Her temperature was spiky and remained for the first five weeks of her time in hospital between 99° and 103°F. Her heart-rate averaged 130, and her respirations 35 per min. Radioscopy of her chest showed a widespread miliary tuberculosis.

Treatment.—The patient was given streptomycin 2 g. daily by injection, but this had no demonstrable effect on her fever or heart-rate. At the end of her fifth week in hospital it was considered that the severe swinging fever, with its associated profuse sweating, was a definite clinical handicap to her condition; therefore cryogenine gr. 7½ t.d.s. was given for a week. The effect was dramatic, the temperature remaining below 99·4°F for the whole of that period after the first two days (fig. 3). Three days after the discontinuance of cryogenine the temperature began to rise again, but remained at a definitely lower level, the average mean reading being below 100°F. After a further fortnight cryogenine gr. 7½ was given twice daily for a fortnight, and during this time the temperature remained below 99·2°F (fig. 3). Cryogenine was then discontinued, and the temperature mounted once more. The course of the tuberculosis was slowed by the streptomycin, but the patient died after having been in hospital just over five months.

Case 4.—A man, aged 54, had begun, thirteen months before admission, to get a little breathless on exertion while at his work as a railwayman. Nine months before admission he had begun to cough, without sputum, and this had disturbed his night's sleep. *Three months before admission he had* begun to produce occasionally bloodstained sputum. He had then become increasingly breathless, had had to stop work, and had been admitted to the East Surrey Hospital, Redhill, for investigation, whence he was transferred to St. Bartholomew's.

On examination he was rather wasted, his trachea was slightly deviated to the right, and the right side of his chest was flattened and moved poorly. Physical signs of pulmonary collapse were present at the right base. Clubbing of the fingers

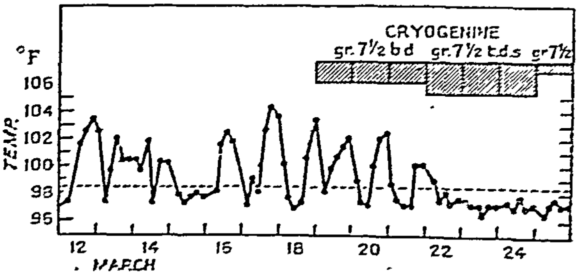

Fig. 4—Temperature chart of case 4.

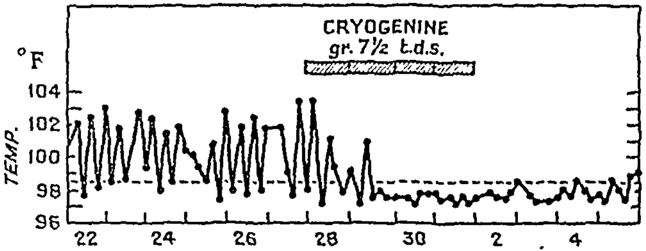

Fig. 5—Temperature chart of case 5.

was well marked. Radiography showed a definite shadow in the posterior part of the right lung, presumably due to a mixture of collapse and consolidation; the picture was typical of a neoplasm. Bronchoscopy (Mr. O. S. Tubbs) showed constriction of the right upper bronchus, which was nearly occluded by a proliferative growth, sections of which showed it to be an oat-celled carcinoma.

Progress.—The patient had fever during the whole of his three-month stay in hospital; it was moderate at first, but halfway through March there was a swinging temperature between 97° and 103°F. Since clinically the patient did not seem to have severe toxæmia with this fever, and since his white-cell count during this time fell from 15,300 to 9500 per c.mm., cryogenine gr. $7^1/_2$ was given twice daily for three days, t.d.s. for three days, and twice daily for one day. Not only did the temperature fall to normal after a week (fig. 4), but it remained nearly normal for the rest of the patient's two and a half weeks' stay in hospital, except for a few occasions on which it rose to 99·0–99·8°F. The patient was then discharged.

Case 5.—A married woman, aged 57, had ten months before admission felt abnormally tired and begun to lose her appetite. Eight weeks before admission she had begun to have a dull ache to the left of the umbilicus, to feel nauseated, and to have severe attacks of sweating, chiefly at night. These attacks had been followed by shivering. The nausea and fatigue had increased, and she had been referred to Dr. Bodley Scott, who has kindly allowed me to add her to this series of cases.

On admission to the Florence Nightingale Hospital the patient had fever rising to 102°F at night associated with rigors. Her spleen was enlarged. She was treated by chemotherapy and with penicillin, which cured a urinary infection by *Strep. viridans* but had no effect on the fever or rigors. After investigation for typhoid and *Brucella abortus* infections, which were negative, a biopsy specimen from a gland on the right side of the neck suggested an infective condition and was not typical of a reticulosis.

Treatment.—In the absence of a diagnosis the patient was given cryogenine gr. $7^1/_2$ t.d.s. for four days, which caused an immediate disappearance of the fever (fig. 5), the temperature remaining down for three weeks. In view of the severe anæmia and the enlarged spleen the patient was referred to Mr. Allan Hunt for abdominal exploration, since it was felt that splenectomy might cut short the hæmolytic process. The spleen was removed, and its histological and pathological appearance suggested lymphosarcoma.

DISCUSSION

Perhaps the most interesting point about the action of cryogenine in this series is that a small dose seems to be sufficient to reduce the temperature, and that, after this fall has been achieved, the effect continues for a much longer time than can be explained on general principles by a continued action of the cryogenine. This is seen in all of the cases here described except case 3 (miliary tuberculosis). In this case cryogenine reduced the fever each time it was given; but, when cryogenine was withheld, the temperature rose within twenty-four hours to its previous higher level.

Cryogenine seems to be an effective antipyretic in some cases, and should therefore be considered in cases in which reduction of the temperature may be important or when "nervous fever" is suspected. The rather dangerous diagnosis of "nervous fever" should only be made after an extremely full investigation has proved negative, in patients in whom the E.S.R. and w count are normal in spite of considerable fever, in the temperature has been carefully checked by a sible nurse, and in whom there is other evidence of h or psychological abnormality. Further, cryogenine be particularly useful in controlling the fever of the reticuloses where the raised temperature apparently as part of the clinical picture irres of any intercurrent infection.

The fact that cryogenine exerts a rapid effect persists for days or weeks, long after the cryo must have been either excreted or neutralised by body, suggests that it has some action on the heating centre. It is arguable that sometimes fever is to a minor disorder of this centre and that cryo renders it more sensitive to the physiological pr and nervous impulses which control the temperatu accurately in healthy people.

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VITAMIN E IN INTERMITTENT CLAUDICATION

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The connexion between the tocopherols (vitami and the development of the vascular system was repo by Adamstone (1931) from the study of chick embr and later by Mason (1943) from rat embryos.

The clinical improvement of cases of senile vu vaginitis after treatment with large doses of vitami was reported by Shute (1942). The appearance of bio specimens of vulvar tissue after such treatment sugge to Shute that the improvement was due to prolifera of new capillaries or the reopening of old colla capillaries. From the time-lag of 2–4 weeks be improvement took place and on physiological gro it was considered that proliferation of new capill was the more likely.

The effect of tocopherol therapy on vascular dis of the legs was reported by Shute et al. (1948). Cli studies of various conditions, including thrombophleb indolent ulcers, early gangrene, and "thromboang obliterans," suggested that vitamin E was of valu such conditions.

The clinical results of vitamin-E therapy in 81 cas obliterative vascular disease of the legs with intermit claudication have been analysed by Boyd et al. (19 It is from the data compiled on these and subsequ patients treated from the neurovascular clinic at Manchester Royal Infirmary that the following c have been selected.

INTERMITTENT CLAUDICATION

A routine clinical examination is made of all pati complaining of intermittent claudication, the res being entered on a standard form. The data recor include the location of the pain, the history of the co gress of the condition, the state of nutrition of the e presence or absence of pulses, and oscillometric s at various points on the leg. These data enable lerlying vascular lesion and the affected muscle be recognised (Boyd et al. 1949). It then remains severity of the condition to be assessed before the nt can be decided. Where the state of nutrition that the limb is in danger, the primary effort e directed to saving the leg. Where the limb is langer, the treatment is aimed at the relief of the ive manifestation of pain which interferes with ient's daily life. The circulatory deficiency of the st therefore be assessed in the light of the demand n the patient's blood-supply. The required data tained by testing the patient's ability to walk controlled conditions.

patient is exercised by walking either over a known of the hospital corridors or on a "claudicometer," ng of a platform over which runs an endless or belt driven by an electric motor through a iously variable V-belt system. The rate of walking led by the patient as being his normal pace.

n the claudication pain begins, the distance is y the observer. The patient is not allowed to rest urged to continue walking as far as possible, meanescribing the subjective phenomena. The distance h the patient eventually halts is also noted. From a obtained it is possible to classify the severity of ndition as belonging to one of three types.

rationale of the classification depends on a conion of the events taking place in a muscle during e. The blood-supply to a muscle at rest is scanty increases considerably with exercise (Krogh 1922). muscle is exercised under conditions of ischæmia, sults (Lewis et al. 1929). Though the exact mechaof the vasodilatation and the production of pain ot been fully described, it cannot be doubted he initiating event is the accumulation of metain the contracting muscle (Hamilton 1947). With ing exercise the level of metabolites will become when the rate of elimination is equal to the rate duction. With normal blood-supply stabilisation place below the threshold of pain; but in the ant, with reduced blood-supply, the pain threshold hed before stabilisation. The level at which equi can be attained depends on the relation between supply and demand, and it is this level which ines the severity of the pain and the clinical type dication.

THREE CLINICAL TYPES

e *I.*—In this type the blood-supply and demand out equal. Before maximum vasodilatation is ed the pain threshold is crossed, but equilibrium is ally reached below the threshold. On walking, pe-I claudicant complains of the onset of pain, but ntinuing to walk he announces, usually with some se, that the pain has disappeared. That the equin is just below the pain threshold can be demond by increasing the rate of walking above the l, causing the pain to return.

pe *II.*—Here equilibrium is reached above the hold of pain. On continuing to walk after the onset e claudication the patient says that the intensity of pain remains much the same. Eventually he stops ing, not because of any increase in intensity but use of the persistence of the pain. Naturally the nt with the less intense pain tends to walk further the patient with the more severe pain.

pe *III.*—Equilibrium is never reached with this ; the deficiency of blood-supply is such that the becomes intolerable before that point. The type-III ent, on being urged on after the onset of claudication, es that the pain is growing worse, and he halts a short ance further on, obviously in extreme pain.

SELECTION OF CASES

It is beyond the scope of this paper to discuss the treatment of intermittent claudication. Details are given in the paper by Boyd et al. (1949). Symptomatic relief is in general obtained in the type-I patient by any treatment in which the patient has confidence leading to his taking the increased exercise necessary to develop his collateral circulation; in the type-II patient by methods designed to increase the blood-supply beyond the demand (lumbar sympathectomy gives the best results); in the type-III patient by methods designed to reduce the demand for blood (the blood-supply cannot be increased to bridge the gap).

In the type-II claudicant, though sympathectomy gives the greatest improvement, it is often contraindicated for other reasons. It is for this type of patient that vitamin-E therapy is used. The treatment recommended by the neurovascular clinic consists of the synthetic α-tocopherol ('Ephynal' Roche) 400 mg. daily by mouth.

The criteria for the inclusion of cases in this series are as follows:

1. Type-II claudicants for whom sympathectomy is contraindicated.
2. The patient must not have had any other treatment.
3. The halting distance must not exceed 500 yards—the reason for this restriction is apparent from the method of assessment of results.

SELECTION OF CONTROLS

During the investigation of intermittent claudication some patients were given substances—e.g., nicotinic acid —which it was believed might relieve the condition. Certain patients for whom vitamin E was recommended were either not given the treatment by their own doctors or were given inadequate doses. For purposes of comparison with the results obtained from vitamin-E therapy it has been decided to class all these patients as having been on a placebo treatment. For inclusion in this control series the same criteria have been applied as for those cases treated with ephynal.

ASSESSMENT OF RESULTS

The patient's chief concern is the interference with his daily life by the pain on walking. As the treatment of the cases in this series was directed to the relief of this pain, assessment of results has been made on the patient's ability to walk. The cases were reviewed after about three months' treatment, when a walking test like that used for the original typing was made. It was considered that to walk 880 yards was in most cases economically desirable. The criterion for improvement was thus arbitrarily fixed as the ability to walk a minimum of 880 yards with either complete freedom from pain or what the patient regarded as very minor discomfort. All other cases have been classed as "not improved," though certain of the patients on vitamin-E therapy more than doubled their original halting distance.

RESULTS

Of the patients for whom α-tocopherol therapy had been recommended by the neurovascular clinic 41 fulfilled all the requirements necessary for inclusion in this series. The walking test after three months' treatment showed that 34 were "improved" and 7 were "not improved."

The controls numbered 25. The walking test showed that 5 of these were "improved" and 20 "not improved."

The significance of these observations can be judged most simply by a two-by-two contingency table. The modified form, quoted by Fisher and Yates (1948), for experimental data involving small numbers gives $\chi^2=37{\cdot}4$. From the tables in the same book for $n=1$ and $p=0{\cdot}001$, $\chi^2=10{\cdot}8$. The results may therefore be classed as "highly significant."

DISCUSSION

The literature of α-tocopherol therapy is vast and highly controversial. The situation has been further complicated by the appearance of articles in the popular press hailing vitamin E as a substance which to all intents and purposes is a universal remedy.

In November, 1946, the Council of the College of Physicians and Surgeons of Ontario considered claims made by the Shute brothers for the usefulness of vitamin-E therapy in cardiovascular disease. The conclusion of the council was the equivalent of the old Scottish verdict of "not proven," with about the same damning result (Noble 1947). But, whatever the findings about the treatment of cardiovascular conditions in general, it is difficult to explain the improvement in certain cases cited by Vogelsang et al. (1947, 1948) as being due to causes other than vitamin-E therapy.

A complete review of the arguments which have been advanced for and against α-tocopherol therapy is not feasible here. Certain points, however, demand mention. The most important of these is that, to be effective, vitamin E must be given in large doses and for a long time. Both from published reports and from a study of the cases treated from the neurovascular clinic it seems that the optimum dosage is about 400 mg. daily. This should be given in the form of α-tocopherol, the biological activity of the β- and γ-tocopherols being considerably less (Mason 1943). One of the most striking observations in connexion with vitamin-E therapy is the delay before the patient begins to notice any improvement. In obliterative vascular disease this delay is from four to eight weeks, the average being about six weeks. Negative evidence of the effectiveness of vitamin-E therapy with doses of less than 400 mg. daily for periods shorter than three months must therefore be considered inadmissible. Conversely, reports of success with small doses or treatment for a short time must also be suspect.

In diseases of the circulatory system the number of variables involved may be large and the assessment of progress hazardous. In reporting 13 cases of cardiovascular lesions Levy and Boas (1948) stress the difficulty of estimating the improvement. Even when, as in patients with intermittent claudication, a yardstick of improvement—albeit an artificial one—is available it must be used with care. Thus it would be possible to present a series of type-I cases in which 100% success was obtained; but other substances are equally successful in this type. A series of type-III cases judged by the walking test would be a complete failure. It should be observed, however, that in certain type-III patients to whom vitamin E was given, though their ability to walk did not increase sufficiently to be considered as "improved," a considerable change for the better was noticed in the nutrition of the feet.

Of the 7 "not improved" patients in this series one, who had originally been diagnosed as having diffuse obliterative arteritis, later had a secondary popliteal thrombosis, which would be sufficient to explain the lack of improvement. Examination of the case-records of the other 6 did not reveal any common factor which might suggest that vitamin-E therapy would not succeed.

From the economic point of view it must be admitted that α-tocopherol is expensive. Presumably therefore it should be used only where there is a reasonable hope of success that could not be achieved by other means. Even in these cases, however, to give inadequate doses for short periods is just as wasteful as to use the substance haphazardly.

SUMMARY

Cases of obliterative vascular disease leading to intermittent claudication were selected from the records of the neurovascular clinic at the Manchester Royal Infirmary.

The criteria for the selection of cases for with vitamin E and of the controls are detailed.

The results were assessed after three months' by testing the ability to walk. Patients treatment had been forced to halt at less than were classed as "improved" if after tr could walk more than 880 yards.

Of 41 cases in the treated group 34 were of 25 cases in the control group 5 were χ^2 test shows that the results may be classed as "significant."

Points in connexion with the use of including the necessity for high dosage treatment, are discussed.

For permission to publish these cases I wish Prof. A. M. Boyd, professor of surgery in the U Manchester and director of the neurovascular cl Manchester Royal Infirmary.

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INHIBITION BY METHIONINE O TOXICITY OF CRYSTALS FRO AGENISED ZEIN

OBSERVATIONS ON LEUCONOSTOC MESEN

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THE isolation from agenised zein of a substance which is toxic to rabbits and dogs wa recently from these laboratories (Bentley et It was shown further (Heathcote 1949a) crystals are markedly toxic to the bacterium, *mesenteroides* P 60, even at concentrations 5 µg. per ml. of liquid medium, the bacterial agglutinated and acid production substantiall Still smaller concentrations—e.g., 1–5 µg. produced milder effects resembling the a effects of certain chemicals on acid-producin

EFFECT OF ADDING METHIONINE TO CULTURE M TOXICITY OF CRYSTALS TO *L. mesenteroide*

EXPERIMENT I

Concentration of toxic crystals in full-growth medium (µg./ml.)	*dl*-Methionine added to medium (µg./ml.)	Mean titre (ml. of 0·01*N* NaOH)	Toxic of ag or di in nu ba
Nil	..	1·13	++
200	..	0·11	
50	..	0·57	
50	ca. 1000	1·04	

EXPERIMENT II

Nil	..	2·70	
20	..	1·38	
20	100	2·44	
20	500	2·44	
20	1000	3·02	

1945, Heathcote 1949b), which are believed to be an unbalanced mixture of amino-acids.

reliminary work on the mode of action of the toxic s on this bacterium relatively large doses of individual amino-acids, including those known to ential for its growth, were added to the culture n. The amino-acids examined were: *dl*-alanine, ine monohydrochloride, *dl*-aspartic acid, *l*-cystine, eine, glycine, *l*-glutamic acid hydrochloride, sodium tate, *l*-histidine monohydrochloride, *l*-hydroxy- . *dl*-isoleucine, *dl*-leucine, *dl*-lysine, *dl*-methionine, ylalanine, *dl*-proline, *dl*-serine, *dl*-threonine, *dl*-phane, *l*-tyrosine, and *dl*-valine.

hese amino-acids, methionine alone showed any on the toxicity. The addition of sufficient nine to the medium nullified the toxic effect estored acid production as illustrated in the panying table.

n these and other experiments it appears that the substance formed by the action of nitrogen tri-le on zein is absorbed by the bacteria in similar r to methionine but that when methionine is t in excess it is preferentially absorbed. Conse-y, it is not unlikely that the toxic substance is to methionine in chemical composition, in which t is based on the methionyl residue of the zein le. More detailed evidence implicating methionine essential reactant is contained in a further paper hese laboratories (*Nature, Lond.* in the press).

e nitrogen trichloride can act as an oxidising the simple oxidation products of methionine— nine sulphoxide and methionine sulphone—were for toxicity towards *L. mesenteroides* P 60. The ne was found to be more toxic than the sulphoxide he toxicity of both compounds was negligible red with that of the crystals isolated from agenised The crystals cannot, therefore, be identified with of these two compounds. This result is in keeping the comparative harmlessness of oxidised peptone n et al. 1947), containing methionine sulphone, it is used as a medium for microbiological assays, . *mesenteroides* P 60 as the test organism.

ther evidence suggesting a relationship between known substance and methionine is derived from onine assays on hydrolysates of the crystals red from agenised zein. Hydrolysis with 2·5*N* HCl autoclave at 15 lb. pressure for 6, 12, and 24 hours, h causing some reduction in toxicity, did not etely destroy it. Treatment with 6*N* HCl for 68 at 110°C, however, completely removed all toxicity. a hydrolysate of crystals (0·5 mg.) prepared in ay the excess acid was removed on a water bath he hydrolysate was neutralised and made to volume. olution was tested in the usual manner (Heathcote) to ensure the complete absence of toxicity ds *L. mesenteroides* P 60 and was then assayed ethionine using the same organism and a supple-d medium of oxidised peptone ('Difco'). The result e microbiological assay indicated a methionine-ement value equivalent to 0·8% of *l*-methionine. r chromatograms on the hydrolysed material failed eal the presence of free methionine. The inference ore is that the hydrolysis produces some substance ssing only partial methionine-replacement value he organism.

is work supports the conclusion in an earlier paper these laboratories (Bentley et al. 1948): that it is methionine portion of a protein molecule which gives xic properties when it is treated with nitrogen loride.

SUMMARY

he addition of methionine arrests the toxic effect on conostoc *mesenteroides* P 60 of the crystals isolated agenised zein. This finding is in keeping with the view that it is the methionine portion of the protein molecule which is essential for the production of the toxic substance.

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EOSINOPHILIC LEUKÆMIA AND FAMILIAL EOSINOPHILIA

TWO ILLUSTRATIVE CASES

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Thomsen and Plum (1939), reviewing eosinophilic leukæmia, summarised 14 published cases, since when a further 9 cases have been described:

Drennan and Biggart (1930) described a case of eosinophilic response to an irritant in a boy, aged 15 years, whose leucocytes numbered 61,000–73,000 per c.mm. (eosinophils 28–70%).

Stephens (1935) described a case of acute eosinophilic leukæmia in a girl, aged 17, with 130,000 leucocytes per c.mm. (eosinophils 68%), and Reye (1940) another in a boy, aged 5½ years, with 160,000 leucocytes per c.mm. (eosinophils 72%).

Lepak (1940) described eosinophilic leukæmia, possibly complicated by tuberculosis, in a man, aged 41, with 9500–40,300 leucocytes per c.mm. (eosinophils 15–30%).

Bass (1941) reported the case of a boy, aged 6½ years, with 9400–51,000 leucocytes per c.mm. (eosinophils 29–70%).

Goehl (1942) reported a case of eosinophilic leukæmia in a male, aged 18, with 7900–190,000 leucocytes per c.mm. (eosinophils 5–88%).

Fenner (1943) reported one in a male, aged 19, with 56,000–63,000 leucocytes per c.mm. (eosinophils 55%).

Friedman et al. (1944) reported one in a boy, aged 11 years, with 126,000 leucocytes per c.mm. (eosinophils 82%).

Hodgson et al. (1945) reported a case of myeloid leukæmia, probably eosinophilic, in a woman, aged 44, with 46,000 leucocytes per c.mm. (eosinophils 43%).

Sex and Age.—Of the 23 cases 18 have been in males. The age-incidence ranges from 1 year 4 months to 55 years, the distribution being 6 cases in the age-group 1–14 years, 4 in that of 15–20 years, 2 in that of 25–35 years, and 9 in that of 40 years or more; in 2 cases the age was not given.

Duration.—The duration of the illness, where stated, was in 5 cases more than two years, and in 13 cases was from a few days to fourteen months, suggesting that eosinophilic leukæmia tends to run an acute rather than a chronic course.

Eosinophilia.—The percentage of eosinophils ranged from 41 to 70, with an average of 63. The white-cell count fluctuated from normal to more than 200,000 per c.mm., the average being about 76,000.

Liver, Spleen, and Lymph-glands.—Enlargement of the liver, spleen, and lymph-glands was not constant. Any combination might be present or absent at any time of the disease. In nearly every published case attention was drawn to the maturity of the eosinophils in the peripheral circulation, the coarseness and heaping of the granules, and the vacuolation. Eosinophil and neutrophil metamyelocytes, myelocytes, myeloblasts, and normoblasts were met with in the serial counts in all the published cases. The myeloblasts ranged from 0·5 to 9% of the differential count. 2 cases (Stephens 1935, Thomsen and Plum 1939) terminated in a myeloblastic crisis.

Marrow.—The marrow picture varied. In Thomsen and Plum's (1939) case 40% "stem" cells were found, and in Stephens's (1935) cases 98% "blast" cells; Goehl (1942) found many myeloblasts, and Hodgson et al. (1945) 7% myeloblasts. However, Bass (1941), Fenner (1943), and Friedman et al. (1944) reported that the marrow was normal except for a great preponderance of mature eosinophils, as was also found in the present case.

Necropsy.—Widespread infiltration of voluntary muscle, myocardium, pulmonary alveolar walls, splenic pulp, lymph-glands, liver, and kidneys by mature eosinophils was found. The cause of death in most cases was heart-failure due to infiltration. Mural thrombi were found in 4 cases, those of Reye (1940), Thomsen and Plum (1939), and Stephens (1935), and in the second case published by Hay and Evans (1929).

CASE-RECORD

Case 1.—A boy, aged 1 year 4 months, was admitted on Jan. 1, 1948, with bronchopneumonia and mild rickets. Radiography of his chest showed patchy areas of consolidation in both lower lobes. Blood examination showed Hb 61% (Haden) (9·52 g. per 100 ml.), white cells 17,800 per c.mm. (neutrophils 26%, lymphocytes 51%, eosinophils 20%, monocytes 3%, basophils 0).

Jan. 9.—Chest clearing. Liver and spleen impalpable. Lymph-glands not enlarged. Mantoux 1/1000 negative. White cells 20,000 per c.mm. (neutrophils 12%, lymphocytes 76%, eosinophils 12%, monocytes 0, basophils 0). Hb 72% (Haden) (11·32 g. per 100 ml.).

Feb. 4.—Neither ova nor worms were discovered on repeated stool examinations. Casoni intradermal test negative. White cells 44,000 per c.mm. (neutrophils 13%, lymphocytes 30%, eosinophils 55%, monocytes 1%, basophils 1%).

Feb. 13.—A short course of arsenic was begun. Liver three finger-breadths below the costal margin. Spleen impalpable. Small hard discrete glands in axilla, neck, and groin. White cells 33,000 per c.mm. (neutrophils 10%, lymphocytes 45%, *eosinophils 45%, basophils 0, monocytes 0). Hb 62% (Haden)* (9·67 g. per 100 ml.).

Feb. 22.—Spleen impalpable. Liver still three finger-breadths below the costal margin. Its edge was thin and sharp. White cells 35,000 per c.mm. (neutrophils 12%, lymphocytes 33%, eosinophils 53%, monocytes 2%, basophils 0). Normoblasts 1%. Hb 70% (Haden) (10·92 g. per 100 ml.).

Feb. 27.—Glands in the right axilla were enlarged. Liver as before. White cells 35,600 per c.mm. (neutrophils 11% lymphocytes 36%, eosinophils 50%, monocytes 1%, basophils 0, eosinophil myelocytes 2%). Wassermann reaction negative.

March 1.—The patient was discharged. White cells 24,300 per c.mm. (neutrophils 20%, lymphocytes 50%, eosinophils 28%, monocytes 2%, basophils 0). Hb 66% (Haden) (10·3 g. per 100 ml.).

March 31.—The patient attended hospital outpatients with another attack of bronchitis. Spleen palpable. Liver three finger-breadths below the costal margin. *White* cells 81,800 per c.mm. (neutrophils 17%, lymphocytes 24%, eosinophils 54%, monocytes 1%, basophils 0, neutrophil myelocytes 3%, eosinophil metamyelocytes 1%). Normoblasts 1%. *Hb 65% (Haden) (10·14 g. per 100 ml.).*

June 14.—The patient was seen again for the first time since March. Spleen impalpable. Liver still three finger-breadths below the costal margin. Lymphatic glands still enlarged. White cells 49,600 per c.mm. (neutrophils 33%, lymphocytes 35%, eosinophils 30%, monocytes 2%, basophils 0). Hb 66% (Haden) (10·3 g. per 100 ml.).

June 26.—White cells 22,200 per c.mm. (neutrophils 16%, lymphocytes 47%, eosinophils 36%, monocytes 0, basophils 1%). The tibial marrow contained hæmocytoblasts 0·5%, erythroblasts 3%, normoblasts 8%, myeloblasts 1·5%, early myelocytes 6%, neutrophil myelocytes 3%, neutrophil metamyelocytes 4%, neutrophil polymorphs 13%, eosinophil myelocytes 11%, eosinophil metamyelocytes 9%, eosinophil polymorphs 35%, lymphocytes 5·5%, monocytes 1·5%. Leuco-erythroblastic ratio 7·5 to 1.

The eosinophils seen in the peripheral blood and marrow smears were mostly bilobed mature cells. The granules were coarse and tended to "heap" in the cytoplasm. There was well-marked vacuolation. The nucleus was
and the cytoplasm did not stain.

The cells called early myelocytes in the marrow
somewhat of a puzzle; except for a loss of intensity
in the nucleus and the presence of granules, they c
been called myeloblasts. The nucleus filled the cell
one pole, where there was a slight indentation, and
paler than the myeloblast. At the indentation ther
a few granules, some eosinophilic and others ma
basophilic.

Examination of Relations.—A history of allergy w
obtained. The mother's white-cell count gave 8400 leu
per c.mm. (neutrophils 72%, lymphocytes 18%, mon
6%, eosinophils 4%, basophils 0). The father's whit
were 4700 per c.mm. (neutrophils 56%, lymphocytes
monocytes 2%, eosinophils 0, basophils 1%). *The pa*
sister had 11,250 white cells per c.mm. (neutrophils
lymphocytes 16%, monocytes 6%, eosinophils 4%, ba
1%). His twin brother had 13,100 white cells per
(neutrophils 23%, lymphocytes 70%, monocytes 5%,
phils 2%, basophils 0). The diagnosis was th
eosinophilic leukæmia.

FAMILIAL EOSINOPHILIA

Familial eosinophilia is much rarer than eosin
leukæmia. Stewart (1933), reviewing the published
reported 4 of his own, Malmberg (1939) added

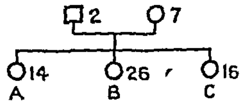

Fig. 1.

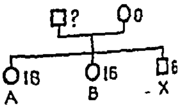

Fig. 2.

Atmar (1940) published 1 with a report on a
specimen of the liver. Bowman (1941) describe
families in which the diagnosis might reasonal
entertained. The number of families with f
eosinophilia reported hitherto is fourteen (not inc
the one here presented). The familial incide
the four families described since Stewart's (1933)

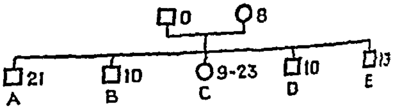

Fig. 3.

is shown in figs. 1–4. In Bowman's patient (fig.
eosinophils were of adult type, the spleen and l
nodes were enlarged at various times, and the m
showed eosinophil hyperplasia. The patient a
two sisters were subject to urticaria. In Atmar's
family no parasites were isolated and the Wass
reaction was negative. When the patient was op
on for repair of a ventral hernia, the liver was s

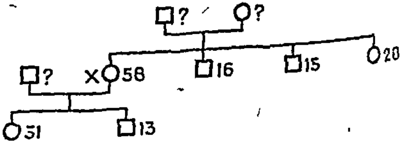

Fig. 4.

have multiple grey areas about 1 *cm.* in dia
A biopsy specimen showed intense infiltration of th
parenchyma with mature eosinophils.

Inheritance.—Analysis of the published family hi
shows that eosinophilia was transmitted throu
mother in 11 families, through the father in
through both parents in 2.

Allergy.—Of the families reported, 5 show alle
one or more members (Klinkert 1911, Stewart
Bowman 1941).

Eosinophilia.—The average percentage of eo-in
in the differential white-cell counts was 21%, the
being from 4 to 80%. The total white-cell
varied from normal to 46,000 per c.mm. Inexp
transient eosinophil leucocytoses lasting up to
months were encountered in the affected families.

ot accompanied by any signs of ill health. As the phil percentage rose, the neutrophil-count fell, ie result that at maximal eosinophil-counts there ı absolute neutropenia. The eosinophils in the eral circulation were normal adult cells and l in no way from those seen in routine counts. s in contradistinction to the picture presented in philic leukæmia. In none of the families reported ny immature eosinophils noted in the smears.

r, Spleen, and Lymph-glands.—At various times, erved members of the families, the liver, spleen. mph-glands enlarged temporarily.

row.—The marrow presented an orderly pro- ve maturation in which the emphasis in the lar elements was on the eosinophil at the expense neutrophil.

CASE-RECORD

e 2.—A boy. aged 2 years 4 months, was referred to ients on Feb. 27, 1948, with a history of pallor for nine s. He was otherwise apparently healthy. There was inite family history of allergy. but his mother had had rh" for many years. The patient had had bouts of itis with wheezing. A blood-count had been done on .6 privately. The white-cell count was given with no on of a differential count. Eosinophilia had thus been l—a lesson on the necessity of looking at every film. *examination* the patient appeared pale, his liver edge st palpable, but his spleen was impalpable. The left al glands were slightly enlarged, but the other lymph- s were normal. A blood-count showed red cells 5,060,000 mm., Hb 66% (Haldane), colour-index 0 65, white cells) per c.mm. (polymorphs 11·5%, lymphocytes 25·5%, ytes 1%, eosinophils 59·5%, basophils 2·5%).

rch 5.—The patient was admitted for investigation. nx test 1/1000 negative. Erythrocyte-sedimentation mm. in 1 hour (Westergren).

rch 8.—Hb 66%, white cells 22,500 per c.mm. (poly- s 16%, lymphocytes 24%, monocytes 2·5%, eosinophils plasma cells 0·5%). Three stools were examined, but r ova nor worms were seen. No obvious cause for the philia was found.

imination of Relations.—The patient's father had 6400 cells per c.mm. (polymorphs 68%, lymphocytes 27%, cytes 4%, eosinophils 0·5%. basophils 0 5%), and his er had 6800 white cells per c.mm. (polymorphs 54%, hocytes 28·5%, monocytes 3·5%, eosinophils 11·5%, hils 2 5%).

rrow.—The patient's tibial marrow gave a total nuclear of 58,500 per c.mm. (hæmocytoblasts 0·2%, pro-erythro- s 0·2%, normoblasts 3·8%, myeloblasts 0·6%. pre- cytes 1·4%, neutrophil myelocytes 0·9%, eosinophil

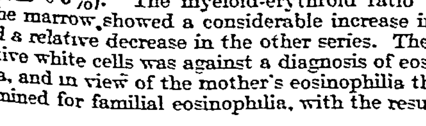

Fig. 5.

ocytes 6·8%, neutrophil metamyelocytes 1·8%, neutro- polymorphs 16·0%, eosinophil leucocytes 34·9%, basophil cytes 0·2%, lymphocytes 28·9%. monocytes 4·0%, a cells 0·3%). The myeloid-erythroid ratio was 15·6 . The marrow showed a considerable increase in eosino- and a relative decrease in the other series. The absence mitive white cells was against a diagnosis of eosinophilic æmia, and in view of the mother's eosinophilia the family examined for familial eosinophilia, with the result shown g. 5.

The blood-group genotypes of the patient and his parents e as follows: father A,r r, mother B,R R, and the patient R r.

March 25.—The patient was discharged unimproved. with diagnosis of familial eosinophilia.

DISCUSSION

Hæmatologists have been reluctant to admit the istence of eosinophilic leukæmia as a pathological tity. It does not exhibit the characteristics which they pect of a leukæmia, and other eosinophilias reported as possible leukæmias have, in the light of newer knowledge, been found to belong to Löffler's syndrome or tropical eosinophilia. Nevertheless that this condition is a form of leukæmia is strongly suggested by the following facts: (1) the eosinophil is abnormal: (2) each case has shown immature forms in the peripheral bloodstream if followed long enough—in contradistinction to familial eosinophilia. where, in spite of a persistent leucocytosis, immaturity is never seen, and the eosinophil looks normal; (3) the condition can end as a myeloblastic state; and (4) the marrow films show a reversion to immaturity. which is not seen in familial eosinophilia.

The point of departure from ordinary myelogenous leukæmia seems to be at the early myelocyte or premyelocyte stage. An unusual type of cell was noted in the marrow by Thomsen and Plum (1939) and Stephens (1935) and in the present case. It has been described as a "stem" cell by Thomsen and Plum (1939), who state that it does not resemble a leukæmia cell or a normal marrow cell, and describe it as having a sharply defined and deeply staining nucleus and a poorly defined cytoplasm with minute blue granules at the periphery. Stephens (1935) calls it a "blast" cell. with a nucleus paler than a myeloblast and a faintly basophilic cytoplasm with no granulation. In our case it was about as large as a myeloblast, the nucleus was sharply defined and stained less deeply than the blast cell, the cytoplasmic rim was faintly basophilic, there was an indentation at one pole and there were a few large coarse mixed eosinophil and basophil granules. In the two cases published by Thomsen and Plum (1939) and Stephens (1935) the cells were seen in a terminal myeloblastic phase of the disease, and in our case during the chronic stage. Possibly the different descriptions are due to different stages of maturity.

Infiltration.—Death in eosinophilic leukæmia is due to infiltration by the adult leucocyte of organs essential to life, particularly the myocardium. Though the eosinophil is usually referred to as a tissue-fluid leucocyte, its power of infiltration in the adult form does not seem to be fully appreciated. This power of infiltration has been shown in both eosinophilic leukæmia and familial eosinophilia, and therefore seems to be distinctive of the cell, suggesting that it has primarily a tissue function; whether this is a "detoxication" or not is hardly germane to the present discussion. The extent of the infiltration seems to depend on the degree of the leucocytosis and its duration; that the infiltrative capacity of the eosinophil is of general importance is suggested by a case reported by Barrie and Anderson (1948), who describe pyloric hypertrophy due to massive eosinophilic infiltration in a patient with persistent eosinophilic leucocytosis. They conclude that the appearance of the pylorus was due to an organic intestinal allergic reaction; the possibility that it might have been secondary to familial eosinophilia, or even an eosinophilic leukæmia, was not considered. Up to now these two forms of eosinophilia have been classed as a hæmatological curiosity, but familial eosinophilia may be more widespread than is suspected, and its presence may be a more rational explanation for some of the focal lesions hitherto described. The release of relatively large amounts of histamine set free by the death of the eosinophils may explain the localised areas of necrosis which so often accompany focal infiltration by eosinophils.

Allergy.—Whether the allergic reactions commonly noted in familial eosinophilia are coincidental with, causes of, or caused by the eosinophilia is difficult to decide. Their incidence is too great for coincidence to be a plausible explanation; and, if inherited sensitivity was the cause of familial eosinophilia, one would expect the condition to be much commoner than it is. It therefore seems more reasonable to conclude that the existence and death of a large number of eosinophils in the body may be responsible for the allergic manifestations, which are an expression of systemic histamine activity. This point raises the question of eosinophilic leucocytosis in allergy. In view of the many cases of allergy seen, and the relative paucity of counts showing much eosinophilia, we suggest that, where allergy coexists with a high degree of eosinophilia, other members of the family should be investigated for familial eosinophilia. Possibly a separate class of " allergics " exists who are such because of their blood condition and not because of any sensitivity to bacteria, dust, or pollen.

SUMMARY

A case of eosinophilic leukæmia and one of familial eosinophilia are described, and previously published cases reviewed.

The evidence suggests that eosinophilic leukæmia is an entity.

Attention is drawn to the infiltrative power of the adult eosinophil.

The relation of allergy to familial eosinophilia is discussed.

We acknowledge gratefully the help of Dr. A. Doyne Bell, under whose care both patients were admitted.

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DEOXYCORTONE ACETATE AND ASCORBIC ACID IN THE TREATMENT OF RHEUMATOID ARTHRITIS

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Lewin and Wassén [1] report that the combined injection of deoxycortone acetate and ascorbic acid caused temporary improvement in cases of rheumatoid arthritis. Our object here is simply to state that we have been able to confirm these results in a considerable proportion of cases. Further work is proceeding on the mode of action of these substances and the physiological changes they produce and will be reported in due course. We have studied 23 cases, using the recommended dosage of 5 mg. of deoxycortone intramuscularly followed within five minutes by 1 g. of ascorbic acid given intravenously, and these are grouped below according as to whether there was a striking response, an improvement, or a failure to react favourably at all.

STRIKING RESPONSE

CASE 1.—A woman of 34 with polyarthritis of five years' standing and the left shoulder restricted to a painful limit of 150° in abduction acquired a full free painless arc within ten minutes. The improvement was maintained for seven hours, and control injections with water the next day failed to elicit any response, much to the patient's disappointment.

CASE 2.—A woman of 38 with polyarthritis of three years' standing. Fifteen minutes after injection she was able to close one fist for the first time in seven months, there was a great increase in excursion of the wrists with disappearance of forearm spasm, and the left knee bent easily into full flexion, an increase of 20°. *All pain went, the* generally relaxed, and this improvement lasted for The same effect was reproduced two days later, but day an injection of ascorbic acid + saline gave only improvement which she found disappointing. The effect was reproduced with deoxycortone + as after two days.

CASE 3.—A woman of 56 with polyarthritis of twelve standing, in great pain, with many tender joints, and to walk without assistance. Two hours after injectio could walk unaided, all pain had gone, and both fists be closed for the first time for nine months. T lasted twenty-four hours. Four days later the initial was reproduced, but after another three days a injection of saline + saline gave no obvious improve Some improvement persisted in this case; the swelling ulnar deviation of the metacarpophalangeal joints hand cleared up and she was able to get her shoes on for the first time in six months.

CASE 4.—A woman of 44 with quiescent arthritis in joints and a warm swollen foot and ankle in which movement was prevented by pain and spasm. Afte minutes a full painless range was obtained and main for several hours, and the swelling decreased. The considerable subjective improvement and the gait was

CASE 5.—A rather obtuse and sceptical working m 60 with quiescent polyarthritis and a right shoulder rest by pain and spasm to 140° of abduction. Improv began fifteen minutes after injection and in two hours was an enormous subjective change. He felt "as joints had been well oiled," there was a complete easy at the shoulder, and there was an obvious ease of mo in the wrists and loss of forearm spasm.

CASE 6.—A man of 45 with polyarthritis and shoulders grossly limited in abduction and rotation relieved of pain within an hour and acquired almo rotation and greatly increased abduction movement.

IMPROVED

CASES 7–21.—All of these lost some pain and some completely relieved, there was lessening or disappearan spasm, and in some cases measurable increase in movement. These cases include a boy with Still's d and a [illegible] thritis. One woman wh had a [illegible] response lasting twent hours then developed a painful exacerbation lastin three days.

FAILURES

CASE 22.—A man of 55 with polyarthritis of ten standing.

CASE 23.—A man of 26 with quiescent ankylosing sp litis of four years' duration.

DISCUSSION

The natural history of rheumatoid arthritis has been fully studied owing to the practical difficul following cases over the long and variable cour the disease without giving any treatment. The g view, however, is that 25% of cases undergo sponta recovery, 50% improve, and 25% deteriorate de treatment.[2] To prove beyond any possible doub value of a treatment it is necessary to watch a series of cases over a period with careful control to establish a significantly better improvement ra the treated cases. But in our experience, and we be the experience is general, although the disease may a comparatively sudden onset, it never undergoes a sudden improvement as we have witnessed, in cases within a few hours or even minutes of inje of deoxycortone and ascorbic acid. We know instance where such rapid loss of pain and joint tende and increase in range and ease of movement have occ either spontaneously or after any form of treat If it be shown that such changes occur after injections a very remarkable fact has been establi and with such a dramatic effect it does not need a series of controls to establish this fact.

We have taken the following features as criter improvement.

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[1] Lewin, E., Wassén, E. *Lancet*, Nov. 26, p. 993.

[2] A Primer of Arthritis: Committee of American Rheum Association, 1942.

e subjective impressions of the patient.—These, though ition not to be objectively assessed, are equally not nored. Of our 23 patients 21 felt better in them- the result of a general feeling of well-being plus a or complete loss of local pain and spasm. Several became obviously relaxed and at ease.

e relief of pain, both on the patient's statement and observations during passive movement of affected

ening of spasm.—This is best appreciated if the r moves the wrist-joint with one hand, keeping ers of his other hand resting on the volar surface of the s forearm. The relaxation of the wrist flexors after n was frequently noted, and even with cold wrists h there were fixed obstacles to motion at the extremes ited range the same range was now traversed without or apprehension. In the better cases it was notable ns of gross underlying pathological changes, in the of grating and crepitus, which had previously been appeared for the first time.

provement of joint movement includes an increase in ed range, a greater ease of motion, a loss of apprehension ing, and, in 3 cases, the overcoming of a resistance houlder motion which had been present for several years.

are satisfied from these early observations that on of deoxycortone acetate and ascorbic acid temporary clinical improvement in a considerable tion of cases of rheumatoid arthritis. This improve- was dramatic in only 6 of our 23 patients, and the observer of a series which did not include such cases might fail to notice instances of slighter improvement. We refer to what appears to be a specific pattern of response indicated by increased ease and comfort in active and passive movement, the decrease of regional pain and spasm, and an indefinable but genuine improvement in the patient's sense of well-being. We noted in case 2 that if deoxycortone + ascorbic acid gave a good result on one day, ascorbic acid + saline might give a moderate improvement the next day, and we feel that enough of the deoxycortone may linger for a day or two to enable this to happen, so that a longer interval is desirable between control injections.

SUMMARY

23 cases of polyarthritis, mostly instances of rheumatoid arthritis, have been treated with deoxycortone acetate and ascorbic acid injections. 6 of these exhibited rapid striking improvement lasting several hours, 15 were temporarily improved, and 2 failed to respond. We regard these findings as substantiating the claims of Lewin and Wassén that these substances given in conjunction exert a beneficial action in some cases of rheumatoid arthritis.

Six of the patients were seen at the Kensington Institute of Rheumatic Diseases through the kindness of Dr. Kenneth Stone.

Medical Societies

ROYAL SOCIETY OF MEDICINE

stroduodenal Hæmorrhage as a Surgical *Emergency*

surgical section of the Royal Society of Medicine n Dec. 7, under the chairmanship of Mr. DIGBY BERLAIN, president of the section, to discuss duodenal hæmorrhage as a surgical emergency.

A. H. DOUTHWAITE said that such hæmorrhage ited one of the most difficult and terrible problems dicine; it could not be solved by laying down atic rules. He proposed to confine himself to onsideration of peptic ulceration, but there were important points in the differential diagnosis.

hosis of the liver might be difficult to diagnose. ic indigestion was quite commonly associated with nd the liver and spleen were not always palpable, ally since the spleen shrinks with hæmorrhage. -function tests were unreliable in an exsanguinated it. In some cases peptic ulcer complicated cirrhosis result of the gastritis which was usually associated it. Chronic nephritis with uræmia was another e of trouble. The urine might not contain albumin ery case, but the patient was drowsy, and the le, in clear contrast with cases of peptic ulceration. dirty. The heart was enlarged and the blood- was always over 100 mg. per 100 ml. Two other tions to remember were pulmonary tuberculosis, might be complicated by acute gastric ulcer, and tension; but this last was a quite uncommon e of bleeding from the stomach.

ferent figures and opinions about the results of tment were difficult to compare because so much nded on the criterion of severity. The hæmoglobin entage might be used, but it was *unreliable*; *if the* ing on admission was 50% or more and the patient not become restless or the pulse-rate rise, or if no e red stools were passed, Dr. Douthwaite adopted ical treatment, and in a series of 35 cases managed this way only 1 had died. Treatment consisted in administration of fluids, blood-transfusion if the moglobin fell below 40%, and rest. He believed in rphine, but it sometimes had undesirable side- ects such as vomiting and pyloric spasm, and he refore combined it with papaverine gr. 2 and phenobarbitone gr. 3, all given together by intramuscular injection—somewhat of a blunderbuss, but effective.

Dr. Douthwaite thought it impossible to decide which patients would continue to bleed and which would not. He had treated 7 patients with a hæmoglobin of 30% or less. They had been cold, sweating, and mentally confused; the blood-pressure had usually been under 70 mm. Hg. 6 of them had died directly as the result of hæmorrhage, despite transfusion: the 1 who survived was aged 35. 6 similar cases operated on had all died, 4 of them on the table. The mechanical and technical difficulties of stopping the bleeding by surgical methods were very great. He had come to believe that in cases with a hæmoglobin of 50% in which the pulse-rate rose or there was a further fall of hæmoglobin, surgical treatment should be given without any further delay. Only so could surgical results improve.

If a patient with a chronic ulcer had bled and recovered on two occasions, operation should be done in a quiescent interval. The ulcer was likely to be chronic in 90% of cases; but it was not always easy to be sure. This difficulty was often due to the unreliable history given by patients of poor intelligence. If a chronic ulcer was shown radiologically in a patient aged 55 or more who suffered from arteriosclerosis, operation was indicated after only one hæmorrhage.

One cause of surgical failures was the poor general condition of patients with chronic ulcer. They sometimes developed serious deficiencies in their plasma-proteins which gravely undermined their resistance to the strain of operation. Curare was a dangerous drug not only in emergency operations for hæmorrhage but also in elective gastric operations.

Mr. NORMAN TANNER said that gastroduodenal bleeding as a surgical emergency resolved itself into three problems: (1) for which lesions is surgery indicated? (2) when is surgery required? (3) what surgical technique is appropriate? At St. James' Hospital between 1941 and 1949 there had been 836 cases of gastroduodenal hæmorrhage, constituted as follows:

Gastric ulcer	364	Simple gastric neoplasm ..	5
Duodenal ulcer	258	Gastric diverticulum.. ..	1
Anastomotic ulcer ..	40	Pancreatitis	2
Œsophageal ulcer.. ..	2	Carcinoma of pancreas ..	2
Gastritis	53	Aneurysm of aorta	1
Carcinoma of stomach ..	29	Uræmia (chronic nephritis)	1
Portal hypertension ..	31	Uncertain, duodenal diverticulum, &c.	44
Hiatal hernia	3		

The first five causes might be grouped together since they present with similar histories so that preoperative differential diagnosis is uncertain and the treatment is similar. Surgery must play a most important part in the treatment of this group. In carcinoma of the stomach the bleeding usually ceased spontaneously unless the growth was inoperable. Portal hypertension was best treated medically in the first instance, and in some cases the bleeding might be checked by direct pressure on the œsophageal varices produced by the balloon of an adapted Miller-Abbott tube (Rowntree's method). But in some cases emergency surgery was needed.

In solving the problem of when surgery was required, three possible courses were open to the clinician.

1. He might treat all cases medically except those which were certain to die without operation. No patient who would have recovered naturally would lose his life because of unnecessary surgical interference, but on the other hand some patients would die of bleeding while the physician made up his mind; and the majority of those who would have died under purely medical treatment would still die because surgery was too late.

2. The second course might be called selective surgical intervention and was the one most generally chosen nowadays. Medical treatment was given first, but the surgeon was called in for those cases which bled repeatedly or persistently.

3. The third course might be called the Finsterer method. Every patient with a chronic peptic ulcer who was admitted with severe hæmorrhage was operated on at once.

In order to test the efficiency of each of these three courses under constant conditions, Mr. Tanner arranged in 1941 for all cases of gastroduodenal hæmorrhage to be admitted to his own wards. A standard régime was laid down but from time to time the surgical policy was changed. The results were as follows:

	No. of cases	*Percentage over 60 yrs of age*	*Percentage operated on*	*Over-all mortality %*
1941 to 1943: operation avoided as far as possible	193	33	5	10
December, 1943, to June, 1944: earlier operation, always gastrectomy	60	33	15	20
June, 1944, to December, 1947: operation early, simplest to stop bleeding	312	35	11	11
January, 1948, to September, 1949: "Finsterer"	183	42	60	7

Two special points about these figures were the high average age of the patients and the omission of the operative mortality. This was low, but it was omitted because the over-all mortality was the more important. The operative mortality depended on the type of risk accepted.

The problem of surgical technique concerned mainly the peptic-ulcer group, but Mr. Tanner had devised an operation which he had used for œsophageal varices in quiescent intervals, and he suggested that it might be adapted as an emergency treatment for hæmorrhage. He called it "transgastric portocaval phlebotomy." Its object was to interrupt the collateral channels carrying blood from the high-pressure portal system up to the œsophageal veins, and thus to reduce the pressure in these veins to that of the caval system. It consisted in transecting the stomach (and with it all the vessels in its wall), dividing all the vasa brevia and the left gastric vein, and then re-anastomosing the stomach.

For bleeding peptic ulcer the operation of choice was gastrectomy, provided that one was well acquainted with the operation and particularly with its difficulties in duodenal ulcer. For very large gastric ulcers in debilitated patients it was sometimes necessary to restrict the operation to a local attack on the ulcer itself, and for a time he had treated duodenal ulcer by opening the duodenum, closing the ulcer crater with deep sutures, and then closing the duodenum in way as to narrow it, finally making a gastroje He now, however, preferred gastrectomy for d ulcer. Before deciding at operation that bleeding due to gastritis, a most careful search must be for an ulcer, which sometimes might be very to find. If the search was finally negative, all arteries supplying the stomach were ligatured; even this would not stop the bleeding in every erosive gastritis, and when the bleeding from this was very severe gastrectomy should be done.

The early surgical treatment of gastroduodenal h rhage required that an experienced gastric surgeon continuously available, and there must be an enth team. Although they had improved their results they had undertaken more frequent surgery for rhage, he intended to revert for a time to selective intervention to see whether this improvement fortuitous. In any case there would remain one advantage in frequent surgery. When patients discharged on whom gastrectomy had been most of them were rid of their ulcer trouble for when they were discharged after a conservative many would return with bleeding and some would die

Mr. IVOR LEWIS thought that the managemen gastroduodenal hæmorrhage should be shared by physician and the surgeon, and the ideal combir was a keen young physician and a somewhat re surgeon. The surgeon should be careful to exch palpable tumour, an enlarged spleen, and a bl diathesis. Operation should be considered in all of peptic ulceration, aged over 40, with a h under 40%, especially if the bleeding was recurre persistent. It was difficult clinically to distin acute from chronic ulcers, and the preoperative diag could be expected to be correct in only about of cases. Frequent aspiration through a Ryle's was a good way of keeping a really close watch case, because the patient might not vomit the bloo collapse until an hour after the bleeding had st At operation the minimum requirements were to the bleeding vessel and to exclude it from the g juice. It was of fundamental importance to rec that bleeding from a peptic ulcer was seco hæmorrhage from a large vessel.

Mr. A. M. DESMOND described his experien St. James' Hospital with a series of cases of duodenal hæmorrhage; this included 45 cases peptic-ulcer group operated on with only 2 d In the selection of cases for operation, certain fe were unfavourable for medical treatment. Pa who had severe pain and vomiting before the bl started, those in whom the pain continued aft bleeding started, bleeding while the patient w hospital under treatment for peptic ulceration, an going through to the back, all suggested a serious nosis without operation. Emergency gastroscop of great help to a clear preoperative diagnosis.

Dr. AVERY JONES reviewed his experience i cases of gastroduodenal hæmorrhage with an o mortality in some years of between 6% and 7%. S had been used very little, but there was a small that did need operation: these were patients middle age who had repeated hæmorrhage. serious feature was the steady increase i average age of patients admitted with gastrodu hæmorrhage.

[illegible] Dr. DOUTHWAITE explained th as a serious feature b t stood the loss of blood

Mr. TANNER paid tribute to Dr. Avery Jones's adv of gastroscopy in hæmorrhage and said that i improved the rate of correct preoperative diagn St. James' Hospital from 65 to 85%.

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	Methyltestosterone B.P.	NEO-HOMBREOL (M)
PROGESTOGENIC	*Progesterone B.P.*	PROGESTIN
	Ethisterone B.P.	PROGESTORAL
ADRENAL CORTEX HORMONE	*Deoxycortone acetate B.P.*	DOCA
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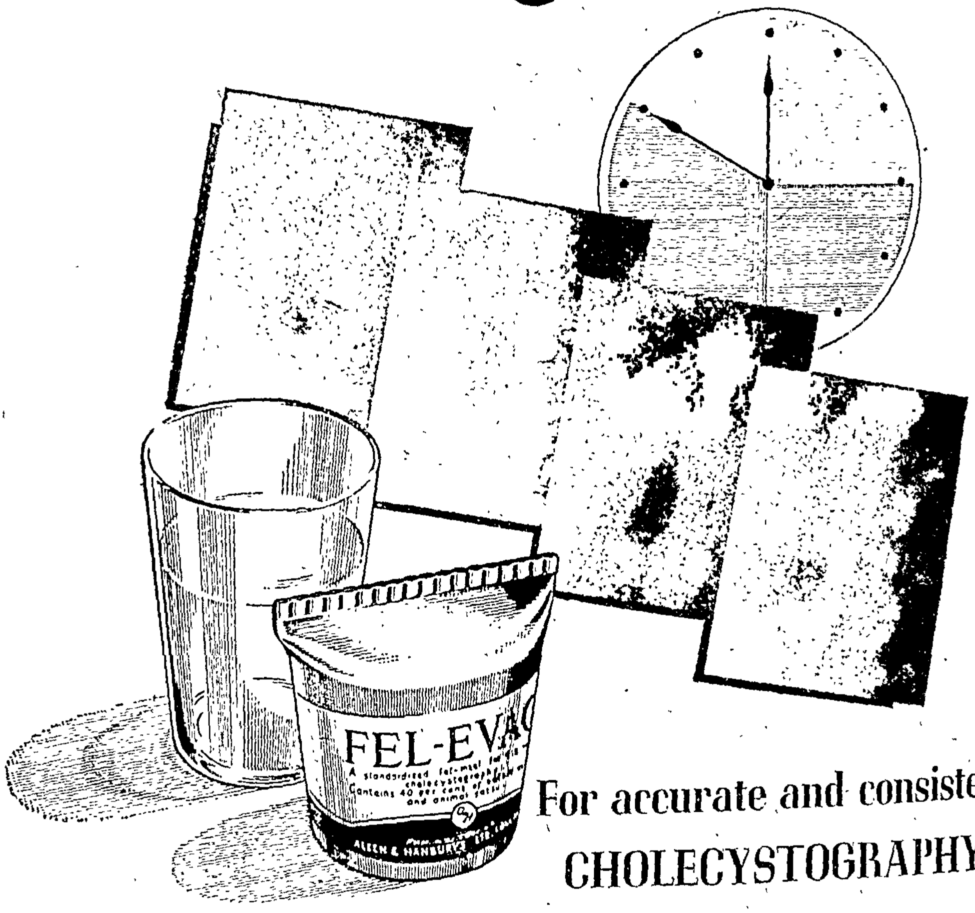

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THE LANCET

LONDON: SATURDAY, DEC. 17, 1949

Education and Practice

OGRESS has certainly been made in some of the tions indicated by the Goodenough Committee's rt in 1944. Contributing to a symposium on ical education,[1] Mr. L. FARRER-BROWN, who was etary of the committee, is able to show that ernment grants towards medical education have dily increased: in 1947–48 the medical schools ived from public funds about £2,500,000 more t before the war, and the promised figure for –52 is about £3,200,000, which will represent it £240 per student compared with the pre-war te of about £60. Though the committee has not red that all qualifying examinations shall be ternal" university examinations, its recomded abolition of the four remaining non-university lical schools has taken place. Its guidance has been largely followed over the appointment of f. There are now many more whole-time appointnts (senior, junior. and intermediate): whereas in 4. the undergraduate medical schools (excluding ord and Cambridge) had 11 whole-time clinical fessors, in 1948 they had 40, besides a few others were giving nearly all their time to their departnts in medical schools and teaching hospitals. ile the clinicians in charge of firms or clinics tinue to have full responsibility for the care of ients, they are expected to regard the professor ., of medicine or surgery) as the academic head of r department, responsible for the coördination of ching within the department and for its proper age with teaching in the other departments. In e schools, Mr. FARRER-BROWN says, the principle academic headship of departments has been cepted with reluctance and is not yet fully applied: t in the main it has been adopted more rapidly d widely than was generally expected five years ago. Advance can thus be recorded in what may be called e machinery of medical education. But are we yet ear on how the machinery should be used or even hat it is supposed to produce? Pointing out that me 60–75% of students become general practioners, Dr. P. J. MACLEOD agrees with the Goodnough Committee when it said that "the type of struction and the relative importance attached to various subjects should have a definite bias towards the needs of the future general practitioner." At present not only does the young doctor entering general practice find that he has to teach himself much of his difficult job. but he is wrongly oriented towards it: he probably feels guilty because he can no longer apply all the scientific methods possible in hospital. and because so much of his work is with the minor disorders which he has been taught to despise.

> "With such ill-preparation and with such an unpromising start," Dr. MACLEOD says, "it is a wonder how well most practitioners learn their work. Many don't. however. They leave off the scientific approach when they find it difficult or that it does not apply and take to the easy method of earning a living—sometimes with able tuition from a senior—by evasion, prevarication, and the glib tongue . . . The standard of medicine practised by some general practitioners is lower than that in any other profession and it is time the profession realised that fact."

Dr. J. H. F. BROTHERSTON argues that the real menace to the quality of practice today is neither the capitation fee nor the grossly inflated list of patients: "it is loss of a sense of pride in their work which seriously afflicts many men in general practice." For this the teachers bear some responsibility. During the student's impressionable years they may lead him to regard the social medicine of general practice as an inferior substitute for "real" medicine as practised in hospitals. And Dr. MACLEOD complains that later, when they meet him in general practice, they fail to realise that he has acquired knowledge which they lack. They are pleasantly condescending, and the practitioner, made freshly aware of his ignorance of a growing specialty, accepts the devaluation.

How is the student to get a proper training for general practice? Dr. BROTHERSTON rightly wants him to be taught some social medicine. "The gulf between hospital medicine and medicine outside is widening," he points out. "Yet the hospital remains the sole scene of medical training although there are many problems of individual and community health with which the hospital cannot deal." Dr. MACLEOD would like the student to see more of the beginnings of disease and have more practical experience in dealing with minor disorders: "most final year students can detail the stages of a gastroenterostomy but many of them have a very hazy idea only of how to incise a whitlow, or of what the drum looks like in an otitis media in a child." He would like every doctor after graduation to have a year's apprenticeship in practice; and this would at least ensure that the teachers of the future knew something about the work their students were going to do. Many believe that experienced general practitioners should give courses to students in their clinical years, either by coming into the teaching wards or by taking students with them on their rounds. The Cohen Committee[2] rejected both plans for what Prof. J. M. MACKINTOSH, editor of the symposium, describes as a "suspiciously large number of reasons."

Professor MACKINTOSH examines and contrasts the proposals of the Goodenough and Cohen Committees, from "premedical" education onwards. The Goodenough Committee thought that a good grounding in physics, chemistry, and biology at school should

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[1] *Universities Quart.* August, 1949, p. 737.

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Dr. J. H. F. Brotherston argues that the real menace to the quality of practice today is neither the capitation fee nor the grossly inflated list of patients: "it is loss of a sense of pride in their work which seriously afflicts many men in general practice." For this the teachers bear some responsibility. During the student's impressionable years they may lead him to regard the social medicine of general practice as an inferior substitute for "real" medicine as practised in hospitals. And Dr. Macleod complains that later, when they meet him in general practice, they fail to realise that he has acquired knowledge which they lack. They are pleasantly condescending, and the practitioner, made freshly aware of his ignorance of a growing specialty, accepts the devaluation.

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Professor Mackintosh examines and contrasts the proposals of the Goodenough and Cohen Committees, from "premedical" education onwards. The Goodenough Committee thought that a good grounding in physics, chemistry, and biology at school should relieve the student of any detailed study of these subjects at the university; the Cohen Committee, on the other hand, held that this would cramp the student's general education, and that these pre-medical subjects should be used to give him a training in scientific method, which is best done in a university atmosphere. Both committees, however, see the student as an almost non-stop learner. The Cohen report does allow him eight weeks' holiday during each of the three clinical years, and short breaks at Christmas and Easter, but his preclinical studies are to be crowded into fifteen months, with fifty-six weeks of study—four of them, Professor MACKINTOSH remarks, "blatantly stolen from the summer vacation." Under the Goodenough plan vacation courses are held, which worthy students will attend to their physical and mental detriment, while "the gayer and more casual worker will reap an undeserved advantage."

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[1] *Universities Quart.* August, 1949, p. 737.

[2] The Training of a Doctor. Report of the Medical Curriculum Committee of the British Medical Association, 1948.

> "The various committees have tended to regard the student too much in quantitative terms; they have been careful of his capacity as a holder-tank for learning. Or, in a more considerate way, the student has been regarded as an object whose health is to be promoted, who is to play games, and who is to be given the benefit of medical care when sick. All this is good, but the student is also a creature '. . . with such large discourse, looking before and after.' And each committee which reports on these matters has a plain duty to show how and when the student has time for eating, resting, reading, thinking, and playing. It would be nonsense to expect a timetable, but mere subtraction from a schedule of work is not good enough. The onus of showing time for other things rests on the committee that proposes a timetable of lectures and practical exercises. Here, for example, is a library—well-stocked, let us hope, for wide reading as well as for exact scientific reference; well lighted, comfortable, and spacious. When do the students have time (not merely snatched moments) to sit there, and read, and browse? At present they have far too little time to themselves, and even their spare evenings are clotted with hand-to-mouth medical fodder."

Dr. MACLEOD believes that the newly qualified doctor of today is a less developed man than his counterpart of a century ago, who had a larger experience of life and had learned his job in a more practical way: "the learning of an art gradually has been replaced by the rapid acquisition of a pseudo-science." The proposal in the draft Medical Bill (now awaiting Parliament's consideration), that a year of house-appointments before registration shall be compulsory for newly qualified doctors, will no doubt send them into practice better equipped, so far at least as hospital knowledge goes. But there is little sign that, even yet, the authorities have really come to grips with the question of what the student need not learn and why; and the curriculum, in prospect as well as in fact, remains ill-balanced, unwieldy, and poorly designed for its purpose. The contemporary student may be excused for feeling that between the various millstones he is being ground exceeding small, and it can be no satisfaction to him to know that having gone through the mill he will emerge only half-baked. As Professor MACKINTOSH says in conclusion, "it is pathetic to see that all committees demand . . . of candidates for medicine the very qualities which they are industriously stifling in the overcrowding of the medical curriculum—broad and humane qualities which will make the student a better doctor and a better citizen."

Tuberculous Patients' Washing

MOST hospitals and sanatoria make careful a
ments about the sterilisation of hospital bedd
linen used by patients with open tuberculos
give some thought to the protection of the
or other staff who have to handle it. If the
coughs carelessly, his counterpane and blank
be liberally sprayed with bacilli: and; as the
dries, bacilli will be left on the surface
coverings, to be disseminated into the air w
the bedding is shaken. It might be wise ther
require all nurses to wear masks and glov
bedmaking, and indeed this is a rule in son
toria. Opinions differ about the value
methods, but it is a sound principle to avoid
contact with infected material, and these pre
are easy to take. They might also be appli
linen is being sorted and counted before be
to the hospital laundry. Perhaps it would
more sensible to give up entirely the pra
sorting and counting laundry in the wards.
London Hospital all soiled linen goes dir
the laundry uncounted, and all clean linen i
from a central pool of numbered stock whi
constant circulation. Checking is managed b
the numbers on articles as they pass thro
central pool, and no counting is done at all.[1]

The personal laundry of patients offers
different problem. The hospitals do not unde
and ordinarily the patient's friends take the
home and return it clean. For the tubercu
question of washing handkerchiefs arises, si
sanatoria supply paper handkerchiefs, and
or 'Cellophane' bag into which they can be
An orderly collects the filled bags and puts
the hospital incinerator—a thoroughly clea
satisfactory system. Some hospitals provid
handkerchiefs; each patient keeps the hand
in a beaker on his locker, and at appropriate
an orderly goes round with a bucket of disi
into which patients drop their handkerchiefs,
are then sterilised and laundered by the
The containers, however, also need to b
destroyed or sterilised; and if they are not
tible they should be made of metal so t
can be sterilised with the sputum-cups.
plastic containers are unsuitable, because t
not be boiled and must be cleaned by the
The personal linen taken away for washing by
friends consists in the main of pyjamas, nig
bed-jackets, and possibly bedsocks or light
gowns. What the relatives and friends do wi
when they get them home is often left to th
judgment. An inquiry made by a patient'
among her neighbours in the waiting-hall of
sanatorium showed that some of them sent
ments straight to the laundry but more wash
at home: some kept them separate from the
the family wash, some soaked them in disi
before washing them, and some said they
enough soap to wash them separately.

How much risk is there in these various pra
It is hard to say. Many chest physicians now
that tuberculosis is seldom if ever carried by p

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[1] See *Lancet*, Oct. 29, p. 803.

ng. Some years ago the Registrar-General,[2] aching the problem from another direction. ed that in male laundry workers the standard ality-ratio from tuberculosis is low (70) and that omen over thirty-four it is not significantly high but that in young women below that age it es 151; so the possibility of infection from lry handling cannot be ruled out. There ars, in fact, to be good grounds for a new and ugh bacteriological research into the mode of mission of the human strain of tubercle bacillus. of existing knowledge is inadequate and is l on early unreliable experiments. Meanwhile ospitals and sanatoria the possibility that tion may be distributed via the patient's night- es should be considered; for we are not justified glecting any simple precaution. On occasion the ma jacket and the front of the nightgown may carry a heavy load of infection. The waking nt reclining in bed normally has his arms outside coverlet, with the bedclothes drawn up to about nipple line. When he coughs, then, the front of nightwear is as liable as the bedclothes to receive ay of micro-organisms. This garment is later rolled and handed to the relative, who often tucks it the family shopping bag. When she gets it home may stuff it into the family clothes basket: or e it rolled up on the kitchen table while she cuts bread for tea: or shake it out—possibly over family butter and jam—to see whether it needs ding; or stop to rub the baby's sore gums with finger while she is in the act of darning it: or ny number of other natural but unhygienic things ch may introduce risk. Some hospitals warn of these risks: most it seems do not. Some see t the washing is handed over to her in a paper and give her a printed list of directions about hing it: some give her no advice at all. So far ur knowledge goes, no hospital at present arranges terilise such clothing before it leaves the premises. it would surely not be difficult to provide calico s, marked with the patient's name, which would e all his soiled linen, and which could go through autoclave once a week, on the eve of visiting- . This measure would presumably end the s at one stroke: but if for some reason it is of the question the clothing should be handed r in strong paper containers, and relatives should given some simple rules for dealing with it.

High Thoracic Œsophagectomy

THE rapid development of the surgery of œsophageal er in the last ten years has been bound up with o measures: free transpleural resection, and imme- ate restoration of continuity. This phase dates om ADAMS and PHEMISTER's[3] operation of 1938, hich became the standard procedure for cancer of e cardia. This involved left thoracotomy, trans- renic resection of the growth, and mobilisation of e stomach, bringing up the remainder thereof to e anastomosed to the œsophageal stump. Recently urgeons have improved the approach in this opera- ion, by adopting an abdominothoracic incision such s was used by the Japanese surgeon OHSAWA in 1933. The technical problem of growths of the middle third was solved five years later, in America by SWEET,[4] using a left thoracotomy and a supra-aortic anastomosis, and in this country by IVOR LEWIS,[5] who favoured the approach through the right pleura and a separate epigastric incision. Both these surgeons pointed out that the stomach, carefully mobilised, would reach the dome of the pleura, allowing a high anastomosis free from tension. Thus it came about that the Torek œsophagectomy, never satisfactory as a palliative operation, was almost given up. But this must be said for the Torek operation: it did not tempt the surgeon to conserve more than he should of the proximal œsophagus—a sin often committed by the anastomers-at-all-cost.

Growths of the cervical œsophagus are mostly postcricoid, and these have been treated on different lines. As long ago as 1886 MIKULICZ reported a case of postcricoid carcinoma where he had not only done a resection but had successfully restored continuity by means of a skin tube. This method was later perfected by TROTTER, but its general adoption was checked by the advent of radiotherapy, which is effective in many of these comparatively superficial growths. There remains, however, a stretch of œsophagus in the thoracic inlet and the superior mediastinum—from about an inch above the manubrium to the angle of Ludwig—where it seemed that these two principles of modern œsophagectomy were impossible to apply. This no-man's-land lies opposite the 1st, 2nd, 3rd, and 4th dorsal vertebræ. Fortunately these growths above the aortic arch are uncommon. A Torek operation, even if desirable, is difficult owing to the shortness of the œsophageal stump. "The difficult we do at once: the impossible may take a little longer." It was obviously only a matter of time before the boldness of the surgeons, combined with what may be called the far-reaching qualities of the stomach, solved this problem too. Both SWEET[6] and GARLOCK[7] reported cases in 1948 in which they had been able to resect such a growth, bring the stomach the whole way through the thorax into the neck, and there anastomose the fundus to the stump of the œsophagus. Several other successes with this procedure have been reported since—by WYLIE and FRAZELL,[8] LYMAN BREWER,[9] and RUDOLPH NISSEN[10] in carcinoma; by SWEET[11] in a case of congenital atresia; and by TAYLOR and CLAGETT[12] of the Mayo Clinic in a boy with lye strictures. Besides the awkwardness of the approach to this region, which is reasonably accessible neither from the neck nor from the thorax, there is also the problem of the restoration of alimentary continuity which has baffled generations of surgeons. The great number of techniques described for the construction of an antethoracic gullet is eloquent testimony to their difficulty and uncertainty. The anatomical difficulties are enhanced by the fact that the thoracic inlet is tightly packed with important structures leaving little room to spare within its bony ring. Two elusive but important structures which are hardly ever injured in œsophagectomy lower down are the thoracic duct and recurrent nerves. In resection of growths, unnoticed division of the duct or damage to both recurrent nerves is likely to prove fatal. At this level the vagus trunks must also be respected.

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[2] Registrar-General: Decennial Supplement, England and Wale 1931, part IIa.
[3] Adams, W. E., Phemister, D. B. *J. thorac. Surg.* 1938, 7, 621.
[4] Sweet, R. H. *Ann. Surg.* 1946, 124, 653
[5] Lewis, I. *Brit. J. Surg.* 1946, 34, 18.
[6] Sweet, R. H. *Surgery*, 1948, 24, 929
[7] Garlock, J. *Ibid*, p. 1.
[8] Wylie, R. H., Frazell, E. L. *Ann. Surg.* 1949, 130, 1.
[9] Brewer, L. *Ibid*, p. 9.
[10] Nissen, R. *Ibid*, p. 21.
[11] Sweet, R. H. *Ibid*, 1948, 127, 757.
[12] Taylor, E. R., Clagett, E. T. *Proc. Mayo Clin.* 1949, 24, 473.

The steps of the operation, say for a growth at the level of D2, opposite the jugular notch, are three. It is a good plan to begin by exploring the neck through a long incision along the anterior margin of the left sternomastoid, continued for an inch or more down the front of the manubrium. The œsophagus is isolated and the finger passed down into the thorax between it and the longus colli. If the growth is found to be operable, the inner third of the clavicle and anterior half of the first rib are resected. The patient is then turned on his right side and re-draped for the second stage. A left thoracotomy is done. The diaphragm is divided and the stomach mobilised, carefully preserving the right gastric and right gastro-epiploic vessels. The left gastric branches are divided close to the stomach. This allows the stomach to stretch into a long straight tube. The œsophagus is cut off at its lower end and the cardia is closed. The second part of the duodenum is mobilised. It will now be found that the antrum will come up to the diaphragm and the fundus of the stomach reach the dome of the pleura. The arch of the aorta is mobilised, and the œsophagus, with its growth, is freed and passed up through the cervical wound. The fundus of the stomach is fastened just below the dome of the pleura so as to be readily secured from above. The chest is then closed and the patient again placed on his back for stage three. The neck wound is opened. The thoracic œsophagus is delivered and the fundus of the stomach brought up into the neck and secured to the prevertebral fascia. The œsophagus is resected, and an end-to-side œsophagogastrostomy done just below the cricoid. The following are important: to preserve the cricopharyngeus; to avoid damage to recurrent nerves and thoracic duct; judiciously to divide the left gastric branches so as to allow maximum stretching of the stomach while yet not devascularising any area of the fundus; and, finally, so to place the sutures in the prevertebral fascia that they hitch the stomach well up and prevent any pull on the anastomosis itself. Postoperatively, trouble may be expected from shock, bronchi [illegible] and regurgitation of food. In some cases [illegible] has caused attacks of coughing and cyanosis—doubtless due to postoperative œdema of the stomach incarcerated in the neck—and it seems sounder always to remove lengths of rib and clavicle.

These resections are undertakings of great magnitude, bound to have a considerable mortality. The operation time in one of the cases reported was $6\frac{1}{2}$ hours, and in another $9\frac{1}{2}$ hours. With regard to the operation itself, it may well be that the right pleural route would be better than the left, though needing three incisions. The indications for the procedure are cancer, and possibly some cases of benign stricture. With regard to the cancers several considerations arise. Postcricoid carcinoma should be treated either by radiotherapy or by resection with local œsophagoplasty—a method recently revived by Wookey. Cervical œsophagogastrostomy should not be done for these; it is more hazardous and no more radical than local resection, and it is unsatisfactory if the pharyngeus is not preserved, for peptic ulcer occur not only on the stoma but on the pha wall. Postcricoid carcinoma lies opposite C6. C at the level of C7 also will not allow an margin above if the pharyngeal pinchcock is to preserved. For some of these growths—especi really operable early ones—the pedicled ski operation suggested by Bricker et al.[13] may be answer. Their plan has the advantage that surgeon's energies at the first operation are trated on the thorough dissection of the area. It must not be forgotten however that growths may respond to radiotherapy, and where is the case the result is likely to be at least as good that of a limited dissection by the surgeon. The of this procedure for simple strictures requi consideration. In the first place, it is difficult disciples of Chevalier Jackson or of Grey T to believe that there are many simple strictures will not finally respond to skill and patience in tion. Time does not press and so the various me of antethoracic œsophagoplasty have a place—notabl the jejunal method of Yudin. The use of jejunu with or without a skin bridge would seem a sound undertaking for the few simple strictures whic cannot be satisfactorily dilated. In simple strictu the cervical œsophagogastrostomy enthusiast mu show that the operation can be done with reasonabl risk. He still has to convince us that it was reall necessary, and that, having been done, it is satisfactory

Annotations

RESUSCITATION IN RESPIRATORY ARREST

Sooner or later most practising doctors are fac with a case of respiratory arrest, or "respiro-cardi crisis,"[14] in which the patient's life depends on ho quickly proper treatment is applied. These cases a by no means limited to the operating-theatre and th orbit of the anæsthetist; so diverse are the causes o asphyxia that the patient requiring immediate resuscita tion may be a newborn baby in the delivery-room, housewife in her home, a workman in the factory, child on the river-bank, or a motorist in his garage o on the roads. In the United States a group of physician anæsthetists, and others have formed a Society for th Prevention of Asphyxial Deaths,[15] to disseminate kno ledge of the hazards and treatment of asphyxia. Th it is apparently not uncommon for laymen, such as police or the fire force, to be called on when resuscita is needed, rather than a medical man, even when th patient is inside a hospital. Such a practice may b unknown in England, but that there is a need here to for education in the prevention and treatment of the emergencies has been convincingly shown by Macintosh. He describes with welcome bluntness and clarity th number and variety of circumstances in which lives a needlessly lost in connexion with anæsthesia alon His article is a challenge to teachers of anæsthetics an hospital administrators, for nearly all the deaths a due to [illegible] during the administratio [illegible] are in the recovery perio of an a[illegible] Professor Macintosh's advice should be studied by eve newly qualified doctor before starting his first hous appointment.

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13. Bricker, E. M., Burford, T. H., Eiseman, B. *J. thorac. S* 1949, 18, 301.
14. Courville, C. B. *Medicine, Baltimore*, 1936, 15, 129.
15. Flagg, P. J. Art of Resuscitation, New York, 1944, p. 13.
16. Macintosh, R. R. *Brit. J. Anæsth.* 1949, 21, 107.

e vast literature on resuscitation dates from Biblical
[17] A recent comprehensive survey[18] emphasises
more the basic requirement of artificial respiration
rhythmic passage of fresh air or oxygen down the
structed respiratory tract to the alveoli. There are
at many methods of artificial respiration—over a
red have been listed[19]—and although the pul-
ry ventilation attained varies widely between
direct inflation of the lungs on the one hand and
ster's method on the other, in an emergency it
not matter which method is used,[20] so long as some
ets in and out of the alveoli. While the heart is
beating, artificial respiration must be continued
the patient breathes by himself. The person
ing it out should curb his vigour, for overmuch
ity on his part may delay spontaneous breathing
ducing a temporary acapnia. Once the heart has
ped it must be restarted within a few minutes or
ersible changes will occur in the cerebrum. Cardiac
age offers the only reasonable hope of restarting a
ped heart, and when the circumstances are at all
ble this manœuvre should be begun without delay.
tions of one sort or another should be regarded
as hopeful expedients to be tried while preparations
being made for cardiac massage. Sometimes,
hen the heart is manipulated during intrathoracic
ations or an injection of adrenaline is given during
propane or chloroform anæsthesia, ventricular
llation may precede complete arrest; and the
llation may be stopped and normal rhythm restored
rompt intravascular—or, better still, intracardiac
ection of procaine. Otherwise, the injection most
to do good is one of adrenaline into the cavity of
auricle.

luel J. Flagg, founder of the Society for the Pre-
ion of Asphyxial Deaths, hopes to make every doctor
se that impending asphyxial death is "the supreme
of his life-saving skill as a physician."

HE RH HAPTEN AND ERYTHROBLASTOSIS

RECENT number of an American advertising
al, *What's New*[21] carried an article on the "Rh
en," and suggested that this substance, or some
ance with the properties of Rh hapten, had been
ined in a form suitable for clinical trial. In theory
hapten is that part of the immune body which,
her with complement, combines with the immune
ody and neutralises the properties of the antibody.
it has been known that erythroblastosis of infants
e to the presence in the maternal blood of anti-
es to factor Rh, it has been clear that if the appro-
e hapten could be obtained it could be used to remove
maternal antibody, and so perhaps prevent the
lopment of this hæmolytic disease of the newborn.
action of Rh antigen and hapten from erythrocyte
na was reported by Calvin et al.[22] early in 1946.
claimed that the Rh antigen was a lipoprotein
ined in the elinin portion of stroma extract. From
fraction they obtained an ether-soluble material
a higher content of Rh-inhibitory activity than the
nt substance, or the original red-cell stroma. In
Carter[23] reported that from an ether extract of
ositive red blood-cells she had prepared a crude
rial that would neutralise Rh antibody in vitro
was presumably Rh hapten. Price et al.[24] confirmed this report and stated that they had purified this crude extract and obtained a crystalline material which, when tested by complement-fixation with anti-D serum, was active in a dilution of 1 in 5000. Further purification, however, suggested that at least two different substances were present, possibly corresponding to different Rh subgroups. Later Carter[25] described a revised technique for preparing this Rh hapten and gave some details of clinical trials.

Carter started off with a large volume of pooled human red cells of any ABO group and comprising as many of the Rh subgroups as possible, except for Rh-negative (cde/cde) cells. After various chemical manipulations, a lipid substance was obtained that would inhibit Rh antibody in vitro and would fix complement in the presence of Rh antibody. Guineapigs were injected with Rh-positive cells and Rh antibodies appeared in their blood: when the hapten material was injected into these immunised guineapigs, a fall in the titre of Rh antibody occurred, and this fall was used as a rough assay of the activity of the hapten lipid. Methods were described for in-vitro assay of the hapten activity of the material that were claimed to be more accurate, and no difficulties with non-specific reactions were encountered. As expected, no substance with hapten activity could be prepared from Rh-negative (cde/cde) red blood-cells. The material was said to be relatively stable—it kept without deterioration for at least three months at room temperature—and so was readily available for clinical trial.

For clinical use, 100 mg. of the preparation was dissolved in 1 ml. of alcohol, suspended in 10 ml. sterile saline, and injected intramuscularly; no untoward reactions occurred. The material has been given in this manner to thirty women. Eight mothers with Rh antibodies present in their blood delivered completely normal babies, and in two cases the infants had mild erythroblastosis. Seven mothers were not delivered at the time of the report, but the titre of Rh antibodies in their serum had been reduced. Four children were lost; two were premature and did not survive, two died in utero; in these four mothers treatment was begun late. In eight further cases reports were incomplete, and in the remaining patient an attempt was being made to reduce the Rh antibody titre before a further pregnancy commenced. Loughrey and Carter[26] and others have tried the preparation for the treatment of infants affected with erythroblastosis. Twenty-seven infants were treated; twenty recovered and became normal and well, seven died—but in five of these death was due to some other complication. Of the twenty recoveries, only six needed blood-transfusion, and then a single transfusion of 100 ml. of whole blood sufficed. These results were obtained in clinically severe cases; if it was thought that the infant would recover spontaneously this form of treatment was not given.

Now it is known to all workers in this field that the preparation of an Rh hapten might well solve the problem of how to prevent the birth of an infant affected with erythroblastosis when the mother is known to have Rh antibodies present in the blood; and equally, it might be used for the treatment of the erythroblastosis in the infants themselves. Present methods of dealing with these syndromes are not very satisfactory and alternatives would be welcomed. The successful preparation of Rh hapten suitable for clinical use would therefore be news indeed. But, though the first announcement of the extraction of an Rh hapten was made in 1946, no confirmation of the claims of Carter and her colleagues has yet appeared. Mrs. Carter herself says of the clinical reports: "it is imperative that great conservatism

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Kings, IV, 34.
iggin, S. C., Saunders, P., Small, G. A. *New Engl. J. Med.* 1949, 241, 370, 413.
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rice, C. C., Read, D. H., Bardos, T. J., Chen, C. *J. Amer. chem. Soc.* 1948, 70, 3527.

[25] Carter, B. B. *J. Immunol.* 1949, 61, 79.
[26] Loughrey, J., Carter, B. B. *Amer. J. Obstet. Gynec.* 1948, 55, 1051.

be the state of mind when approaching this phase of the problem," and it has to be remembered that there are probably other factors, besides maternal sensitisation, that influence the prognosis of erythroblastosis. This silence is undoubtedly due to difficulties that have arisen in repeating Mrs. Carter's results. The chemical techniques used by her produce a mixture of blood lipids, and it may well be that substances that inhibit Rh agglutination are contained in this mixture; but that these extracts represent Rh hapten in a reasonably pure form seems unlikely. In view of its importance, we hope that those who have been trying to repeat Carter's work will soon publish their results, positive or negative. Meanwhile the treatment of erythroblastosis in infants must follow present lines.

TEMPORAL ARTERITIS

FIVE further examples of the condition now known as temporal arteritis have lately been described by Migone and Mortara[1] in Italy. The pattern of the disease ran true to type. During the prodromal phase, which may last from a few days to many months, the patient feels unwell and usually has a fever ranging between 99° and 103°F, joint pains, pains in the muscles, often with well-marked tenderness, night sweats, lassitude, and anorexia—a vague pyrexial illness with no obvious localising feature or characteristic change in the blood-count or blood picture to aid in diagnosis. In most patients the general symptoms are sooner or later overshadowed by more definite disturbances of special systems.

Headache, of a particularly severe and continuous type, is almost invariably present. It may be generalised or confined to the occipital or frontal regions. Its severity may be judged by the frequent necessity of large doses of morphine, which give only temporary relief. At this stage the temporal artery is felt as a thickened tender tortuous cord, and the overlying skin is reddened. Ocular and oculomotor manifestations were met with in 55% of the 121 cases analysed by Migone and Mortara. Direct spread from the temporal artery to the arteries of the optic nerve has been postulated as the basis for this high incidence, but Migone and Mortara prefer to ascribe the ocular complications to systemic dissemination. The visual disturbances range from blurring of the field of vision to actual blindness, which has occurred in 30 to 50% of reported cases. The oculomotor symptoms include transitory ptoses, dilatation of one pupil, or strabismus. Cerebral disturbances are frequent and are easily misconstrued. There may be hallucinations or transient disorientation, and delirium, sometimes leading rapidly to coma, may also occur. In patients in the sixth or seventh decades these may be dismissed as secondary to the general systemic disturbances and cerebral arteriosclerosis. It would therefore be wise to consider temporal arteritis as a possible diagnosis in any elderly patient with central nervous symptoms, especially when these are accompanied or preceded by a pyrexial phase. Coronary thrombosis or angina pectoris have been included in the symptom complex, and Kaye[2] has described in detail the onset of pericarditis with characteristic electrocardiograph changes during the pyrexial stage.

The Italian workers managed to obtain biopsy specimens of the temporal arteries in most of their patients. Their findings confirm those already accepted, though there is still dispute as to the exact site of the disease process in the arterial wall. They postulate a panarteritis, suggesting that it is difficult to prove that any particular coat bears the main brunt of the infection. Cooke suggest that the process starts subacutely in adventitia, spreading to involve the media and intima. Andersen[4] thinks that the initial lesion is tunica intima, and is proliferative in nature, the coats showing an exudative or chronic reaction with giant-cell formation. Certainly cells are commonly found, and in fact are said characteristic. The ætiology is still obscure. and Mortara could not identify any specific ætio agent in their cases, and this has been the c of other workers, even after the most exhaustive logical and cultural tests. Gordon and Thurber[5] that histologically periarteritis nodosa and te arteritis are identical, but this view has been di by Harrison.[6] The responses of the arterial injury, whether this is allergic or bacterial in are of course limited; so similarities in the path changes present in the two conditions do not sarily prove that a similar agency is responsible fo Biochemical tests of the plasma-protein level constant relative hypoalbuminæmia. The actual protein level may not be altered, for the plasma is correspondingly raised.[7] The significance change has not been explained, though it might for the raised erythrocyte-sedimentation rate w always present in the disease.

Temporal arteritis thus remains a clinical syndr unknown ætiology. The pathological changes are constant, though the histological picture seen in specimens will depend on the severity of the the site from which the specimen was taken, a stage the disease had reached at the time. The be little doubt that temporal arteritis is only a p larly prominent manifestation of a general disea one which may involve the veins and the a simultaneously or successively.

MECHANICAL HEART SOUNDS

A DEVICE for demonstrating heart sounds to st recently described by O'Farrell,[8] produces the artificially and synchronises them with an illum diagrammatic model of the heart cycle. It is c that "the construction and components of the app are simple and can be assembled in a well-equipped service station." The apparatus has the advantage of being readily portable. The two sounds are produced by two hinged metal ha striking separate drums, and murmurs are evok the friction of a smooth metal edge on fibro (e.g., bicycle brake-block). The murmurs are mitted separately to a narrow plank of wood c with cotton-wool and velveteen, to which the li students apply their stethoscopes. The visual consists of five mounted flash-lamp bulbs enclo boxes faced with coloured glass and marked sound," "second sound," and "presystolic," "sys and "diastolic" murmurs. These sound box "suitably placed over the 'murmur' boxes so indicate the interval between the sounds in the ventional graphic manner." Ten different combin of sounds can be produced.

This ingenious machine is said to be helpful t student with little clinical experience while he is stu pathological specimens of the heart, and also a next stage when he first starts using a stethosco hospital. Physiologists might find it useful in teaching of preclinical students.

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2. Kaye, S. L. *Lancet,* 1949, vi, 1039.
3. Cooke, W. T. et al. *Quart. J. Med.* 1946, 15, 47.
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6. Harrison, C. V. *J. clin. Path.* 1948, 1, 197.
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Points of View

RMY MEDICINE IN THE LATE WAR

SOME MISTAKES OF POLICY?

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1. Malaria

ny campaigns during the war, and particularly rma, malaria had a profound influence on the ions. According to Marriott (1945), the admission-o medical units serving the Burma Front was, in just under 1200 per 1000 troops per annum, and proportion of these casualties—up to 80% during d seasons of the year—were caused by malaria.

PREVENTION

best method of malaria control—destruction of sect vectors—was clearly inapplicable to the zones tual fighting. An infantry attack could not be led by the advance of a large anti-malaria squad ing D.D.T. and draining pools. Even in the base with the possible exception of certain large towns ld-standing military encampments, this method, h widely used, was only partially successful.

e military authorities, especially during the first ears of the campaign, pinned their faith largely to ndividual efforts of the soldier to prevent himself being bitten by mosquitoes. There were strict s that everyone should invariably sleep under squito-net, which should be put down before dusk, hat long sleeves and long trousers should always be during the hours of darkness. Every soldier was d—or should have been issued—with a tin or bottle osquito repellent, which he was ordered to smear l exposed parts of his person at two-hourly intervals dusk when not under a mosquito-net. Even the istance of the soldier being compelled to leave his y the call of nature was not overlooked: before g the net he was ordered to smear with repellent his ks and other parts which would be exposed.

t in spite of much propaganda these orders were ly ignored. The majority of soldiers doubtless slept arly under mosquito-nets, unless they were in the of the enemy, when this was impracticable. They kept their sleeves rolled down when under the eye of ority. But few attempts were made to enforce the hourly smearing with repellent: I was never in it in which this rule was observed. And there were soldiers who did not, when alone or in the company iends, habitually expose unanointed parts of their s after dusk. This slackness was common to all s and to all branches of the Service.

was argued by those responsible for malaria policy these widespread breaches of anti-malaria dis-e were a scandalous reflection on soldiers in general officers in particular, and that malaria would be vented only if the precautions were observed. But reasoning is futile. If regulations are so onerous t they are widely ignored in spite of intense efforts, blame should fall on the framers of the regulations, on those who have to carry them out. Even if every dier had obeyed his orders in respect of mosquito-e prevention to the letter, it seems highly doubtful ether the incidence of malaria would have been sensibly inished: for when mosquitoes are really numerous few bites are inevitable. This conclusion applies rticularly to front-line soldiers, who were preoccupied th the enemy and commonly had to fight in intensely alarious areas.

Prophylactic Mepacrine.—Though the Burma campaign began in 1942 with the Japanese advance to the frontiers of India, it was not until 1944 that mepacrine was continuously administered to troops, and some of the personnel of units in malarious areas did not have it till 1945. For generations a daily dose of quinine has been taken by many Europeans living in malarious countries, with the conviction that thereby malaria can be suppressed. Mepacrine was discovered in 1930 and its efficacy as a curative drug was soon demonstrated beyond question. Quinine supplies being largely cut off by the Japanese occupation of Java it must be wondered why prophylactic mepacrine was not introduced sooner in Burma.

DIAGNOSIS

From early in 1943 until the end of the war in Burma the methods of dealing with malaria were largely laid down by regulation. Perhaps the order which had the most far-reaching consequences was: "*every effort will be made to establish diagnosis by microscopic demonstration of malaria parasites before treatment is begun.*" This statement was qualified by such further statements as "this must not be allowed to delay urgently needed treatment," but it nevertheless appeared at the beginning of every edition of the regulations about malaria treatment, even after suppressive mepacrine (which, if malaria develops, increases the difficulties of finding the parasites) had come into general use. It was also stated that "*all attempts at microscopic diagnosis having failed,* should the clinical condition justify a diagnosis, treatment must not be withheld" (my italics).

Since regimental M.O.s were not provided with microscopes, this order, if obeyed, meant that every soldier with suspected malaria had to be admitted to a medical unit. Not only, therefore, were fighting soldiers in the face of the enemy evacuated (which may seem reasonable) but the sepoy in an I.E.M.E. maintenance unit alongside the Manipur Road and hundreds of miles from the nearest Jap, who had what seemed a typical malarial attack, could not just be given quinine or mepacrine, but instead had to go to a medical unit perhaps fifty or more miles away: and this meant that his unit might not see him again for weeks. (The same sepoy in his native village would, when ill with malaria, merely lie down for an hour or two and then proceed with tilling the land and have no further fever for a long time, owing to the immunity acquired by the repeated infections he suffered throughout life.)

A second consequence of the order was that the initiation of treatment was always delayed a little and often delayed for a long time. Many soldiers had several rigors, with all the unpleasant symptoms accompanying them, before they received drugs: and of those infected by virulent strains of *Plasmodium falciparum* no doubt a few died.

In December, 1944, when stationed with an Indian malaria forward treatment unit in the Kabaw valley, I made a special study of all the suspect malaria cases among the British other ranks who were patients at one particular time. Of sixty-nine cases, twenty-one had remained untreated (apart from the statutory mepacrine tablet daily) for 3–7 days before being admitted to the unit. This time had chiefly been spent in a main dressing-station, where repeated blood slides had been examined. The men were not very ill, and, as the evident result of their small daily dose of mepacrine, had only moderate degrees of fever. They all quickly recovered when given quinine and mepacrine in adequate quantities.

It must be wondered, then, why this order was ever made. The usual defence was that to treat patients before the diagnosis was certain was "unscientific." But even admitting this, it is not true that the finding of parasites in the blood-stream is always the best way to diagnose malaria. On the contrary, in the case of Indians and Africans (who together formed the great majority of the troops in Burma) the presence of malaria parasites by no means proved that their fever was malarial, for most members of those races have had malaria throughout their lives, and the parasites can commonly be found in their blood when they feel perfectly well. Even among British troops the presence of parasites did not prove that they had malaria alone. And the failure to find parasites, especially among British troops who had not previously had malaria, could not, by universal agreement, exclude the disease. On the other hand, a single brief high fever, preceded and followed by afebrile periods, could hardly be due to anything but malaria, and such fever occurring every second or third day provides evidence as near pathognomonic as any in the whole field of medicine. Here, indeed, is a good example of the extraordinary assumption, so commonly made now in the medical world, that the evidence of the laboratory is inevitably superior to the clinical evidence.

And the premise that there is something wrong or "unscientific" in giving treatment before the diagnosis is made is itself damnable. Diagnosis is not an end in itself but the means to an end. To give quinine or mepacrine to those who in fact are free of malaria cannot do them any possible harm, and to give the drugs as soon as the disease is suspect can only do good.

A further defence of the order was that if soldiers were wrongly started on anti-malaria treatment, they would unnecessarily be held in hospital, since the official scheme of treatment, until February, 1945, lasted 2 weeks. But this implied that it was in fact correct automatically to keep soldiers in hospital because they had had a malarial attack—a question to which I shall return.

A comparison between this order and a number of orders issued in connexion with certain other diseases is interesting. Thus, a memorandum of August, 1944, about scrub-typhus, said: "If a suspected or definite typhus case has come from a malarious area he must forthwith be given a full course of anti-malarial treatment *whether or not malarial parasites are found in his blood-stream.* Neglect of this precaution has resulted in deaths . . ." (my italics). In other memoranda it was laid down that all soldiers who had been wounded, who were admitted to hospital for ordinary surgical operations, or who had severe anæmia should be given anti-malaria treatment. Thus if a medical officer had the best clinical evidence for supposing that a man had malaria he was strongly discouraged from prescribing anti-malaria remedies; but if he knew that a man had one of these other conditions he was *compelled* to prescribe these remedies!

It was not surprising that this order was widely ignored. In many units officers and N.C.O.s were not evacuated when their regimental M.O. thought they had malaria, but were given quinine and mepacrine on the spot, even though the rank and file were disposed of through the correct channels.

A company commander of a field ambulance who had been in the 36th Division during the advance from Myitkina told me that of course his own personnel who developed malaria did not become casualties as they should have done. They were immediately given the drugs and as soon as their fever had subsided returned to duty. "If we had done otherwise," he said, "the unit would have become incapable of functioning and the evacuation arrangements would have broken down completely."

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TREATMENT

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ever short the period spent in hospital, and r efficient the machinery for returning men to nits, if soldiers were once evacuated there was during the mobile phases of the war in Burma, a long interval before they reached the Front The only way of avoiding this wastage was to en in their units; and if they developed malaria uld only be done by disobeying orders.

DISCUSSION

peans long resident in malarious countries, and e few well-to-do natives of those countries, have erations dealt with malaria very simply. On the mptoms of what they believe is an attack, they iately start a course of quinine. The hardier, ose with the mildest attacks, then continue with ork or play. For a worse attack they may retire with a bottle of whisky, a bottle of aspirins, and water bottle, and perhaps remain there for a few returning to work the following morning. If still next day they may summon the doctor, and y go into hospital for a few days. When such men the Army, they were astounded to discover that case of malaria was admitted to a medical unit eks.

e is nothing original, therefore, in suggesting oldiers with malaria should have been managed similar lines. Regimental M.O.s should have been instructions that whenever a soldier seemed to malaria, the exhibition of anti-malaria remedies commence immediately. Whenever practicable uld not be evacuated but retained in the unit. provided his fever had gone by next day, he return to his ordinary duties if he seemed well, not, to light duties for a day or two. Only if the persisted should he be evacuated.

h a scheme would not, perhaps, have been always able to troops in contact with the enemy, unless ymptoms were unusually trivial. But at any one he number of troops actually fighting was usually small; a high proportion even of the infantry not in action, while there were vast numbers of of communication troops who were never, except ident, near the Front.

y the authorities did not adopt a scheme along lines I was in no position to judge; but it is possible nk of various reasons.

t may be argued that soldiers live lives so arduous mparison with civilians that though it may be reasonable for the latter to return to work immey after they become afebrile for the first time rs require a further period before they are "fit" In fact a high proportion of soldiers do not as e live particularly arduous lives; and even infantrymay not do so for long periods at a time. Moreover, attacks of relapsing B.T. malaria (which formed the st proportion of the cases) if treated immediately o trivial that their victims seem perfectly well in y way within a very short time.

In the Army there is a tendency to regulate as h as possible by fixed drills designed to cover all ingencies. Now malaria in its M.T. form can be a most us, even fatal, disease; and those who are very ill it should obviously not be retained in their units. Therefore, since some should rightly be admitted to hospital, a rule making it inevitable that everyone should be so treated naturally follows. In a similar manner, since some soldiers should be in a high state of "fitness," a rule is made requiring that all should be in this same state. But admitting all that may be said in defence of this Army practice, any attempt to make fixed regulations for a disease so variable as malaria, affecting soldiers whose conditions of life differ so widely, is surely unjustified.

3. There might be parliamentary or press criticism if it was alleged that soldiers were sent back to duty too soon after attacks of malaria.

4. If soldiers were treated in the field by their regimental M.O.s, there could be no guarantee that they would receive their drugs regularly. This argument has some substance. Nevertheless, to ensure that all soldiers being treated for malaria attend a parade once daily (for the drugs could satisfactorily be given in a single dose) should rarely have been difficult, especially after the use of suppressive mepacrine became compulsory, for then everyone had to attend a daily parade for his tablet. And this procedure was certainly far more easy to carry out consistently than were the complex and irritating anti-malaria regulations which were officially compulsory for all.

5. Regimental M.O.s might misdiagnose other fevers as malaria. This may be so, but it would soon have become apparent that a diagnostic error had been made; and if the cases were then evacuated (perhaps one or two days after the start of their illness) it is most unlikely that harm would have been done.

6. If malaria were diagnosed clinically, the statistics as to the ætiology of fevers would have been wrong. But this assumes the wrong premise previously discussed—that the laboratory diagnosis of malaria is inevitably superior to the clinical. Moreover, many cases of malaria diagnosed clinically were deliberately given such labels as dengue or sandfly fever, because it was thought that Authority disliked the diagnosis "clinical malaria."

CONCLUSION

I believe the schemes for preventing and treating malaria in the Burma campaign were mistaken. It is widely supposed that, though at first malaria was a more serious enemy than the Japanese, in the end the tremendous efforts of the authorities, scotched, if they did not quite destroy, this enemy. The arguments here advanced suggest that, on the contrary, the delay in introducing suppressive mepacrine, the discouragement of the early exhibition of anti-malaria drugs, and the insistence on prolonged hospital care for each malaria case contributed to disastrous happenings in 1943 and 1944; and that suppressive mepacrine, the shorter hospitalisation, and the increase in forward medical units made the situation later not quite so bad. The regulation urging that soldiers should not be treated for malaria on clinical grounds was, I believe, particularly unsound.

2. Amœbiasis

NEXT to malaria, amœbiasis was probably the most serious medical problem in Burma. It was much less common than bacillary dysentery, but it was a greater menace because that disease is as a rule trivial and of short duration. According to Marriott (1945) it was "the most important single cause of protracted illness and invaliding" from the Burma theatre.

Amœbiasis is similar to malaria in its susceptibility to specific drugs and its tendency to relapse. But it does not consistently and rapidly respond to treatment in the same manner. And whereas the relapses of malaria tend to be both less serious and more susceptible to drugs than the first attack, the relapses of amœbiasis are usually worse and less susceptible. Commonly the and Africans (who together formed the great majority of *the troops in Burma) the presence of malaria parasites* by no means proved that their fever was malarial, for most members of those races have had malaria throughout their lives, and the parasites can commonly be found in their blood *when they feel perfectly well. Even among* British troops the presence of parasites did not prove that they had malaria alone. And the failure to find parasites, especially among British troops who had not previously had malaria, could not, by universal agreement, exclude the disease. On the other hand, a single brief high fever, preceded and followed by afebrile periods, could hardly be due to anything but malaria, and such fever *occurring every second or third day provides evidence* as near pathognomonic as any in the whole field of medicine. Here, indeed, is a good example of the extraordinary assumption, so commonly made now in the medical world, that the evidence of the laboratory is inevitably superior to the clinical evidence.

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A further defence of the order was that if soldiers were wrongly started on anti-malaria treatment, they would unnecessarily be held in hospital, since the official scheme of treatment, until February, 1945, lasted 2 weeks. But this implied that it was in fact correct automatically to keep soldiers in hospital because they had had a malarial attack—a question to which I shall return.

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other source of error caused by the excessive con- ation on the microscopic aspects of amœbiasis is the *E. histolytica* discovered in a man's stools may ecessarily be responsible for his symptoms—just alarial parasites may not be responsible for fever. aps vegetative forms of the organism are always d by active disease, but it has been widely thought any years that in countries where amœbiasis is mic a high proportion of the natives habitually the cystic forms, though free of all symptoms. that even in temperate countries such as England passers are by no means rare. Commonly, therefore. ers with alimentary symptoms due to another cause amœbiasis, or even those with vague complaints sychological origin. were given the recommended e of anti-amœbic remedies because of the coinci- al presence of *E. histolytica* cysts in their stools. situation is further complicated by the fact that may be considerable difficulty, even for the expert, ifferentiating *E. histolytica* cysts from other cysts only found in the bowel, as was recently emphasised ershaw (1946) and Hill (1947). It can hardly be ned that many soldiers in forward medical units in na, the laboratories of which were often staffed by y trained technicians, were wrongly considered to arbouring *E. histolytica* cysts.

TREATMENT

rhaps the most striking feature of the Army policy rds amœbiasis was the length of time it caused men emain *hors-de-combat*. For the ordinary case an SEA medical directive dated December, 1945, pre- ed emetine, emetine-bismuth-iodide (E.B.I.), and iofon-enema courses lasting about 17 days. This followed by 'Diodoquin,' if available, for 20 days, therwise acetarsol or similar compound for 12 days. r an interval of 2 weeks from the end of treatment. ls had to be examined microscopically for 6 consecu- days. Clearly, a man could not be returned to his in the forward areas for the 2 weeks' interval, gh he might sometimes spend this time in a con- scent depot. The total time, therefore, between nning treatment and being ready to return to duty ; if diodoquin was used, a minimum of 8 weeks and ay. This naturally meant that cases of amœbiasis ld not be treated in the forward areas, but had to be uated a long distance, probably to such places as illa in Bengal or Madras. Moreover, the treatment rarely started immediately after the soldier reported in the forward areas ; commonly there was a delay ays or weeks (which in many cases could be ascribed the official policy of discouraging the making of ical diagnoses). And the delay between a soldier's harge from hospital in, say, Comilla and his return to forward unit was often measured in numbers of weeks. eral of which were commonly spent in a convalescent pot. Hence soldiers with the mildest attacks of œbiasis were often casualties for many months.

A full course of treatment with E.B.I. and chiniofon tention enemata, followed by diodoquin and one of e arsenicals, was also prescribed for soldiers who had symptoms of amœbiasis but were found to be passing ts.

In the treatment of amœbiasis it is widely believed at a variety of drugs are complementary, and this was e reason why, in the Burma theatre and India during e war, it was at first customary and later obligatory give at least three groups of drugs, provided they were all available (which was *often not* the case): first, emetine injections followed by E.B.I. by *mouth* ; *second*, chiniofon retention enemata, or alternatively *diodoquin* ; and third, certain arsenical drugs, such as *acetarsol*, carbasone, and amibiarson. In addition, sulphaguanidine or other sulphonamide was commonly given, and in severe and relapsing cases penicillin. In treating amœbiasis greater stress is put on *régime* and *dietary* measures than in treating most other diseases. *Rest* is deemed necessary not only as an aid to recovery *but also* to minimise the toxic effects of emetine on the heart, and in the Burma theatre it was usual to order soldiers to remain in bed for their whole emetine course and often for longer.

Now, the severity of an attack of amœbiasis varies *infinitely*, and the untreated natural course of the disease is of exacerbations and remissions, which can be of varying lengths. The difficulties of assessing the value of a remedy for such a disease are very considerable even when it is given alone, and when numerous remedies are given simultaneously are even greater. So far as I know, nobody has yet published the necessary large-scale controlled series in which alternate cases are given a standard combination of remedies and the others this combination plus the preparation to be tested. In the absence of such evidence, treatment is a matter of opinion, and I offer the following propositions :

1. The reasons for supposing that *rest* and *dietary measures* can influence the course of amœbiasis appear to be no stronger than the reasons in favour of these remedies in other circumstances. That if a man lies down all day his diseased colon will heal, but that if he walks about it will not heal is unlikely ; and it is hardly conceivable that finely divided cellulose in the colon can prevent its healing (the residue-free character of a diet being considered the most important quality). The advocacy of rest to minimise the toxic effects of emetine on the heart appears, *a priori*, equally *groundless*. *Probably*, therefore, the right policy is the general policy I have suggested elsewhere (Todd 1949)—namely, that the patient's symptoms should determine his activities and the nature of his food.
2. There is no apparent reason for supposing that the use of *purgatives* in amœbiasis is in any way beneficial, while it must aggravate the diarrhœa.
3. There seems to be no good reason to think that the *arsenic-containing drugs* improve the results of emetine and the oxyquinolines alone. However, provided their exhibition is not allowed to interfere with the patient's return to work or duty—a most important proviso—they can hardly do harm.
4. Since most attacks of amœbiasis clear up with emetine and the oxyquinoline compounds, *sulphonamides* and *penicillin* are best reserved for cases whose attacks do not take so favourable a course.
5. There is no convincing empirical evidence in favour of the use of E.B.I. by mouth rather than *emetine* by injection. The findings of Rail (1947), in one of the few papers in which any attempt is made to compare the effects of the two preparations on a series of otherwise similar cases, suggest that in fact E.B.I. is not superior, but is possibly inferior, to emetine.
6. If emetine injections do not relieve acute symptoms within a few days, they are unlikely to do so later ; so there is no point in continuing the drug. If emetine is successful, probably nothing will be gained by continuing to give it, or E.B.I., for longer than about 10 days.
7. Oxyquinoline compounds are commonly given by both rectal and oral routes ; it seems reasonable to suppose that the lesions near the anus are best dealt with by enemata, and lesions higher up by the substances coming down from above. Since these drugs rarely cause toxic effects, it is doubtless sound policy to continue them by mouth for some time after the symptoms have subsided ; but long-continued administration per rectum can be condemned because it is trying to the patient and almost demands hospitalisation.
8. In a community where some 15–20% of people are passing *amœbic cysts*, *there is little* point in treating

victim of this disease becomes more ill with each attack until finally he fails to respond at all to treatment as long as he remains in the tropics.

DIAGNOSIS

Though no regulation was issued by the Army authorities urging that anti-amœbic treatment should not be given until the organism was isolated, it was nevertheless said or implied in the Army publications that the diagnosis should not be made until the *Entamœba histolytica* was discovered. Thus, the *Memoranda on Medical Diseases in Tropical and Sub-tropical Areas* (1942) states that "the diagnosis depends on the detection of *E. histolytica* in the motions." The instructions issued by ALFSEA in 1944 said: "For successful diagnosis of amœbic dysentery a 'red hot' stool is necessary. . . . If medical officers and pathologists are both 'on their toes' early diagnosis is assured. In cases strongly suspect but with negative stools sigmoidoscopy or proctoscopy and microscopic examination of ulcer scrapings may provide the answer . . ." These statements strongly suggest that the microscope is the only proper means of diagnosing alimentary amœbiasis. A similar conclusion is reached in such standard works as Manson-Bahr's *Manson's Tropical Diseases* (1940). And in the many papers on amœbiasis which have appeared during and since the war, though the great difficulty of diagnosing the disease is stressed, it seems to be generally assumed *that the clinical evidence provides insufficient grounds* for starting treatment.

Yet it has long been agreed that *E. histolytica* can be very hard to find (cf. Hayward 1946). And it is also widely realised that many cases of amœbiasis—the very cases from which it is most difficult to isolate the organism—do not reveal the "classical" picture with marked symptoms and "anchovy sauce" stools, but merely mild intermittent diarrhœa (without blood), vague abdominal discomfort, anorexia, nausea, and perhaps loss of weight.

In Burma the emphasis on the microscopic, as opposed to the clinical, findings inevitably delayed the initiation of treatment. A soldier might report sick in the forward areas and be evacuated through many medical units until, after perhaps a lapse of weeks, some pathologist would succeed in isolating the entamœba or some clinician would finally decide that the clinical evidence was sufficient to warrant beginning the exhibition of the drugs. Alternatively he would improve sufficiently with the aid of a chalk mixture to be discharged after a week or two with some such diagnosis as "gastro-enteritis" or "dyspepsia," to be later readmitted with a relapse. Sometimes soldiers with persistent symptoms typical of low-grade amœbiasis would be enthusiastically investigated by barium meal and enema radiography, gastric analysis, sigmoidoscopy, and stool examination. All these *studies being negative*, the conclusion would be reached that, organic disease having been "excluded," they must be neurotic.

When stationed with an Indian general hospital at Agartala in Bengal during the summer of 1945, with the help of Captain M. S. Khera, I.A.M.C., I made a special study of twenty-four Indian soldiers admitted under my care during a period of about 10 days. In coming from the Burma Front they had all passed through several medical units before reaching us, the average time they had been casualties then being 38 days. In these units each had had on the average about four stool examinations. Vegetative *E. histolytica* were of course never found. The main treatment they had received had been the ordinary chalk or kaolin mixtures; none had been given anti-amœbic remedies. The reason for withholding these remedies was not that an amœbic infection had been unsuspected, for on many of the documents appeared the provisional diagnosis "? amœbiasis"*; and this commonly appeared on the front of the field medical card over the signature of the M.O.—a signature then about 38 days old.

Their *histories* were strikingly similar. All said been unwell for 2-5 months (though this figure taken as accurate). All complained of anorexia and a discomfort, pain, or distension, particularly after Ten (42%) stated that they had had much vomitin had had a certain amount of diarrhœa, often in spell *nating with constipation, though this was not th* complaint. Thirteen (54%) stated that they had so passed blood in the stools. All complained of weakn *some loss of weight. Thirteen (54%)* had soreness tongue.

On examination, none had severe abdominal ten Nine (38%) were moderately tender over the ascen descending colons or both. Two (8%) had palpable livers. Sigmoidoscopy was performed on twenty case mucous membranes of four (20%) appeared nor eleven (55%) congested in places, swollen and " and covered to various degrees with thin tenacious and of three (15%) merely flecked with a little mucus. only could an ulcer suggesting amœbiasis be seen.

Smears taken at sigmoidoscopy were examined scopically, but vegetative entamœbæ were never Each patient had one stool examined, also with n results, though the special techniques employed to i the chances of finding the organism were not used.

These men were immediately treated as if the amœbiasis. All were given *ten injections of* e gr. 1 on successive days, coincidentally with ten ch enemata, followed by 'Amibiarson' for 10 day addition, all were given vitamin concentrates, b many had symptoms suggesting vitamin-B, defici Twenty (82%) rapidly became free of abdominal toms; even when asked leading questions none admit that his relief from dyspepsia and diarrhœ anything but complete. Three (*13%*) *said they* l diarrhœa and their indigestion became much l though still troubling them slightly. The remaini still complained of a good deal of indigestion, bu he had improved.

From all this I conclude that *the diagnosis of amo should not wait upon the discovery of the organis* should be made on clinical grounds. Even if it wer that *E. histolytica* could always be isolated *from* with amœbiasis within a short time, the pract *refusing to diagnose* that disease on clinical gr could, during the Burma campaign, be condemne practical reasons.

It was agreed that for rapid microscopic diagnosis it be necessary to examine repeated fresh stools from patient after he had taken salts and to perform sigmoido and take swabs from the bowel. The entire pathologica of a forward medical unit might consist of one jema sergeant technician working in a small tent. When cas were pouring into the unit he could not *possibly* spare the from such other duties as studying innumerable blood t testing urines, and performing blood-counts to spend poring over vast numbers of fresh *stools*. The main why the cases just described had only had about four examined, though they had been in hospital over five was doubtless the pressure on the *pathological* services units through which they had passed.

The *only rational objection* to the practice of tre amœbiasis on clinical grounds—for the *objection* th do so is "unscientific" may be dismissed *out of* h as in the case of malaria—*was* that it would cause who were in fact free of amœbiasis to be *given* amœbic remedies. And the prescribed course of t ment and aftercare made it *inevitable* that soldiers amœbiasis should be *casualties* for at least *two mo* *But I hope to show* later that this long minimum p was unjustified. If soldiers with "*clinical* amœbia

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* It may possibly be objected here that the cases were examples of primary vitamin deficiency, cured not by the amœbic remedies but by the vitamins. But there seem doubt that the dyspeptic symptoms had long prece mouth symptoms, while at that time the rations of the fo troops were very *good*.

In England Now

unning Commentary by Peripatetic Correspondents

E chief magistrate was imposing a fine of £10 and
sing my licence for twelve months. "This was
ibtedly a serious case of careless and haphazard
ig," he said, "and in future . . ."

this point I realised that the Court had not appre-
l my defence. This was that at the time of the
ent I was contemplating and formulating a new
for psychological research which I was about to
up for THE LANCET. For many years I have been
ed, irritated, frustrated, angered, or annoyed at
tupidity of my patients' reactions to my simple
s during my examination of them. If told to take
p breath through the mouth, they will invariably
e mucously through their nose. A request to
ve all clothing is usually translated as only some.
der to "get up on the couch and lie on your back"
ces many responses. The obsessional will slowly
ve his clothes and lay them neatly on a vacant
. and then equally neatly will unfold himself on
couch, sometimes face upwards and sometimes
Either way he will say "You did say on my back?"
. without awaiting an answer, he will promptly
over and back again with the further observation.
my back, of course, how silly of me!" All this is
nplished with great difficulty as the couch is only
een inches wide and very slippery. The athletic
chondriacal type will throw off his clothes, expand
hest, and then jump violently on to the couch.
invariably leads to a catastrophe for the reasons
dy mentioned. The patients who live only in the
nt always fail in this test. They remove their
es and place them upon the couch, so that at the
minute all their plans must be altered in order that
themselves may get on the couch.

t the patient who annoys me most is the fully grown
who does not seem to know his right hand from his
One would have thought that the average person
capable of realising which hand he uses for writing,
a woman would know which is her wedding ring
and that a young lad who did not know his right
from his left on leaving school would surely have
told more than once during his Army service.
in fact if you ask your patient to roll up the left
e there is a six to one chance that he (or she) will
by rolling up the right.

. . . and in future, I would suggest to the accused,
he desires to turn to the left he should put out
ear-side indicator and not the off-side one. If only
le knew their left hand from their right there would
wer accidents on the road."

* * *

Yes, it *is* a nuisance having to have an operation,"
I airily to my commiserating friends, "but at least
give me a few days' rest." Never was I more mis-
n. Even before I went down to the theatre for my
iotomy a hefty physiotherapy wench put me through
thing exercises which she advised me to use when
s coming round to dispel the lingering cyclopropane
ollowed her advice, and it certainly helped). The
next morning she was exhorting me, in company
all the other bed-patients of the surgical ward, to
eath IN—and OUT" and to raise head, arms, and legs
arious combinations and permutations of effort.
n the fractured femur in the Pearson bed next to
e had to waggle his sound leg in the air. Rest, my
! On the sixth day I sat out of bed, albeit only
the chair-commode waggishly labelled "L," by the
th I was walking gingerly around the ward, and on
twelfth I left the hospital, taking home with me
eral books which I hadn't had time to read.

Even in illness, it seems, there is nowadays no escape
the world-weary. The peaceful quietus of broncho-
eumonia for the elderly has been abolished by peni-
lin. Even the schizophrenic, thinking himself safe in
private dream-world, is rudely hoicked out of it by
C.T. or leucotomy. Next time I want a restful day or
o in bed, I shall get me a nice cosy old-fashioned cold
the head, the only Nirvanah that modern therapeutics
p to the moment of going to press) has mercifully spared.

* * *

A piece of fresh normal aorta, still warm, is not easy to get from our pathologists, and surgeons are easily insulted. We must send one of our girls down to the slaughterhouse; for the students must have their 90 microgrammes ($1{\cdot}98\times10^{-7}$ pounds) of flesh. Our histology department is "out of aorta," but a sheep's will do.

Our messenger returns. "They say you have to write to Dr. X of the Ministry of Health. It requires a permit." I ring WHI. 4300, and arrive, via several female voices, at that of the arch-aortamonger himself (thought: if he specialises in the second portion of the aorta, he will be entitled to a second arch). I explain my predicament. Ominous apologies, including the words "red tape" follow. He ends at last by saying that unfortunately he is no longer dealing with these matters (I suppose these cabinet-type reshuffles must go on at all levels all the time, and that this is the result of a thoracic purge). He refers me to their Kensington branch where a Mr. Y (this lack of a medical qualification disturbed me) will fix me up. Again the series of female voices. "Mr. Y is not available, but Mr. Z knows all about that sort of thing—but, no, I can really tell you myself! You write to us, we authorise it, and the Ministry of Food will grant a permit. No, in a *straightforward* case like yours it shouldn't take more than a few days."

It will probably mean cutting the aorta ration to 45 microgrammes ($9{\cdot}9\times10^{-8}$ pounds), but all must make sacrifices these days. Ours will be a rabbit.

* * *

I really must give my hobby horse another gallop. When it last had an outing I suggested that Sir Ernest Gowers should try to persuade medical writers, as well as civil servants, to give up verbose jargon and to use Plain Words instead. But now that I have joined up as a G.P. I can see why his first attack was against civil-service English.

I learned that I had permission to practise in a remarkable letter which reads as follows:

> "Your application . . . has been considered by the Committee and they have decided to grant the application, subject to the exclusion of the provision of general medical services by you, in those parts of the Executive Council's area where the Committee declared the number of doctors to be adequate, published in the *Lancet* of 30th July 1949, and *British Medical Journal* of the 6th August 1949, and any subsequent amendments published prior to the date of this letter. Such restriction is subject to the right of appeal against the decision of the Committee to the Minister. . . ."

The essential phrase here is, I think, "decided to grant the application," which evidently means that I may practise.

I soon received a bundle of forms and documents. To my delight I found one headed STATUTORY INSTRUMENTS, which contains the original of a now famous sentence: "Every woman by whom or on whose behalf a claim for maternity benefit is made shall furnish evidence that she has been, or that it is to be expected that she will be, confined by means of a certificate given in accordance with the rules for certification . . . or by means of such other certificate as the determining authority may accept. . . ." Such is the art of obstetrics in the Welfare State.

* * *

A simple case of hiccup (or hiccough) was shown at the physicians' meeting—a refreshing change from the rare and bizarre cases usually appearing at these learned gatherings. However, it was soon clear that this problem was frightfully complicated, for the hiccup may persist after the crushing of both phrenics, and in their enthusiasm to explain the movement some of the physicians began to imitate hiccup, with emphasis on the hic rather than the cup. At one point one wondered whether the whole audience might become afflicted, as in the medieval orgies when communities would succumb to some hysterical outburst (see Dancing Mania). Fortunately, the tone of the meeting was restored by the pronouncement of the neurologist, that we were dealing with a typical example of Focal Epilepsy of the Hind Brain.

ascertained cyst-carriers—unless perhaps they are engaged in preparing food. Patients with the symptoms of amœbiasis should be treated, even if the organism is not found. Those with the organism but not the symptoms should not be treated.

If these propositions are accepted, the ordinary attack of amœbiasis should be treated along the following lines. Injections of emetine gr. 1 are given daily for, say, 10 days, simultaneously with diodoquin by mouth, and perhaps with chiniofon enemata. During this period the patient, unless he is very ill, is encouraged to be up and about, except for several hours after the enemata (which, if given in the evenings, should not interfere with his activities). He has a full diet, so far as practicable to suit his tastes, and no purgatives or other ancillary drugs. For a further period afterwards he possibly has more diodoquin. Patients who are not completely symptom-free after this course, or who quickly relapse, should, after an interval, be given a further course of the same drugs accompanied or preceded by sulphonamides and penicillin and perhaps followed by other remedies.

While the problem of the treatment of amœbiasis remains obscure, it seems to me reasonable to adopt this scheme rather than others more complicated. The onus of proof should rest on those who state that long spells in bed, fluid or residue-free diets, regular purgative drugs, and a long course of E.B.I. are valuable.

If these conclusions are sound, the minimum period for being a casualty from amœbiasis should have been measured in small numbers of weeks (as it was measured by those who treated cases in forward medical units and ignored the regulations). The combined emetine, chiniofon, and diodoquin course could have been started in a casualty-clearing station or other equivalent forward unit immediately after admission. After some 10 days the patients who were still unwell, and those whose attack was a recent relapse, should have been evacuated to base hospitals for further treatment and, if necessary, invaliding. The remainder—as a rule the great majority—could then have been given an intensive toughening course (if coming from front-line units) and after a few days could have been discharged to duty, possibly with a supply of diodoquin or arsenic compound to take for a few weeks. Admittedly, until fairly late in the campaign, diodoquin was unavailable, and for the first year or so chiniofon was scarce; but in so far as there was a shortage of these compounds, the forward units could have been given priority.

It may be objected that a proportion of soldiers treated in this way would relapse shortly after returning to their units and become casualties again. But it would have been far better that a few men should become casualties twice than that a large number should be hors-de-combat for many months at a time. Those who had two attacks within a short period should have been sent to the base areas, to prevent their becoming casualties a third time.

DISCUSSION

My conclusions about amœbiasis thus resemble my conclusions about malaria. For the official policy towards the diagnosis and treatment of the two diseases was wrong for similar reasons: in diagnosis the microscopic aspects were given far too great an emphasis by comparison with the clinical, and in treatment soldiers were caused to remain hors-de-combat far longer than was necessary. In the case of malaria this policy was responsible for soldiers remaining undiagnosed for days and being casualties for weeks; in the case of amœbiasis it meant that soldiers often remain undiagnosed for weeks and became casualties for many months.

During three years in the tropics I discussed these problems with numerous clinicians, and many admitted that they too believed that amœbiasis should oft diagnosed on clinical grounds. Pathologists, on the hand, tended to have the opposite opinion, which is altogether surprising. Some of the advocates of clinical approach nevertheless seemed a little f they would *give* the anti-amœbic remedies without covering the *E. histolytica*, but they hardly liked t publish the fact openly, doubtless having a fear of bei dubbed "unscientific" by some scorning patholog With rare exceptions those who committed themsel to print seemed to take for granted the diagnost superiority of the microscope.

No European civilian in the tropics would stay i hospital for two months with a mild attack of amœbia And the difference between the lives of civilians and soldiers can no more excuse this prolonged hospitalisati for all soldiers with amœbiasis than it can excuse t practice of keeping every soldier with malaria in hospit for two weeks. The arguments against a minimu period of hospitalisation for malaria apply equally amœbiasis. For any attempt to make fixed regulati for a disease so variable, affecting soldiers wh conditions of life differ so widely, is surely unjustified

(To be continued)

Special Articles

THE CANADIAN ROYAL COLLEGE

FROM A CANADIAN CORRESPONDENT

THE annual meeting and convocation of the Roy College of Physicians and Surgeons of Canada was he in Toronto on Nov. 25 and 26. This is the first ti that the college has been convened outside of Ottaw Parliament was in session and the halls of the Châte Laurier Hotel were not available.

The first day was devoted to scientific papers. T of these were given by the first winners of the med offered by the college for essays on original work b young investigators. The contest is open to the professi throughout Canada, provided that the essayist be n more than forty years of age. Dr. Euchariste Samso of Quebec, won the medal in the division of surger with his paper entitled Traitement Radical du Canc de la Tête du Pancreas; and Dr. W. Stanley Hartrof of Toronto, was awarded the medal in the division of Toronto, was awarded the medal in the division medicine with a study entitled Aspects of Experiment Choline Deficiency.

At the convocation the address in medicine wa delivered by Prof. C. E. van Rooyen (Toronto), wh spoke on Current Problems in the Diagnosis and Treatmen of Virus Diseases. The address in surgery was given b Dr. Frank Lamont Meleney, associate professor surgery, Columbia University, New York, who discu the Clinical Application of the Present Knowledge Antibiotic Therapy to Surgical Infections.

Fellowships were awarded by the president, Dr. W. Gillespie, professor of surgery in the University Alberta, to Prof. William Boyd and Prof. W. W. Barr clough (Toronto), Professor van Rooyen, and Profess Meleney, among others. Honorary fellowship wa bestowed upon Lord Webb-Johnson, immediate pa president of the Royal College of Surgeons of Englan who addressed convocation. In his citation Prof. W. E Gallie (Toronto) said:

> "During the eight years that he was president he brough about a change in the college that the previous hundre years had failed to do. When he took office it wa primarily an examining board, dignified, aloof, cold. No it has become the very centre of postgraduate educatio friendly, stimulating, warm-hearted. He has changed i from a museum to a laboratory, from an examination ha to a postgraduate school, from a place of many unhapp recollections to a place where happiness abounds. Al students of our art are welcome there and those from overseas will find in it not only a spiritual but also literal home."

stigation of the second question has proved that the dentist nor his personnel are exposed to any isk of mercurialism, provided that they handle y with the necessary precautions—wearing rubber talls while mixing it, and squeezing out the ous mercury with the aid of chamois leather. ger[4] found that in dental surgeries the content of y vapour was 0·0277–0·948 mg. per c.m. air, while urine of two people who handled the amalgam he mercury content was 0·023–0·078 mg. and 240 mg. per 4 litres: in other cases no mercury und. On the other hand, Parfitt and Herbert[2] eports on the Berlin school dental service where kers were found to be excreting mercury. Lately, an and Dannenberg[5] have concluded that "the t of mercury vapor with which the average dentist nto contact in his office or laboratory is not toxic. trations of the vapor were so uniformly low e study was terminated after fifty dental offices xamined instead of the one hundred originally l." The authors state that toxicity will result if y vapour exceeds 0·1 mg. per c.m. of air.

n, W.1. H. J. TURKHEIM.

REATMENT OF PERNICIOUS ANÆMIA

–In your leading article of Dec. 3 you rightly ut the difficulty confronting the practitioner in ection of a preparation for the treatment of ous anæmia. However, one important point tted—namely, that of late years it has been ngly difficult to find, amongst all the parenteral tracts on the market, one that is really reliable. omitted this important point you sum up by that "the treatment of pernicious anæmia, still rests on the proper use of liver and desiccated- h preparations."

is hospital, during the past twenty years, patients g from pernicious anæmia have been treated in al clinic. We have therefore had an opportunity rving the same patients over many years and of the maintenance value of many extracts. From perience two important points emerge: (1) treat- must be controlled by periodic blood-counts, r reliable the liver extract used may have proved past: and (2) of recent years there has been a decline in the potency of liver extracts. There le evidence that other workers have had similar nce: and in the Oliver-Sharpey lectures, to you refer, Wilkinson[6] confirms the latter point ggests that the explanation lies in the use of so- "pharmaceutical" livers by the manufacturers.

arked has been this decline in potency of liver s in recent years that we welcomed the opportunity o us by Messrs. Glaxo Laboratories Ltd. to test s of vitamin B_{12} derived from botanical sources. the past six months we have treated with this ation fourteen patients who were suffering from rst attack of anæmia. All of them have given ous reticulocyte response followed by a rapid of hæmoglobin and red cells to normal levels. ition to these fourteen patients, we have success- reated relapses in eighteen patients who were ng for maintenance treatment by liver extract, ho had relapsed in spite of such treatment. Finally patients under liver maintenance treatment but relapse, who have been changed to treatment amin B_{12}, have volunteered that they felt better; such patients the red-cell levels have generally from 4·0–4·5 million per c.mm. to 5·0 million mm.

Whatever else may emerge from our experience, if the treatment of pernicious anæmia is to rest on the proper use of liver extracts as at present available, such treatment will be unsatisfactory. In our limited experience with vitamin B_{12}, we have yet to meet the patient that is not better for the change from liver extract to this preparation. We have little or no experience of the use of desiccated-stomach preparations and so cannot comment on this treatment.

Surely the position is that all pernicious-anæmia patients under treatment must receive adequate hæmatological control. If this condition is satisfied, then whatever treatment may be used it can be modified if hæmoglobin and red-cell levels are not maintained.

J. MILLS

Reading. E. H. HEMSTED.

ANONYMITY IN BROADCASTING

SIR,—Your correspondence on anonymity on the B.B.C. puzzles me. How can one be anonymous on a television programme, unless one wears a mask and disguises one's voice? Surely the situation is becoming ridiculous, because if in fact such measures are taken to their logical conclusion no doctor could ever appear on any public platform unless speaking from behind a screen and billed as an unknown doctor. The point about this question of advertising is whether these public appearances are for the purpose of gaining patients; and I cannot see that any harm is done by doctors broadcasting by sound or television, or by their public appearance, so long as it is obviously not for the purpose of advertising themselves.

I feel that the entirely negative attitude of the General Medical Council is to be deplored, and that they should formulate rules for guidance on this important matter.

Urmston, Lancs. BERNARD SANDLER.

OPERATIONS FOR MITRAL STENOSIS

SIR,—It might perhaps have been desirable to mention, in your leading article of Oct. 29, the influence of pathological changes in the intrapulmonary arteries and arterioles upon the outcome of operations for mitral stenosis. An investigation by Larrabee et al.[1] emphasises the importance of this aspect.

They have studied post mortem 20 cases of well-established mitral stenosis, the patients having mostly died as a direct result of the mitral lesion. The lesions found in the intrapulmonary arteries and arterioles were medial hypertrophy, intimal fibrosis, and medial scarring; in 6 there was medial hypertrophy only. Owing to these lesions, the calibre of affected vessels was reduced, with consequent increased resistance to blood-flow at this level.

The question naturally arises whether direct relief of the mitral stenotic lesion by operation on the valve itself might fail to produce the desired effect in the presence of widespread intrapulmonary arterial resistance. Right-heart failure might still ensue under such circumstances even though the mitral obstruction had been relieved. Larrabee and his co-workers suggest that in mitral stenosis medial hypertrophy probably represents the earliest organic change in these vessels; that a vessel so affected remains flexible and capable of dilatation after alleviation of the mitral obstructive lesion; and that no relief of the intrapulmonary resistance may be expected in the presence of intimal fibrosis and medial scarring. A similar line of reasoning is applicable to the operation of Bland and Sweet,[2] in which a venous shunt is established between the dorsal-segment branch of the right inferior pulmonary vein and the azygos vein. It is natural to assume that optimal benefit would be expected

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ger, W. *Schweiz. Mschr. Zahnheilk.* 1928, 38, 450.
man, L. I., Dannenberg, J. R. *J. dent. Res.* 1949, 28, 435.
inson, J. F. *Lancet*, 1949, i, 291, 336.

[1] Larrabee, W. F., Parker, R. L., Edwards, J. E. *Proc. Mayo Clin.* 1949, 24, 316.
[2] Bland, E. F., Sweet, R. H. *J. Amer. med. Ass.* 1949, 140, 1259.

Letters to the Editor

ACADEMIC SALARIES AT CAMBRIDGE

SIR,—We ask you to publish the following facts relating to scales of stipends at Cambridge[1]:

	Non-medical	*Preclinical*	*Clinical*
Professor ..	£1950*	£2050†	£2500
Readers ..	£1800 and £1600	£1800 and £1600	£2000 and £1800
Lecturer ..	£750–£50–£1250	£750–£50–£1250	£850–£100–£1450
Demonstrator or assistant lecturer	£600–£25–£700	£600–£25–£700	£700–£25–£800
Departmental demonstrator		£350 (no superannuation)	

* Plus administrative payments up to £400.
† Plus administrative payments up to £300.

In certain cases (both medical and non-medical) there are additional pensionable payments up to £120. The scale for teaching officers ordinarily resident in college is £100 less than that shown.

For the medically qualified man these scales mean that if he teaches at Cambridge rather than in other medical schools, he may be at a financial disadvantage amounting to some £6000 of pensionable stipend during his first ten years of appointment (due to the low annual increments), and at a final disadvantage of over £400 of annual pensionable stipend. These considerations may weigh heavily with the man who lacks private means but has a growing family, for which the "amenities of Cambridge" ought not to be measured thus.

These scales were approved by the university on Saturday Dec. 3. Many eminent men, both medical and non-medical, opposed this approval, which in their opinion would create a grave risk to the future of medical teaching in Cambridge—a risk which was avoidable and which therefore should not be incurred. They pointed out that in a comparable university different decisions had clearly been made in the national interest, with a proper appreciation of the problems arising from the nationalisation of medicine and the Spens report. They were refused permission to disapprove only of those stipends with which they were obviously concerned, and were heavily defeated by a large non-medical vote.

G. W. HARRIS
Cambridge. M. M. BULL.

*** On Nov. 19 (p. 970) we briefly summarised the arguments advanced in the senate on Nov. 1.—ED.L.

THE ANTERIOR TIBIAL SYNDROME

SIR,—In their excellent article of Nov. 19, Dr. Barham Carter and his colleagues put forward the hypothesis that a rise in tension is the essential feature in producing the ischæmia of this syndrome. Two findings are emphasised as significant evidence in support of this view:

1. The presence of old and recent hæmorrhages in 3 out of 9 cases. Since the biopsies were performed at three, four, and six months after onset, recent hæmorrhages are likely to be of little ætiological significance and old ones perhaps difficult to assess.

2. The associated lesion of the anterior tibial nerve, which was noticed in all their cases and which cleared up completely in 3. The authors suggest that this indicates a compression neuropathy, but is not this rather begging the question? While rightly giving prominence to this associated nerve involvement, the authors themselves suggest that "in those cases in which the nerve lesion recovered, the lesion may have been a mild and reversible type of nerve ischæmia."

In their extensive investigation, the electromyographic findings are particularly interesting. Of the 3 cases in which the extensor digitorum longus was examined, the response was normal in 2 and silent in the 3rd, whilst the corresponding tibialis anterior extensor hallucis longus were silent in all 3 cases. peculiar differential involvement of muscles is a experience of other observers, and cannot be disregarded in any hypothesis. That the tibialis an is subjected to greater strain than the toe ext fails to explain the differential involvement of th extensors themselves. Furthermore, tension wit single closed compartment must obey the la dynamics and tend to be distributed uniformly that space. The fact that arteriography showed n abnormal in all 4 cases where it was carried out significant addition to our knowledge, and vir excludes any permanent organic occlusion of the anterior tibial artery; while the negative oscillo findings some months after onset are perhap helpful.

It seems that this intriguing syndrome still with many of its secrets.

Liverpool. J. ROWLAND HUGH

MERCURY AS AN OCCUPATIONAL HAZAR

SIR,—In your issue of Sept. 10, I read the inter article by Dr. Agate and Miss Buckell on mercury p ing from fingerprint photography. The authors m the dangers of mercurialism amongst refiners, m makers, hatters, manufacturers of thermometers others. As a dental surgeon, may I make a few addi remarks regarding the hazard in my profession?

Our main filling material is amalgam—a silve mercury alloy—which is triturated in a mortar u sort of soft plastic dough is formed and is then fu triturated or "mixed" in the palm of the han either the dentist or his assistant. Excessive merc squeezed out until the material is plastic enough inserted into the cavity. This excessive mercury s be caught and kept under water with the rest o "waste" amalgam, but occasionally minute me balls escape and roll on to the floor.

From this procedure two problems emerge: (1 the patient be affected by the mercury alloy i mouth; and (2) are the dentist and/or his assi exposed to the risk of mercurialism?

The first question has been dealt with by St who suggested that quite a number of nervous di ances in modern man are due to chronic mercuria resulting from dental-amalgam fillings; accordin Stock these are worn away and dissolve very slow the saliva. On the whole, his findings were not acce by the profession.[2] There is, however, one form amalgam filling—the copper amalgam—which cont free mercury and is softer than silver amalgam. F recognised as a potential source of danger, it is less. Under the National Health Service regulat copper amalgams "are not to be regarded as perma filling materials, though they may be used . . . for conservation of deciduous teeth."

From time to time there are reports of idiosyncr to amalgam fillings, or rather to the mercury containe them. Bass[3] described such a case in a 15-year-old who had previously shown allergic symptoms to cury. After having a tooth filled with amalgam developed œdema of the lips and erythematous erupt on lip and cheeks. Similar eruptions occurred in ano child, aged 4 years, after taking calomel; when child was 7 years old, she developed œdema of the after the application of yellow oxide of mercury to eyelids. At 12 and 13 years of age the same reac took place after she had several teeth filled with a gam; on removal of the fillings the symptoms ce at once.

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[1] *Cambridge Univ. Rep.* Oct. 13, 1949, p. 200.

1. Stock, A. *Z. angew. Chem.* 1926, no. 15.
2. Parfitt, J. B., Herbert, W. E. Operative Dental Surgery. Lo 1944.
3. Bass, M. H. *J. Pediat.* 1943, 23, 215.

THE GUILLAIN-BARRÉ SYNDROME

—I have read Dr. Petch's article of Sept. 3 with nterest. During the war I observed cases of and polyneuritis following typhoid and para- inoculation. Of 10 such cases, 3 had severe culoneuritis with a protein content in the cerebro- luid (C.S.F.) of up to 500 mg. per 100 ml. This to study the problem very carefully, and to from a fresh viewpoint the pathogenesis of ritis associated with the "dissociation albumino- ique" of the C.S.F. Essentially my conclusions[1]

e Guillain-Barré syndrome is a non-specific neuro- gical syndrome that has no single cause.

nically cases may be divided into four groups: (a) those ed with chronic focal infection (in my series mostly pyogenic infections of bones, joints, or soft parts from war wounds); (b) those arising after infectious such as chronic sepsis, dysentery, typhoid, and ria; (c) those associated with inflammatory disorders astro-intestinal tract and liver; and (d) those arising ction of foreign protein (vaccine or serum).

ar as these four groups are concerned, it was d that the disorder arises from an unorganised on-specific allergic (parallergic) process, which ts itself as allergic-hyperergic (serous) inflam- in the peripheral nervous system and is usually ly severe in the spinal roots; it is thus funda- ly a pathergic reaction in the sense used by The "dissociation albumino-cytologique" bears marks of an exudate, rich in protein and poor , diluted by the C.S.F., and leaking into the hnoid space from the inflamed spinal roots and anes.

may explain the pathogenesis, but it does not on the ætiology. It is still uncertain whether believe is very probable—there is a further group s which owe their origin to virus infection. These have been the subject of lively discussion by n workers and especially Pette.[2]

A. BANNWARTH.

—I have read with interest the article on the n-Barré syndrome or acute infective polyneuritis Petch rightly emphasises the identity of the two ons.

rding therapy. I should like to call attention to ective character of the illness. This necessitates ministration of hexamine intravenously, of vitamins plex and C), and in serious cases blood-transfusion. seen several cases where the condition was greatly d by blood-transfusion. This has proved useful cases where recovery is delayed: 2–5 transfusions, 150 ml. of blood, have caused rapid improvement.

pest. T. DE LEHOCZKY.

—Dr. Petch has oversimplified the description of rome that is still the subject of controversy.[3,4] "syndrome" may be a generalised disease-entity ribed by Dr. Petch, and should be distinguished h and labelled "Guillain-Barré disease." As tch observes, this condition so closely resembles infective polyneuritis that the two names should arded as synonyms. This terminology has been d by Russell Brain in the latest edition of his logy.

consideration must be given to the Guillain-Barré ome, or infectious neuronitis, as many American ogists prefer to call the condition. This syndrome neurological manifestation of various toxic and infective conditions in which diagnosis may be difficult; this is particularly so with some of the neurological manifestations of infective mononucleosis.[4] The syndrome has been observed after the administration of sulphanilamides and pyrotherapy.[5] It has also been seen after exposure to mustard gas[6] and various infectious diseases—infective mononucleosis, diphtheria, infective hepatitis,[7] Malta fever, enteric fever,[8] and mumps.[9] I now exclude all these conditions and anterior poliomyelitis before accepting a diagnosis of "Guillain-Barré disease" or acute infective polyneuritis.

My experience of this disease in Iraq is not in keeping with Dr. Petch's statement that "complete recovery is the rule, but rarely the patient may die." All our physicians have come to regard the disease as serious; of 15 cases admitted to various hospitals in Bagdad, 8 are known to have died from respiratory symptoms. Dr. Petch's statement holds good, however, for our interpretation of the "syndrome"; in this group we have not yet come across a fatality.

Royal Hospital, Bagdad, Iraq. J. A. SHABY.

TORSION OF THE APPENDICES EPIPLOICÆ

SIR,—In connexion with the article of Oct. 1 by Sir Cecil Wakeley and Mr. Childs, the following case may be of interest.

On the evening of Oct. 21, 1949, a married woman, aged 30, was admitted to this hospital with a history that on the morning of Oct. 19 she had started to have generalised colicky pain across the abdomen. Twenty-four hours later pain began also in the right iliac fossa, at first only on movement but soon constantly. Nausea was present, but she had not vomited. When the pain first began the patient had diarrhœa, but since then had passed a normal motion. There had also been slight dysuria, and the patient stated that she was subject to occasional nocturnal frequency. Parturition had occurred eleven weeks previously, and the menstrual periods had not yet restarted; she had had two children.

The patient's temperature was 98·2°F, pulse-rate 80 per min., respirations 20 per min.; blood-pressure 130/90 mm. Hg. The tongue was very slightly furred and moist. On abdominal examination there was slight guarding of the upper part of the right rectus abdominis and well-marked tenderness in the right iliac fossa: a soft mass, thought to be omentum and distended cæcum, was palpable. On rectal examination no abnormality was detected. Acute appendicitis was diagnosed.

At operation a McBurney's incision was made. A little free fluid was evident in the peritoneal cavity. On exploration with the finger an indurated, mobile piece of tissue was felt and delivered in the belief that it was the tip of the vermiform appendix. However, it was immediately evident that the cæcum was clothed with very numerous appendices epiploicæ, and the hard object—a black, triangular gangrenous mass—was an appendix epiploicus which had become twisted. In fact its attachment to the bowel was by then so precarious that if left alone it would soon have been loose in the peritoneal cavity. On removal of it ligation of its narrow pedicle was found to be unnecessary. The normal vermiform appendix was also removed. The peritoneum, muscle, and external oblique fascia were closed with catgut. The skin was closed with 'Nylon' and clips. The abdomen was not drained. The patient made an uninterrupted recovery.

The usual explanation of torsion of an appendix epiploica—which tends to occur in obese arteriosclerotic subjects—is that as the appendix enlarges by the deposition of fat the elastic vein is forced to twist around the more rigid artery. This leads to venous congestion at the neck of the appendix and a continuation of the "hæmodynamic torsion" described by Payr. In this case, however, the patient was a young adult, who certainly was neither arteriosclerotic nor obese. One is

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rth, A. *Arch. Psychiat.* 1941, 113, 284; *Ibid*, 1943, 366; *Ibid*, 1948, 180, 531; *Ärztl. Wschr.* 1948, nos. 37–40.
, H. Die akut entzündlichen Erkrankungen des Nerven- ems. Leipzig, 1942.
n, J. R., Baker, A. B. *Amer. J. Med.* 1947, 2, 45.
, C. H., Weiderman, A., Blumberg, A., Ricker, W. A. h. intern. *Med.* 1947, 80, 366.
5. Garvey, P. H., Jones, N., Warren, S. L. *J. Amer. med. Ass.* 1940, 115, 1955.
6. Chusid, J., Marguardt, G. H. *Arch. Neurol. Psychiat.* 1946, 55, 57.
7. Zimmerman, H. J., Lowry, C. F. *Ann. intern. Med.* 1947, 26, 934.
8. Shaby, J. A. (to be published).
9. Abboudi, J. S. *J. R. Fac. Med. Iraq*, 1948, 12, no. 4 and 5.

to follow only when the intrapulmonary vessels are still capable of dilatation. The patients upon whom Bland and Sweet operated were subject to attacks of acute pulmonary œdema, often accompanied by hæmoptysis. They were relatively well between such attacks and showed only slight cardiac enlargement.

Bland and Sweet suggest that the procedure should be reserved for such patients with a fairly normal cardiac output. The operation offers a safety-valve for preventing attacks of acute pulmonary congestion, and were it later extended to a wider field in the treatment of mitral stenosis, structural changes in the smaller pulmonary arteries and arterioles should be carefully considered in assessing the ultimate result.

A. L. McAdam
J. Shafar.

Blackburn.

PERAXILLARY APPROACH TO THE STELLATE AND UPPER THORACIC SYMPATHETIC GANGLIA

Sir,—When Prof. R. H. Goetz, of Cape Town, visited this country last summer he persuaded me to adopt the peraxillary approach to the stellate and upper thoracic sympathetic ganglia. For the last few months I have used this approach, and as I have had many requests for a description of the technique, I should be grateful if you would allow me to give a short account of this.

Without going into the details of the anatomy of the sympathetic system, the operation consists in the removal of the second and third thoracic ganglia with the intervening chain, or alternatively, if it is desired to be strictly preganglionic, section of the chain below the third ganglion and of the white rami to this ganglion and to the second.

The patient is placed in the lateral position and wedged suitably on the table. The uppermost arm is extended to about 130°, drawn forwards, and placed on an arm-rest. It is important not to hyperextend the arm too far over the head, because on one occasion I had a temporary brachial-plexus palsy, due to the fact, I think, that I probably leant on the hyperextended arm during the course of the operation.

An incision is then made transversely across the axilla at the level of what is judged to be the second intercostal space. The obliquity of this incision depends upon the obliquity of the ribs in the particular patient; this can be felt through the axilla. The incision stretches from the latissimus dorsi posteriorly to the pectoralis major anteriorly. Either of these muscles may be partially incised, but I have found this necessary on only one occasion when a few fibres of the posterior border of the pectoralis major were incised to give better exposure.

The incision is deepened through fat and glandular tissue down to the intercostal space, bearing in mind that in the posterior part of the wound there lies the long thoracic nerve—the only structure of importance to be avoided. I usually do not see this nerve, but I am careful not to extend my intercostal incision too far backwards for fear of cutting it.

The second intercostal space having been exposed and identified, an incision is made through the intercostal muscles—a process which, because of the obliquity of the fibres in this region, is often more of a scratching than a clean incision. The anæsthetist is warned, and the pleura is entered. A retractor is then placed between the second and third ribs, and the best instrument for this purpose is half of a Tudor Edwards spreader, with the crossbar removed. I have found that a Tuffier retractor is not strong enough. The intercostal space is forcibly enlarged to about $1^1/_2$–2 in. The lung is allowed to collapse, and a moist gauze roll, 3 in. wide, is inserted into the pleural cavity, which, with the tail of the roll outside the wound, helps to keep the lung out of the way. A spatular retractor is inserted, together with a malleable light. It is then usually possible to see satisfactorily the upper part of the thoracic sympathetic chain shining through the parietal pleura. The adjacent intercostal veins, which in other approaches may cause such trouble, can be readily identified and avoided. I find it best to identify the stellate ganglion and the second and third thoracic ganglia before the parietal pleura over them is tampered with; otherwise the slight oozing which occurs as soon as the pleura is incised tends to mask the anatomy of these parts. In order to effect identification, a pair of lobectomy scissors is inserted into the cavity,
and the neck of the highest rib is identified by pal
the scissors. The ganglion lying on this rib is t
ganglion, and it is the two ganglia below this whi
removed.

At this stage the pleura is incised with a sp
handled knife, fitted with a no. 12 Bard Parker bl
has rather a scythed or hooked shape. The sp
handle is that to which I was introduced by Mr. Bro
of Birmingham, and which I use in hypertension
The pleura is incised over the required distanc
sympathetic chain seized immediately below the
glion. By dissection with the no. 12 Bard Parker
long-handled lobectomy scissors, together with
gauze held on long artery-forceps, this chain i
up and the required length removed. The mall
retractor, and gauze roll having been removed,
Edwards spreader is released and withdrawn, an
expanded by the anæsthetist.

No closure is necessary other than suturing th
continuous 'Nylon.' The patient may get up o
day, and so far I have had no trouble with pleur
or other intrapleural complications. Penicillin is
operatively for three days, and postoperative p
trolled in the usual manner. This postoperative
I believe, inversely with the amount of care with
ribs are retracted. If this is done slowly and gen
considerable degree of spread can be attained w
slight amount of trauma.

This communication is in no sense an a
claim priority, or indeed any credit wha
describing an operation which has been devel
where and will, no doubt, be fully described an
by its originator. I can only add that I have
the operation eight times and I feel that it is an
which deserves serious consideration. It is far
matic and far more anatomically certain
posterior approach. It is no more traumatic
anterior approach, and is agai
and a simpler procedure when
chain below the third thoraci
know that the claim is made that this gangli
exposed through the anterior approach, but
cannot invariably be substantiated.

H. J. B. A
Director
Department of

Guy's Hospital,
London, S.E.1.

AN EPIDEMIC OF ACUTE NEPHRIT

Sir,—I read with great interest Dr. Razza
in your issue of Oct. 15.

I treated 10 cases of acute nephritis in a mo
epidemic form during Dr. Razzaz's experience
the Palestinian refugees at the Jordan Red
Polyclinic in Amman. My cases were among
to-do. Thus bad living conditions and undue
to cold and damp weather had not much to do
epidemic. Moreover most of my cases were i
and almost all were accompanied by respiratory i
(especially acute tonsillitis), or preceded by
infection within the previous three weeks.

Diagnosis was based on the presence of œdema
blood-pressure; and laboratory examination
revealed albumin with casts and red blood-cell
numbers. All cases were treated with intra
injections of penicillin in a single large dose, in
to ordinary dietetic and diuretic measures. My
doses of penicillin are as follows: (1) under 1 yea
100,000 units in 1 ml. of distilled water; aged 2-
200,000 units in 2 ml. of distilled water; older c
500,000 units in 5 ml.; and adults, 1,000,000
5–10 ml. All 10 patients recovered in 7–10 day

Thus I agree with Dr. Razzaz that the dose
Fleming[1] were too small, and that larger dose
have given better results.

Djamil Faik Tutu
Under-Secretary of State for

Amman The Jordan.

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[1] 1. Fleming, J. *Lancet*, 1949, i, 763.

the apices of the diamond were needle-sharp. ibly the foreign body had passed along the bowel long axis in the direction of the bowel but then o lie transversely, and peristaltic movements the points to perforate the bowel wall. The said that he had had beef for dinner the day is symptoms began.

m and Somerset Hospital,
Taunton.
L. WYNN HOUGHTON.

HYPERSPLENISM WITH ARTHRITIS

-Dr. Gauld commences his interesting article of 3 as follows: "Hypersplenism was first described seman and Doan (1939, 1942)." But the term splenism" was certainly in use by Naegeli, rhaps other hæmatologists on the Continent, 1929. Otherwise I could not have written the g in 1929[1]:

> n regard to the functional activity of the spleen it robably become more and more convenient to speak *persplenism* and *hyposplenism*—by analogy with the *hyperthyroidism* and *hypothyroidism*, *hyperpituitarism* *ypopituitarism*. It will probably also be found that are various forms of hypersplenism and hyposplenism sponding to involvement of the various functions e spleen (and reticulo-endothelial system), apart from ow well-recognised function of the spleen as a blood- roir (Barcroft, &c.)."

xplains the idea of there being various "selective plenisms"—a subject which has been so well out by Wiseman and Doan and other modern and supported by their clinical observations. observations are, as Dr. Gauld points out, still d to throw light on, and confirm, doubtful points.

n, W.1. F. PARKES WEBER.

THE FIRST MEDICAL EXAMINATION

—As chairman of the biology examiners for the B. examination of the University of London, I like to comment on the article by Dr. Johnson r issue of Sept. 17.

curious that Dr. Johnson should think that the e of the first M.B. examination is to select appro- students for a medical career. Surely mere selec- not the purpose of this or any other examination. amination is a test of a student's knowledge in a lar subject, and it is the examiners' sole duty to at the student has attained a sufficient standard. first M.B. examination, this standard is an adequate dge of chemistry, physics, and biology—the basic s on which his future medical studies depend. xamination gives the student the opportunity to is intelligence, but intelligence without knowledge t let a candidate through any examination; this applies equally to later examinations in a medical t's course. Therefore the selective action of an ation is only incidental.

s widely believed that the external first M.B. ation is competitive, but this belief is completely Theoretically it is possible for all candidates to for all to fail. Unfortunately too high a percentage reach the requisite standard. The fault for this many instances not in the intelligence of the ts but in the inadequacy of the training, especially ools. Dr. Johnson would have done well to note e figures of passes among internal students, who tudied at the various colleges and medical schools university. Here the usual pass percentage is in ghbourhood of 60% and is often higher, but these ts have had the benefit of pursuing a course of g under experienced teachers and in laboratories good facilities for practical work. In schools, on her hand, usually only one or two students are aiming at a medical career, and they have to be included in the same class with other students whose aims are different. The school teacher therefore has to devise a course which will more or less suit all his students, which is often unsatisfactory for all. Furthermore, the facilities for practical work are often inadequate and the time limited; for many school-children preparing for first M.B. (and Higher Certificate too) are not allowed to concentrate on the particular subjects for their examination, but also have to continue with other school subjects simultaneously.

It is not in the least surprising that selection by the University College board and "selection" by the first M.B. examination do not agree; the two tests have different objects and different standards, and apply different methods. One is intended to determine whether a student has reached a certain standard of knowledge in certain subjects; the other is an attempt to estimate, from a less definite basis and by more intangible standards, a student's intelligence and potentialities. It would be unexpected if there was agreement between the two results.

London, W.1. C. C. HENTSCHEL.

STATUS OF THE PSYCHIATRIC SOCIAL WORKER

SIR,—The libéral attitude which your journal has always maintained prompts me to write to you on this matter.

It is of considerable concern to many of us in the psychiatric service that the vacancies for psychiatric social workers are so many and the candidates so few. It is of even more concern that the salary-scales for these extremely arduous posts are quite inadequate. The Association of Psychiatric Social Workers has, to its great credit, refused to lower the standard demanded of all entrants, and to those of us who work with these valuable colleagues that is a matter for congratulation and due thankfulness. But, Sir, I submit that these officers are seriously underpaid; and that the periods of leave granted to them annually are inadequate for anyone who pursues such an arduous and exacting profession. I suspect that these matters have been the subject of inquiry, and it would be interesting to know the fate of the results of any such inquiry, and any recommendations made by the appropriate committee.

I feel sure, Sir, that any suggestion that the status of the psychiatric social worker shall be raised by increase in salary-scale would be supported by my fellow psychiatrists.

Taunton. R. SESSIONS HODGE.

TRANSIENT SPIROCHÆTÆMIA AND SPIRILLÆMIA AFTER DENTAL EXTRACTIONS

SIR,—In their very interesting article of Oct. 1, Dr. McEntegart and Dr. Porterfield contribute to the knowledge of transient invasion of the blood-stream by bacteria from the mouth as a result of dental extraction. Several workers have investigated the problem of bacteræmia following removal of teeth, but we have so far not been able to find any work on transient spirochætæmia, spirillæmia, or viræmia following such operations.

Clinical evidence speaks strongly in favour of such a possibility. We have observed several cases of acute spirochætal (non-syphilitic) or spirillar cystitis following the extraction of decayed or damaged teeth.[1] We have seen others where the bladder disease was found to be of this nature, dental foci were sought, and diseased teeth removed with precautions in order to search for spirochætes in the apical focus and around the roots;

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[1] *Brit. med. J.* 1929, i, 766.

[1] Coutts, W. E., Vargas-Zalazar, R. *Brit. med. J.* 1946, ii, 982. Coutts, W. E. *Rev. Soc. chile. Urol.* 1947, 10, 175. Coutts, W. E. *Brit. J. ven. Dis.* 1948, 24, 109.

tempted to wonder whether the recent parturition played any part in the ætiology.

I should like to thank Mr. A. F. Goode for his advice, and Mr. J. Rubin for permission to record this case.

Royal Hampshire County Hospital,
Winchester.
DEREK G. JENKINS.

NASOPHARYNGEAL FIBROMA

SIR,—The following case adds one more to the list of cases of this condition.

In April, 1946, I examined a boy, aged $14^{1}/_{2}$, with obstruction of the right nostril. A reddish-looking mass was observed, and biopsy showed it be a highly vascular fibroma. At fortnightly intervals for two years the tumour was injected with different sclerosing fluids—phenol 2%, lithium salicylate, 'Ethamolin,' snake-venom, and sodium morrhuate. The growth neither grew nor retrogressed.

In July, 1948, he complained of pain over the right antrum, which proved to be infected. In addition slight exophthalmos appeared on the right side. Removal of the growth was decided upon, and this was performed through a modified lateral nasal rhinotomy. A good view was obtained of the growth, which appeared about the size of a tangerine and was attached to the sphenoid body with prolongations into the ethmoidal labyrinth. Great force was necessary to detach the growth from its base and there was considerable hæmorrhage during the whole operation, but this subsided on removing the main piece of growth. A blood-transfusion was begun during the second half of the operation, and in a few days the patient had recovered.

Recent examination shows slight persisting exophthalmos. There is no evidence of growth, but the right nasal cavity is spacious and crusting.

Liverpool Eye, Ear, and
Throat Infirmary.
JOHN MCFARLAND.

JEJUNAL PERFORATION WITH RESPIRATORY SYMPTOMS

SIR,—Ginzburg and Beller[1] have pointed out the difficulties in diagnosing perforation of the intestine by a foreign body, due to lack of any leading history, failure to demonstrate this type of foreign body with X rays, and the wide variety of clinical manifestations. According to Carp,[2] the usual pathological changes are early localised peritonitis, indurated inflammatory mass or tumour, abscesses, general peritonitis, and hæmorrhage. The following case does not fall exactly into any of these groups.

A male shop assistant, aged 24, was admitted to this hospital, with a tentative diagnosis of perforated gastric ulcer, on April 24, 1949. He said that a sudden severe pain had started ten hours before admission. The pain was felt in the epigastrium and in the left hypochondrium, was accompanied by nausea and vomiting, and became progressively worse, being especially severe during movement and breathing. The patient's bowels had last moved shortly before the onset of pain. The patient had passed urine that day.

On examination he lay quietly in a semi-prone position. His respirations were short and shallow, with brief periods of respiratory inhibition. He was slightly cyanosed, and there were no visible abdominal movements. The temperature was 99°F, pulse-rate 120, respirations 48 per min., blood-pressure 130/70 mm. Hg, and heart normal. Examination of the lungs revealed impairment of respiratory movement, especially on the left side. On auscultation faint vesicular breathing was heard. The tongue was dry but clean. The abdomen was normal in contour except in the epigastric zone, where it bulged. There were tenderness and rigidity, which spread and increased downwards and towards the left hypochondrium. Board-like rigidity was found in a small area two finger-breadths to the left of the umbilicus. Light palpation in this area elicited an excruciating pain. The patient cried out in agony and disliked being moved.

Operation.—Under spinal analgesia the abdomen was opened through a midline incision. Partial torsion of the jejunum, a small amount of fluid in the peritoneal cavity, and lymphadenitis were found. The torsion was reduced, and further exploration revealed a long foreign body protr from the wall of the jejunum below where the torsion been and moving freely with respiration. The thick e the foreign body was still in the lumen of the bowel occluded the opening in the bowel wall. The sharp po portion was projecting into the peritoneal cavity and directed upwards and outwards against the parietal toneum. The perforation was closed after withdraw the foreign body through the wall of the bowel, and meser glands were removed for biopsy. The foreign body w fish-bone, curved and thickened at one end, meas nearly 5 cm. The patient could not remember ha swallowed a fish-bone. Biopsy of the mesenteric gl showed chronic inflammation. The patient made uneventful recovery.

This case presents points of unusual interest from clinical point of view and from the findings at operat The question arose whether the symptoms were a ciated with a supra- or infra-diaphragmatic lesion. E respiration was accompanied by severe pain. Du the short period of respiratory inhibition the patient free from pain. The slightly cyanotic condition the shallow respiration suggested a supradiaphragm lesion; but fullness of the epigastrium, rigidity, ten ness, and the negative result of the physical examina of the chest led to laparotomy being performed in sea of a perforation of the stomach. The findings at opera showed that the shallow breathing and the agoni pain during respiration were due to the irritation of parietal peritoneum by the sharp point of the fish-b impinging on it with each respiratory movement change of position. The partial torsion of the jejun was insufficient to explain the clinical sympto Probably the irritation caused by the fish-bone led excessive intestinal contraction, which produced tors of the jejunum proximal to the fish-bone, forcing through the wall of the bowel. Peritonitis follow penetration of the wall of the bowel was proba prevented by the thick end of the fish-bone acting a plug.

I wish to thank Mr. R. J. Rutherford for permission report this case.

Ashington General Hospital,
Northumberland.
ROMAN REJTHAR

FOREIGN BODIES IN THE ABDOMEN

SIR,—The following case, which was admitted to h pital under my care a week ago, is of interest in view the article of Sept. 10 by Mr. Travers and subseque correspondence.

The patient, a man, aged 49, gave a history of sudd onset of severe pain in the upper abdomen the previous aft noon. He had vomited several times during the night, wh the pain became less severe and shifted to the right of t umbilicus. On admission he did not appear to be very i and he had only slight pain. He complained of nausea b had not vomited for some hours. He had had an appendicectomy six years previously, and there was a scar of a rig paramedian incision, through which drainage had obvious been effected. He thought his appendix had perforat at the time of operation. There was some guarding of t right rectus muscle, and tenderness to the right of t umbilicus. A provisional diagnosis of subacute obstructi in the region of the terminal ileum was made.

On opening the abdomen, the intestines were cover by omentum, and when this was moved to one side son turbid fluid escaped. A hand was inserted into the abdomin cavity, and a loop of small intestine was grasped between th finger and thumb, when a sharp prick was felt in both fing and thumb. When drawn from the abdomen, the loop prove to be terminal ileum. Two small perforations, one on eac side of the bowel, were seen, and a foreign body could b palpated inside the bowel. A small incision was made and the foreign body withdrawn. The perforations wer oversewn and the abdomen closed without drainage. H convalescence has been uneventful.

The foreign body proved to be a diamond-shaped piec of beef-bone, $1^{1}/_{4}$ in. long and $^{1}/_{3}$ in. wide at its wides

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[1] Ginzburg, L., Beller, A. J. *Ann. Surg.* 1927, 86, 928.
[2] Carp, L. *Ibid*, 85, 575.

; the apices of the diamond were needle-sharp. bly the foreign body had passed along the bowel its long axis in the direction of the bowel but then to lie transversely, and peristaltic movements d the points to perforate the bowel wall. The tient said that he had had beef for dinner the day fore his symptoms began.

Taunton and Somerset Hospital,
Taunton.

L. WYNN HOUGHTON.

HYPERSPLENISM WITH ARTHRITIS

SIR,—Dr. Gauld commences his interesting article of ov. 26 as follows: "Hypersplenism was first described y Wiseman and Doan (1939, 1942)." But the term hypersplenism" was certainly in use by Naegeli, d perhaps other hæmatologists on the Continent, bout 1929. Otherwise I could not have written the llowing in 1929[1]:

> 'In regard to the functional activity of the spleen it will probably become more and more convenient to speak of *hypersplenism* and *hyposplenism*—by analogy with the terms *hyperthyroidism* and *hypothyroidism*, *hyperpituitarism* and *hypopituitarism*. It will probably also be found that there are various forms of hypersplenism and hyposplenism corresponding to involvement of the various functions of the spleen (and reticulo-endothelial system), apart from the now well-recognised function of the spleen as a blood-reservoir (Barcroft, &c.)."

his explains the idea of there being various "selective ypersplenisms"—a subject which has been so well orked out by Wiseman and Doan and other modern riters and supported by their clinical observations. any observations are, as Dr. Gauld points out, still quired to throw light on, and confirm, doubtful points.

London, W.1.

F. PARKES WEBER.

THE FIRST MEDICAL EXAMINATION

SIR,—As chairman of the biology examiners for the st M.B. examination of the University of London, I ould like to comment on the article by Dr. Johnson your issue of Sept. 17.

It is curious that Dr. Johnson should think that the rpose of the first M.B. examination is to select appropriate students for a medical career. Surely mere selec- on is not the purpose of this or any other examination. n examination is a test of a student's knowledge in a rticular subject, and it is the examiners' sole duty to e that the student has attained a sufficient standard. the first M.B. examination, this standard is an adequate owledge of chemistry, physics, and biology—the basic ences on which his future medical studies depend. he examination gives the student the opportunity to ow his intelligence, but intelligence without knowledge ill not let a candidate through any examination; this rely applies equally to later examinations in a medical dent's course. Therefore the selective action of an amination is only incidental.

It is widely believed that the external first M.B. amination is competitive, but this belief is completely lse. Theoretically it is possible for all candidates to ss or for all to fail. Unfortunately too high a percentage il to reach the requisite standard. The fault for this s in many instances not in the intelligence of the udents but in the inadequacy of the training. especially schools. Dr. Johnson would have done well to note o the figures of passes among *internal students*, who ave studied at the various colleges and medical schools f the university. Here the usual pass percentage is in he neighbourhood of 60% and is often higher. but these tudents have had the benefit of pursuing a course of raining under experienced teachers and in laboratories ith good facilities for practical work. In schools, on he other hand, usually only one or two students are aiming at a medical career, and they have to be included in the same class with other students whose aims are different. The school teacher therefore has to devise a course which will more or less suit all his students, which is often unsatisfactory for all. Furthermore, the facilities for practical work are often inadequate and the time limited; for many school-children preparing for first M.B. (and Higher Certificate too) are not allowed to concentrate on the particular subjects for their examination, but also have to continue with other school subjects simultaneously.

It is not in the least surprising that selection by the University College board and "selection" by the first M.B. examination do not agree; the two tests have different objects and different standards, and apply different methods. One is intended to determine whether a student has reached a certain standard of knowledge in certain subjects; the other is an attempt to estimate, from a less definite basis and by more intangible standards, a student's intelligence and potentialities. It would be unexpected if there was agreement between the two results.

London, W.1.

C. C. HENTSCHEL.

STATUS OF THE PSYCHIATRIC SOCIAL WORKER

SIR,—The liberal attitude which your journal has always maintained prompts me to write to you on this matter.

It is of considerable concern to many of us in the psychiatric service that the vacancies for psychiatric social workers are so many and the candidates so few. It is of even more concern that the salary-scales for these extremely arduous posts are quite inadequate. The Association of Psychiatric Social Workers has, to its great credit, refused to lower the standard demanded of all entrants, and to those of us who work with these valuable colleagues that is a matter for congratulation and due thankfulness. But, Sir, I submit that these officers are seriously underpaid; and that the periods of leave granted to them annually are inadequate for anyone who pursues such an arduous and exacting profession. I suspect that these matters have been the subject of inquiry, and it would be interesting to know the fate of the results of any such inquiry, and any recommendations made by the appropriate committee.

I feel sure, Sir, that any suggestion that the status of the psychiatric social worker shall be raised by increase in salary-scale would be supported by my fellow psychiatrists.

Taunton.

R. SESSIONS HODGE.

TRANSIENT SPIROCHÆTÆMIA AND SPIRILLÆMIA AFTER DENTAL EXTRACTIONS

SIR,—In their very interesting article of Oct. 1, Dr. McEntegart and Dr. Porterfield contribute to the knowledge of transient invasion of the blood-stream by bacteria from the mouth as a result of dental extraction. Several workers have investigated the problem of bacteræmia following removal of teeth, but we have so far not been able to find any work on transient spirochætæmia, spirillæmia, or viræmia following such operations.

Clinical evidence speaks strongly in favour of such a possibility. We have observed several cases of acute spirochætal (non-syphilitic) or spirillar cystitis following the extraction of decayed or damaged teeth.[1] We have seen others where the bladder disease was found to be of this nature, dental foci were sought, and diseased teeth removed with precautions in order to search for spirochætes in the apical focus and around the roots;

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[1] *Brit. med. J.* 1929, i, 766.

[1] Coutts, W. E., Vargas-Zalazar, R. *Brit. med. J.* 1946, ii, 982. Coutts, W. E. *Rev. Soc. chile. Urol.* 1947, 10, 175. Coutts, W. E. *Brit. J. ven. Dis.* 1948, 24, 109.

and in these cases we have invariably found, on dark-ground examination, that organisms resembling *Spirochæta dentium* were present—a finding noted in certain dental diseases by Cavalié and Mandoul,[2] Kritchewski and Séguin,[3] and Gins [4] among others. Probably many more cases escape diagnosis because we do not usually ask our patients if they have recently been having, or are having, dental treatment. In some instances we have discovered transient urinary excretion of spirochætes in catheter specimens from both bladder and ureter, in symptom-free patients after removal at one session of several diseased teeth.

All these facts can, in my opinion, only be attributed to transient spirochætæmia or spirillæmia. Who knows that further investigation might not help us to explain many of the symptoms attributed to focal infections of dental origin ?

Santiago, Chile. W. E. COUTTS.

DEOXYCORTONE ACETATE AND ASCORBIC ACID IN RHEUMATOID ARTHRITIS

SIR,—Since the preliminary report by Lewin and Wassén published on Nov. 26, I have treated 10 established cases of rheumatoid arthritis ; 6 have had two injections of deoxycortone acetate and ascorbic acid at weekly intervals, while the other 4 have had only one. Six further cases of rheumatic disease, not classified as rheumatoid arthritis, also received the same treatment.

At this stage I should not have felt justified in making a report, but my experience is so vastly different from that recorded by Dr. Kellgren last week that I feel impelled to communicate the results so that physicians interested in this form of therapy should not be too greatly discouraged by his report. In no single case of rheumatoid arthritis has there been no response whatever to the treatment ; and in some of the cases the response has been almost as startling as those noted in the reports on 'Cortisone' and adrenocorticotropic hormone. Patients who were able only to walk with crutches succeeded in walking unaided within a few minutes of the treatment. The degree and length of improvement varied in different patients. Most patients agree that the immediate improvement was not maintained at the same level after the first 24–48 hours, but all except one assert that they were much better for the rest of the week than they had been for considerable periods of time, ranging from three months to two years.

In those patients who received two injections, the immediate response to treatment with the second injection was just as remarkable as with the first, except for the one case mentioned above. The six non-rheumatoid-arthritis cases showed little or no improvement and two were worse.

It seems at first sight incredible that the same materials used on the same kind of disease in two places not more than two hundred miles apart should provide such contrasting results. Perhaps the answer may lie in the circumstances surrounding the patients undergoing treatment. Dr. Kellgren had his patients in hospital, where presumably they were rested and treated under optimal conditions and were, as he suggests, in a stable condition—i.e., one may assume that they had the minimum of pain with the maximum of movement that their condition allowed. In my cases the patients were ambulatory in varying degrees, with or without crutches, and unable to take proper rest, or indeed to have any form of treatment beyond that which I had been giving them up to the date of these new injections. Their improvement therefore might be interpreted as a physiological response to the hormone used, whereas the condition of Kellgren's cases had already reached this physiological stability and could not gain—and indeed be made worse—by the introduction 'c hormone.

The problem of rheumatic disease is far too co to discuss in a letter, but I think it is reasonably ol to physicians studying arthritis that the end element is only one factor in the problem. In rheum arthritis it is undoubtedly the dominant factor, bu improvement obtained with this form of trea must of necessity be limited in its degree. diligently studying the effects of treatment in cases, we must not lose sight of the fact that perm or complete cure cannot be expected by hormone ment alone ; and, if used injudiciously, it may aggr rather than cure the condition.

Might I suggest to Dr. Kellgren that he should his experiments on some of his outpatients living much less favourable conditions than the Manc Royal Infirmary offers, before finally deciding a the efficacy of this treatment ?

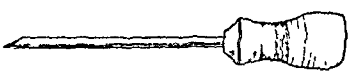
A further point which may be remarked upon is the remedy can hardly be classed as expensive, sinc retail price of one combined injection is rather less 7*s.* 6*d.* ; and no doubt this could be greatly red particularly where, as seems probable both from Lewin and Wassén report and my own very experience, smaller doses achieve the same result.

I should not like to close this letter without reco the great pleasure—albeit with some mental rese experienced by myself and some of my colleagues witnessed the astonishment and joy on the faces o patients who were able to perform acts of locom of which they were previously incapable.

London, W.1. WILLIAM W. F

INTRAVENOUS CANNULA

SIR,—The ingenious cannula-needle described Dr. Ellis (Oct. 15) invites comment. A very number of needles have been invented for intrave therapy and for each a number of advantages have enumerated.



The insertion of a needle into the vein is an opera of precision, and no invention has so far been to dispense with technician's skill facilitated one naturally adept. my opinion the best cannula is the simple nee no. 20 S.W.G., fitted to a standard mount, shown in accompanying figure.

But to obtain satisfactory results attention must directed to the finer details in technique :

1. *The recipient vein must not be button-holed.*—The cu veins are only used in exceptional circumstances ; the fore veins are nearly always accessible. Much greater contr possible with a syringe attached to the needle. Injury to vein by a sudden thrust is avoided by first inserting the ne along the side of the vein ; the needle is withdrawn parti and the point then "felt" through the vein wall.

2. *The needle must lie in the vein correctly.*—After its has entered the lumen of the vein, and whilst the veins kept distended with the manometer, the needle is advan gently and as far as possible.

3. *The needle must be fixed in position.*—Adhesive strapp in direct contact with the needle, without interposed ga fixes the needle so that no movement of its point within vein is possible. Added security may be obtained by usin splint. The operator himself must make himself respons for fixing the needle, since he alone knows the direction the vein and the position of the needle tip.

Such technique renders the Ellis cannula-needle a all other similar inventions unnecessary. The transfus can be set up in a few minutes, and as a rule will conti to run just so long as precautions are taken to ens that the drip is indeed continuous and not intermitt

E. S. R. HUGHES.

London, E.11.

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[2] Cavalié, M., Mandoul, G. *C.R. Soc. Biol., Paris*, 1921, 85, 1068.
[3] Kritchewski, B., Séguin, P. *Rev. Stomatol.* 1923, 25, 452.
[4] Gins, H. A. *Dtsch. Militärärztl. Z.* 1942, 7, 553.

CEREBRAL PALSY

ir,—I was very interested to read the article by Agassiz, Dr. O'Donnell, and Mrs. Collis in your e of Dec. 3. I do not feel, however, that the differentia- i of cerebral palsy from mental retardation can be le on several of the features which they suggest: et the differentiation can be one of extreme difficulty. mentally retarded infant is retarded in all fields development. It is therefore retarded in social aviour, and it is incorrect to say that a retarded at smiles early. He is retarded in all forms of motor elopment, and therefore shows many of the features ch the writers describe as characteristic, or at least gestive, of cerebral palsy. He is likely to be late in ag the reflexes and involuntary movements of early ncy—the reflex crawling, walking, and swimming ements, the Moro, tonic-neck, and grasp reflexes, the reciprocal kick. He is late in developing head trol, in straightening his back in the sitting position, learning to sit, stand, pull himself to the standing ition, roll, crawl, creep, and so on. He is late in nipulative behaviour and so in holding objects placed his hand, and later in going for objects and grasping m voluntarily, and later still in finer manipulation, h as finger-thumb apposition. Since he is late in owing with his eyes and turning his head to the rce of sound, he is commonly thought to be blind leaf. He is liable to have feeding difficulties, such as k of interest in food, or marked slowness in suckling. ther is dribbling a reliable guide. In the first place ormal infant slobbers until somewhere between a r and eighteen months. In the second place, a rded infant may be just as late as a case of cerebral y in the inhibition of dribbling. It is true that a y with cerebral palsy will be late in approximating lips tightly to his mother's or bottle's teat, so that k escapes during suckling, but so will the retarded l. None of those features, therefore, distinguish tarded child from the child with cerebral palsy.

n a minor degree of cerebral palsy, such as a mono- ia, as I think the writers imply, there may be none these features, the only abnormality noted being ness of one limb during dressing or bathing, or ormality of the pattern of movement in that limb n the child is kicking his legs and waving his arms nt in the wakeful state, or when he is going for an ct. In other cases, in which the spasticity affects ost solely the lower limbs, there is very little or no rdation in manipulative or social behaviour—immediately distinguishing the mentally retarded d who is late in all fields of behaviour.

is only in the severe case that the differentiation ally difficult, because, as the writers say, the child severe cerebral palsy is retarded in almost all s of development. It may still be possible, however, istinguish the two by the social responsiveness of the bral palsy (bearing in mind the mechanical difficulty smiling and vocalisation), the perseverance and centration on a task, such as picking an object up, eagerness and determination to reach it, and the ious satisfaction when it is placed in his hands. has to judge the child more by his intention than his achievement of the act. A normal child is able grasp an object a relatively short time (6–8 weeks) r he has first shown his desire to reach it (after he "grasped it with his eyes," as Gesell says). A arded child is late in showing interest in reaching objects, displays very little concentration and severance, and is late in achieving the act. A child h cerebral palsy may show interest early, but many ks may go by before he grasps an object. A careful erver can detect this intention and desire to grasp g before the child can achieve the act.

One important early sign of cerebral palsy is the intensity of the grasp seen in the flexion of hands and toes. The hand may be so tightly clenched that the finger-nails make the palm of the hand bleed. In a normal baby the hands lie open or only loosely closed by the age of 12 weeks: in a case of cerebral palsy affecting the hands they lie clenched long after that. Another and vitally important sign is the abnormal pattern of movement, not necessarily athetotic. This may be noticed when the child is kicking his legs and waving his arms, but it is much more likely to be noticed when the child is grasping an object: the slow opening of the hand, and the approach to the object with dorsiflexed wrist and extended fingers, is characteristic, and recognised early by one conversant with the normal. The retarded child does not show this abnormal pattern.

Other signs of cerebral palsy, such as adductor spasm in the thigh muscles, resistance in supination of forearms, and resistance to dorsiflexion of feet with extended knees, are naturally looked for.

I would like to add that by far the best articles which I know on the subject of the early diagnosis of both mental defect and cerebral palsy are in Gesell and Amatruda's *Developmental Diagnosis* (London, 1947).

Department of Child Health,
University of Sheffield.

R. S. Illingworth.

CURARE AND PRECIPITATE LABOUR

Sir,—With regard to Dr. Nosworthy's letter of Nov. 26, my clinical impression—confirmed by an obstetric colleague—is that the increase in the tone of the pregnant uterus is much greater when curare and cyclopropane are used together than when cyclopropane is used alone. In some cases of cæsarean section where curare has been used, the increase in uterine tone has been so marked as to cause temporary embarrassment to the surgeon, and in consequence some surgeons have abandoned the routine injection of 'Pituitrin' into the uterus in these cases. That cyclopropane alone can increase uterine tone there is little doubt, but it would appear that in this respect curare is the chief offender. In view, however, of Mr. Mills's contention (Dec. 10) that curare by itself does not produce strong contractions of the pregnant uterine muscle, it would be interesting to have the views of other anæsthetists and obstetricians.

Scunthorpe, Lincs.

W. N. Rollason.

B.C.G. VACCINATION

Sir,—It was with pleasure that I read the letter from Mr. Francis in your issue of Dec. 10 (p. 1105), for it seems that while we differ in what is relatively inessential we are wholly in agreement on the essential. He confirms my view that in the particular study of B.C.G. vaccination that I criticised there were, in fact, differences between the vaccinated and control groups. He believes that these differences are unimportant; I, naturally enough, need statistical evidence to satisfy me—a full statistical analysis is the essence of a satisfactory trial. But that difference of opinion over one item from the past is unimportant in comparison with the question of the future. Mr. Francis, after obviously wide reading and thought, has reached a conclusion with which I am wholly in agreement. I share his doubts whether "one is justified in carrying out a controlled trial on children or adolescents specially exposed to infection." I share his conviction that "an extensive controlled trial of B.C.G. should be carried out on a section of the general population—i.e., those persons not known to be exposed to special risk." I believe we have the necessary skill and experience to carry out such a trial in this country and I hope we may seize the opportunity before it is too late.

London School of Hygiene
and Tropical Medicine.

A. Bradford Hill.

Medicine and the Law

An Unusual Case of Shoplifting

ON Dec. 2, a 24-year-old woman, who admitted having stolen goods to the value of £4 15s. from three London stores, was fined £10 with 5 guineas costs at Great Marlborough Street police-court. On the day in question she had, according to her story, taken some 20–25 mg. of amphetamine sulphate, and a medical witness testified: "In my opinion, if this girl took the number of tablets she claims to have taken, they would induce hilarity and irresponsibility; and she certainly would not realise the effect of what she was doing." Imposing the fine, the magistrate observed: "I would not accept that from you or anybody else. I can see absolutely no connexion between the tablets and a girl going from store to store plundering shopkeepers."

The accused woman, who was reported to be of excellent character, had consulted her doctor on Nov. 21 because of varicose veins; and, since she was overweight, he prescribed 5 mg. amphetamine sulphate ('Benzedrine') three times daily with the object of reducing her appetite. On Nov. 22 and 23 she took the prescribed doses, and she was said to have behaved excitably and to have remarked that the medicine made her feel "very, very happy." On Nov. 24, she apparently took a 5 mg. tablet on rising, 2 further tablets at 10.30 A.M., and either 1 or 2 more (she could not remember which) at 12 NOON; for breakfast she had one slice of toast, and she ate no lunch. In the early afternoon she remarked that she felt as if she were "floating on air." At 4.45 P.M. she was arrested by a woman detective officer, who said that the woman behaved in a very extraordinary way which was compatible with her being under the influence of some drug. On being told that she would be arrested, she laughed heartily and remarked: "Yes, I took them; but it's all a game. It's such fun."

War-time tests of the analeptics, amphetamine[1] and methedrine,[2] showed that a dose of 15 mg. sometimes evokes irresponsible and irrational behaviour, with euphoria, confusion, and excitement. The reaction, which varies between one person and another and in the same person from one occasion to another, is unpredictable from the individual's normal personality.

Parliament

Charge for Prescriptions

WHEN the House of Commons on Dec. 9 accepted the Lords' amendments to the National Health Service (Amendment) Bill,[3] discussion centred on the new clause empowering regulations to be made for charging for pharmaceutical prescriptions. The clause, as Mr. ARTHUR BLENKINSOP, parliamentary secretary to the Ministry of Health, pointed out, is drafted widely because the exact nature of the arrangements have not yet been settled. Discussions are still proceeding, but Mr. Blenkinsop repeated the assurance that old-age pensioners and ex-Service war pensioners would be relieved of the charge.

Mr. WALTER ELLIOT said that the Opposition did not propose to divide against the amendment, but he asked some cogent questions: when would the regulations be laid before Parliament; would the charge be based on each prescription or on each prescription form; would a flat rate or a graded rate be charged?

Dr. SANTO JEGER feared that the charge would deter the wrong people from going to the doctor, but he added that he might not be so opposed to the step as a general principle if there were adequate exceptions. The Minister had lately spoken of "a cascade of medi being poured down people's throats." But medi were often given as a mental poultice, and one spee even though delivered with the eloquence of Mr. Bev would not alter the mental make-up of the world. Mr. I LINSTEAD, secretary of the Pharmaceutical Soc did not condemn a "pay as you use" proposal o hand, but he did not see why it should be restricted t pharmaceutical service. He contended that Parlia should not be asked to go too far in approving the sc until they knew the details. He also compl that the chemists had not yet been brought into discussions.

Mr. SOMERVILLE HASTINGS wanted to know whe the great Socialist principle of "each according t need" was to be replaced by "each according shilling." He doubted whether neurotic people go to the doctor more often than they need woul deterred by a shilling from the enjoyment of bad he which was perhaps the chief interest of their li It was more likely that the change would deter the mother with young children. Again, the doctor save the pocket of a poor patient, might order a mon supply of medicine instead of a fortnight's. Might this result in more medicine being ordered rather less?

Mr. ANEURIN BEVAN admitted that he did not know all the answers as to how he would use t new powers. Before a practical scheme was worked there would have to be discussions with chemists doctors. The charge itself created no administra difficulties, but the exemptions did. Economy, he tinued, was not achieved by transferring a charge f the State to the individual; a proper economy w more efficient way of giving service. This charge not proposed only in consequence of a demand economy; otherwise why should the charge be m in respect of the [illegible] alone? Exp ence had shown [illegible] of the serv in which the general practitioner was most invol that the greatest load had fallen. Abuse had arisen only on bottled medicine, but on aspirins and banda which the patient could often buy for less than a shil without making a second call on his doctor. T proposal would have met with far greater indigna if there had not been an awareness of abuses. He not suggest that this should be a permanent feat of the health service, and it was only put forward a temporary easement. The estimate of a saving £10 million was based on the assumption that there wo be no exemptions, and the saving would now be redu to the extent of the exemptions.

The regulations would require the negative-resolut procedure, but Mr. Bevan promised that he wo arrange the dates so that before the regulations were operation the House would have an opportunity annul them. There had been already some eviden as a consequence of the publicity given to this asp of the service, of a reduction in the burden on the gene practitioner. Mr. Bevan was convinced that as service developed there would be a growing sense responsibility, and disciplines of this sort would not necessary. Mr. HASTINGS interposed to ask whet this reduction in the abuses might not make it unnecess to introduce these regulations. Mr. BEVAN replied t he was considering the possibility, for he was not anxi to burden himself with a complicated administrat machine if he could achieve the results by other mea The motion to agree with the Lords' amendment w carried by 138 votes to 9.

Adoption of Children

ON Dec. 5 the House of Commons considered t Lords' amendments to this private member's bill wh Mr. Basil Nield introduced earlier this year.[4] It is oft desirable to conceal from a natural parent the identi of the prospective adopter, and Mr. K. G. YOUNGE under-secretary of State for the Home Departmen explained that the Bill had tried to meet this difficul by introducing a form of general consent for adoptio The Lords had rejected this proposal on the groun that it was not right to encourage parents to so negle eir responsibility as simply to hand over a child to ybody who might care to adopt it. But they agreed t the actual identity of the adopter need not be closed in all cases. At the third reading of the Bill any members of the House of Commons had expressed e view that there should be greater protection for ospective adopters, but their Lordships were unable accept any proposal that consent to an adoption ould ever become irrevocable before the hearing for e final order. Though the House of Commons rejected e Lords' amendments on these two points, they bstituted a new amendment which Mr. Younger scribed as a reasonable compromise. The provision out concealing the identity of the prospective adopter s altered, and detailed procedure to this end would, r. Younger promised, be provided in Rules. A further bsection provides that once a prospective adopter s made formal application to adopt the child—and he n now do this as early as he likes in the probationary riod—a parent who has given consent to the making an adoption order is not entitled to remove the child om the care of the applicant except with the leave of e court. In considering whether to grant such leave e court is directed to have regard to the welfare of e infant. This provision, Mr. Younger held, should otect the adopter from the " irresponsible snatch-back " the child.

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[1] Davis, D. R. *Brit. med. Bull.* 1947, 5, 13.
[2] Cuthbertson, D. P., Knox, J. A. C. *J. Physiol.* 1947, 106, 42.
[3] *Lancet*, Nov. 19, p. 968.
[4] See *Lancet*, 1949, i, 419.

QUESTION TIME

Agenised Flour

Sir **Ernest Graham-Little** asked the Minister of Food what proportion of cases the national flour supplied for tional bread was bleached by the gas known as 'Agene'; ether he was aware of the danger of poisonous effects ing from this gas and that its use had now been forbidden the United States of America; and if he would take similar tion in the provision of our national bread.—Mr. **John rachey** replied: In the year 1948, 95·5% of national ur was treated with agene. As to the second and third rts of the question, I hope to be able to make a statement on on the findings of the scientific committee under the airmanship of Sir Wilson Jameson which has been reviewg the whole question of this and other flour improvers. t I should point out that even in the United States, under e most rigorous tests, agenised flour has not been found have any harmful effect upon human beings.

Maintenance Costs in Glasgow Hospitals

Mr. **James Carmichael** asked the Secretary of State for otland the average weekly maintenance cost per patient the Glasgow Infirmaries, Royal, Western, and Victoria, d in the hospitals, Stobhill, Eastern, and Southern General, ring the years 1947 and 1949, and if he would make a tement on those cases where there had been increases.— . **Arthur Woodburn** replied: I should make it clear at the figures in the appended statement are not on a mparable basis. For example, the 1949 figures include gross cost of nurses' salaries and board and lodging, ereas in 1947 the figures available only include the net cost. re has also been a very substantial increase attributable inly to increases in wages and in the salaries of nurses d other staff and including superannuation charges—which ount to nearly two-thirds of hospital expenditure—and ncreased costs for fuel and light, drugs, and food.

Hospital		*Average weekly maintenance cost per patient*						
		1947				*1949*		
		£	*s.*	*d.*		£	*s.*	*d.*
stern Infirmary, Glasgow	.. ..	10	0	1	..	13	1	11
yal Infirmary, Glasgow	.. ..	7	17	6	..	12	12	7
toria Infirmary, Glasgow	.. ..	9	13	1	..	11	0	6
bhill Hospital, Glasgow	.. ..	4	16	10	..	7	0	7
stern District Hospital, Glasgow	..	4	19	9	..	8	8	0
thern General Hospital, Glasgow	..	4	6	4	..	5	16	8

The figures for 1947 are approximate figures calculated from the ounts of three voluntary hospitals and Glasgow corporation ply by relating total cost to the number of patient-days. The res for 1949 are for the first six months of the present financial ar (April 1 to Sept. 30), and are calculated by a formula which, facilitate comparisons, seeks to eliminate the effect of variations the proportion of unoccupied beds.

The figures for 1949 include not only the cost of board and lodging ovided for resident staff, but also the gross salaries of nurses, out which cash payments in respect of board and lodging are subently received. The 1947 figures include only the net cost of aries and board and lodging. The 1949 figures of cost are thus ated by amounts which may be as much as £1 per week.

National Health Service Prescriptions

Mr. **Philip Piratin** asked whether it was the intention of the Minister of Health to levy charges for prescriptions supplied in hospitals, including those supplied in casualty wards.—Mr. **Arthur Blenkinsop** replied: No.

Mr. **Piratin** asked whether the Minister would publish evidence in his possession disclosing unnecessary resorting to doctors and chemists.—Mr. **Blenkinsop**: No.

Obituary

JOHN ORR

M.D. EDIN., F.R.C.P.E.

Dr. John Orr died in Edinburgh on Nov. 28 at the age of 78.

From George Watson's College he went to Edinburgh University where he graduated M.B. with honours in 1891. In 1894 he gained the M.R.C.P.E. and he was elected a fellow two years later. In the same year he took his M.D. After completing house-appointments at the Edinburgh Royal Infirmary he entered general practice in the south side of the city. He was quickly appreciated as a family doctor, but despite the increasing demands of his practice he found time to take an active part as a teacher in the School of Medicine of the Edinburgh Royal Colleges. As lecturer in materia medica he was an able and popular teacher, and his knowledge of the use of drugs in practice enabled him to present his subject in a practical and interesting manner. In 1925 he was elected dean of the Extra-Mural School, a position he held for 21 years.

His interest in medical education led him to give up general practice over 20 years ago, and between 1930 and 1933 he visited medical schools in Canada, the United States, and India. For many years he represented the Royal College of Physicians of Edinburgh on the board of managers of the Royal Infirmary, where his sound judgment, organising ability, and constant enthusiasm were of great value. Particularly interested in the radiological department as organiser, he watched its development into one of the foremost radiodiagnostic and radiotherapeutic institutions in the country.

A colleague writes: " John Orr was the most approachable of men and he was always willing to help students in difficulty, especially those from abroad. Destitute practitioners and refugee students from Europe, in the days before the war, received much kindly advice and a warm welcome to his hospitable home. But it was not only in medical work that John Orr found outlet for his unbounded energy. An active churchman, he was senior elder in Grange Parish Church. He was twice president of the Watsonian Club and in 1942 he was president of the Scottish Bowling Club. His love of music found practical expression in his services to the Edinburgh Concert Society where for many years he was chairman of the directors. As a tribute to his memory, on Dec. 9 the Scottish Orchestra played Variation No. 9, " Nimrod," from Elgar's *Enigma Variations*. So Edinburgh took farewell of one of her best known and respected citizens, and old students scattered all over the world will remember with affection a beloved teacher and good counsellor."

Dr. Orr is survived by his wife, a son, and two daughters.

LESLIE ALFRED HUMPHREY

M.A., M.B. CAMB., M.R.C.P.

Dr. Leslie Humphrey, who died in University College Hospital on Dec. 1 at the age of 32, was educated at Winchester College and Trinity College, Cambridge, where he took his degree in natural sciences in 1938. After qualifying from University College Hospital in 1944 he held house-appointments at the West Middlesex County Hospital and then trained as a pathologist at Ashford Hospital, Middlesex. In the R.A.M.C., with the rank of major, he was in charge of the command laboratory at the Queen Alexandra Military Hospital, Millbank. In 1946 he took the M.R.C.P. and the following year his M.B.

A friend writes: " His engaging personality and his wide interests and activities made him a charming companion, and his fine character will be a lasting example to those who knew him. He possessed a wisdom beyond his years, which gave him a sympathetic understanding of his colleagues and patients. During his long illness, which he bore with characteristic courage, he maintained his interest in the activities of his friends."

He leaves a widow and two young children.

Mr. WILLIAM ANDERSON

William Anderson approached everyone and everything with an air of confidence and purpose. His patients and assistants could not fail to respond and his work was a pleasure, therefore, to himself and all who were concerned with it. Among his many qualities, one that stood out was his capacity to be on natural terms with anyone in the shortest time. I remember, for example, how he raised shouts of joy from a student audience by telling them : " I had to sit anatomy three times, and I expect it was good for me." The statement was correct, but not in the way his audience understood it ; for his second and third sittings were undertaken to acquire the F.R.C.S., first of Edinburgh and later of London.

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He had the qualities that may be regarded as characteristic of the best type of Aberdonian : he was hard-headed and soft-hearted. As consulting surgeon to Scottish Command in the late war he proved himself an expert at reducing tangled situations to their essentials and abating the follies of war-time life with outspoken blasts of good sense, warmly and often humorously expressed. Throughout his life he did a great deal of good quietly, and his surgical interests ranged widely. " At one time I was even the honorary surgeon to the pigs at the Rowett Institute," he liked to remind his colleagues. Wherever he worked he made friends ; wherever he was known the news of his sudden death was received with deep sadness. He showed no outward signs of the strenuous life he had lived and there was every reason to suppose that he still had much to give and much to enjoy. It is our loss and grief that this expectation has been so abruptly proved wrong.

J. W. H.

It came as a great shock to many of his friends in the South to hear of the death of William Anderson, and more particularly to those of us in the Society of Thoracic Surgeons who had met him a few weeks ago in Sheffield. Anderson was one of the founder members of the society and he had always been present at our meetings at home and abroad. He had been a member of the committee from the beginning and in due course was elected president, but he only held office for a year, forgoing a further period so as not to stand in the way of younger men, an attitude that was characteristic. His views, whether on surgery or policy, were honest, sober, and forthright ; in consequence his opinion carried great weight. It was always a joy to have him with us on our visits to the various clinics, more particularly when we went abroad where his cheerful conversation lightened many a long train journey and brightened our evenings. Willie Anderson was better known to us in the South than many of his colleagues north of the border, and he will be greatly missed in our surgical circles by his many friends.

J. B. H.

Many members of the profession will have heard with regret of the death of Mr. A. LISTER HARRISON, who was a member of the board of the *Metropolitan Hospital* and of THE LANCET Commission on Nursing (1932). A nephew of Lord Lister, he was 78 years of age.

Public Health

Undiagnosed Epidemic in Italy

A PECULIAR epidemic infection is reported Stefanutti [1] from the vicinity of Foggia in Italy. onset is sudden, without any prodromal sympt and the illness lasts from two weeks to thirty days. patient, who is always a male, is usually not ill en to take to his bed, although feverish. The fev slight in the first week but higher in the second and weeks, when the temperature reaches 101-1 in the evening, though it is normal in the mor It falls by lysis. When the fever is at its highest are night sweats. The onset is characterised by cata conjunctivitis, which last a fortnight, slight sore th dry cough, anorexia, obstinate constipation, and quency of micturition, with a burning sensation in posterior urethra. There was intense frontonu headache. In at least two cases orchitis develo both testes being affected, *not simultaneously but* an interval of a few days. The testes were sw " to the size of an orange " but were painless. scrotum and spermatic cords appeared normal, swollen glands were found, and nothing abno was found in the urine. Tests for syphilis, ent fever, and Malta fever gave negative results. At time of the orchitis the blood showed slight nor chromic anæmia, a white-cell count of about 10,000 c.mm. (neutrophilia 60–65 %), and slight eosinop (4–6 %).

Poliomyelitis

During the week ended Dec. 3 notifications in Engl and Wales were : poliomyelitis 141 (176), polioence litis 15 (17). Figures for the previous week are sh in parentheses. Multiple cases (poliomyelitis and po encephalitis together) were reported from the *follow* counties :

London 16 (24), Berks 3 (3), Buckingham 2 (5), Chest (6), Essex 7 (16), Gloucester 7 (8). Hertford 2 (6), Kent (14), Lancaster 14 (10), Leicester 3 (7), Middlesex 15 (Norfolk 4 (12), Nottingham 6 (5), Oxford 2 (1), Southam 5 (4), Stafford 5 (3), Surrey 6 (6), Sussex, East 4 (3), War 6 (7), Yorks, *West Riding* 19 (17), Glamorgan 6 (5).

Appointments

BARRON, J. N., M.B. N.Z., F.R.C.S.E. : director, plastic and injury unit, Odstock Hospital, Salisbury.
CHARLTON, E. P. H., M.D. Durh., D.P.M. : consultant psychia and deputy medical superintendent, *Graylingwell* Hosp Chichester.
CRAWSHAW, D. G., M.B. Manc., D.C.H., D.P.H. : M.O.H., Peterboro
DONALDSON, R. J., M.B. Belf., D.P.H. : deputy M.O.H. and de school M.O., Northampton.
DRAPER, R. W., M.B. Edin. : surgical officer (B1), Edenhall Hosp Musselburgh.
HINDE, R. T., F.R.C.S. : asst. ear, nose, and throat surgeon, Ex clinical area.
HUMPHREYS, MAIR, M.B. Lpool : asst. county M.O.H. and school M.O., Anglesey.
LLOYD, T. W., D.M. Oxfd, M.R.C.P. : medical superintendent consultant chest physician, South Worcestershire group hospitals and St. Wulstan's Hospital, Malvern.
MACAULAY, D. B., M.B. Lpool, M.R.C.P. : visiting physician, Bo General Hospital.
ODELL, J. R., M.B. Lond., D.A. : first assistant, anæsthetics de Royal Free Hospital, London.
ROCHE, G. K. T., M.B. Lond., D.A. : consultant anæsthetist, Ro National Orthopædic Hospital, London.
RODGER, WILLIAM, M.B. Glasg., D.P.H. : M.O.H., Coatbridge.
SIMMONS, ERNEST, M.D. Bonn : *consultant* child psychiatr North Wales area.
STANSFIELD, R. N., M.R.C.S. : asst. psychiatrist, Herrison Hosp Dorchester, Dorset.
TIBBETTS, R. W., M.A., B.M. *Oxfd*, D.P.M. : psychiatrist (S.H.M grade), Graylingwell Hospital, Chichester.
WEIR, J. H., M.D., B.HY. Durh., D.P.H. : M.O.H., Kensington a Chelsea.

***Appointed Factory Doctors* under the Factories Acts:**

GEOHEGAN, P. J., M.B. N.U.I. : Crowland district, Lincs.
GILL, J. M. C., M.B. Aberd. : Inverurie district, Aberdeenshire.
HOLMES, E. A., M.R.C.S. : Peterborough district.
PLATTEN, M. C., M.A. Camb., M.B. Birm. : Meriden distri Warwickshire.

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[1] Stefanutti, P. *Policlinico*, sez. prat. 1949, 56, 1185.

Notes and News

HEBERDEN SOCIETY

At a meeting of this society at the Royal College of Surgeons Dec. 10 the following officers for 1950 were elected: presi-it, chairman, and librarian, Dr. W. S. C. Copeman; presi-t-elect, Sir Henry Cohen; treasurer, Dr. Ernest Fletcher; or hon. secretary, Dr. R. M. Mason; junior hon. secretary, F. Dudley Hart. The other members of the executive 'ttee are Dr. Hugh Burt, Dr. E. G. L. Bywaters, Mr. W. D. tart, Dr. G. D. Kersley, Dr. L. G. C. Pugh, and Prof. R. E. bridge. The Heberden oration was delivered by Prof. F. od Jones, F.R.S., who spoke on Classical Gout.

At the annual dinner held at the college the same evening toast of The Guests, proposed by Dr. Mason, drew a nse from Lord Lucas of Chilworth, captain of the King's lyguard of the Yeoman of the Guard. Lord Webb-Johnson, foot from Canada, said that rheumatism was one of the st serious diseases affecting the Commonwealth. Heberden l been one of the great clinicians; but today the art of mining the patient was, he feared, in danger of being lost. e great clinical teaching in the English schools had, he ught, originated in the Irish schools in the days of Graves l Stokes, and Britain still had men who were showing—James Mackenzie showed—how much could be learnt by enthusiasm of a keen observer. Though a visit to America t one envious, it should not be forgotten that the fundantal discoveries had mostly emanated from this country. . Copeman, responding as chairman, said that this annual eeting completed the Heberden Society's 13th year. It ntinued to prosper, and with membership limited to 100 l a long waiting-list. The "Heberden round" had been d at Oxford under the auspices of Prof. L. J. Witts, and xt year new ground would be broken by holding the round Paris on the invitation of Prof. F. Coste, the one and only fessor of rheumatic diseases in the world. The society had en represented at the International Congress on Rheumatic eases held in New York, when Dr. Philip Hench, one of the iety's two honorary members, reported his work on ortisone.' Dr. Copeman concluded by presenting the berden medal to Professor Wood Jones, whom he described the greatest living anatomist, and the medallist very briefly ressed his thanks.

Next day, at St. Thomas's Hospital, Prof. D. V. Davies ned a discussion on Anatomical Aspects of the Rheumatic eases, speaking particularly of the vascular pattern and ve-supply of joints. Dr. W. A. Fell contributed a paper ling with the relation between referred pain and lesions in ferent parts of the joint capsule.

THE RETURN JOURNEY

Boadicea was not the exceptional woman we are apt think her. In her day women were on an equal footing h men, and Caesar himself noted that among the Gauls l Britons no distinction of sex was made in places of nmand or government. In Saxon England women conued to share the rights as well as the responsibilities of n—took part in national and local moots as landowners l burgesses, were largely responsible for the conversion the land to Christianity, and were at the head of many gious houses, ranking just below bishops. In a just but rant book,[1] Miss Ethel M. Wood traces for us the decline the status of women which began with the Norman Conest and reached its nadir in 1832, when the Reform Act prived them finally and legally of the right to vote. Until it time, though the right of women to use the vote had en been challenged, there was no lawful way of preventing em from doing so if they chose; most of them were too pressed to choose. It took nearly a hundred years to win ck that lost political right—years in which a fictitious ture of woman, not as a comrade and counsellor, taking ual responsibility with men, but as a dependent, physically d intellectually, inferior, a modest perpetual parasite, s constantly set before each rising generation of girls. ollope could write of a rich young widow, about to marry ain, "She would give up the heavy burden of her dependence, and once more assume the position of a man . . ."—a position which like a point in geometry d place but no magnitude. What she might do, and what she might not do, were rigidly controlled unless of course she was a working woman—or a lady without means, in which case she became a governess despised by all. In this dark age of frustrate women a few intelligent and sturdy ones saw clearly and broke a way out of prison for the rest. Miss Wood glances at the careers of some of them—Mary Wollstonecraft, Elizabeth Fry, Josephine Butler, Elizabeth Garrett Anderson, Sophia Jex-Blake, Florence Nightingale, and Octavia Hill among them. Fortunately, most of them were long-lived and did a good deal with their time; they needed to be, for in addition to the steady opposition of men (a few liberal minds excepted) they had to contend with the apathy, and even the opposition, of women. It is a strange story, told gaily; and it reminds us that the long fight for fair-dealing is still going on. Women, with great difficulty, won back the franchise; they have not yet recovered the right to equal pay for equal work which they enjoyed in ancient Ireland or the equality of opportunity which the great English trade gilds accorded them.

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[1] The Pilgrimage of Perseverance. ETHEL M. WOOD. London: The National Council of Social Service. 1949. Pp. 90. 6s.

University of Cambridge

Dr. Leslie Cole, F.R.C.P., senior physician to Addenbrooke's Hospital, has been elected to a supernumerary fellowship at King's College.

University of Bristol

The Carey Coombs prize for 1949 has been awarded to Dr. I. McD. Stewart for an essay on the Ætiology of Coronary Thrombosis.

University of Dublin

On Dec. 8 at the school of physic, Trinity College, the following degrees were conferred:

M.D.—W. E. R. Hackett, F. J. C. Loughran, J. D. McKeever, Irene S. Orgel.

M.B., B.Ch., B.A.O.—J. H. Ashmore, Evelyn Browne, Joan I. Buchanan, L. J. Clein, Margaret B. E. Ellis, E. G. England, R. C. Gray, R. ft. Jackson, Vyvyan I. K. Johnston, O. H. Killen, W. A. McGaw, E. B. McHugh, Sheilagh M. McHugh, W. D. McNaul, T. T. E. Michael, E. V. Page, Ruth M. Perrott, Gwendoline G. L. Poots, W. D. H. Powell, R. N. Siberry, B. A. McC. Thompson F. A. Walkey.

L.M.S.—B. J. O'Reilly.

Royal College of Surgeons of England

At a meeting of the council held on Dec. 8 with Sir Cecil Wakeley, the president, in the chair, Sir Harry Platt was appointed Bradshaw lecturer for 1950. Hunterian professorships were awarded to Prof. Milroy Paul, of Ceylon, and Mr. R. T. Johnson, of Manchester.

Mr. D. N. Matthews was elected a member of the surgical section of the board of examiners in dental surgery, and Mr. C. C. Hentschel an examiner in elementary biology under the Conjoint Board. The following examiners were appointed for the primary fellowship examination to be held in Ceylon, India, and Pakistan: Sir Gordon Gordon-Taylor (anatomy); Prof. Geoffrey Hadfield (pathology), and Prof. A. St. G. Huggett (physiology).

Diplomas of fellowship were granted to the following:

J. L. Reid, G. D. Channell, J. C. Watts, I. A. Donaldson, Raymond
[illegible] Rogers, F. S. Gorrill, F. A. Henley,
[illegible] R. C. Jack, D. O. Williams, J. S.
[illegible] A. Ripman, D. A. Langley, M. G.
Wilson, J. P. Mitchell, D. L. Evans, M. P. Durham, J. W. Betts,
F. T. Graves, G. S. [illegible] Farrar, B. H. Hand,
D. W. Thomas, M. [illegible] B. V. Jones, R. W.
Tudor, V. S. Brook [illegible] own, A. W. Nurick,
I. P. Todd, I. B. S [illegible] H. Bennett, N. J.
Blockey, A. G. Dingley, P. N. Robson, J. F. Bolton Carter, M. C. T.
Reilly, Charles Taylor, [illegible] Radwan,
A. J. Clyne, W. W. Da [illegible] A. Powys,
S. A. Bond, J. N. Apple [illegible] ohammed
Omar, T. G. Barlow, R. [illegible] El Sayed
Higazi, Gurijala Pattabhi Ramayya, T. G. Cameron, W. W. Hallwright, Lansell Bonnin, R. R. Dickson, P. H. Greenwell, J. S. Guest,
Leslie Jayasuriya, R. C. P [illegible] Thomson,
A. J. Alldred, Joseph Bl [illegible] R. C.
Evans, B. P. Flannery, [illegible] T. W.
Henson, T. P. Morley, [illegible] M. I.
Symonds, Derek Ainslie, Allan Clain, P. R. R. Clarke, Chandra Pal de Fonseka, John Hewet, D. A. Macfarlane, A. B. Mackenzie, W. J. McLaren, I. W. MacPhee, T. H. L. Rosser, C. L. Tucker, L. S. Walsh, J. A. Baird, H. D. W. Black, A. F. Bromwich, M. F. Butler, J. F. Dark, N. C. Davis, J. D. K. Dawes, W. R. Laug, W. A. Liddell. Nanalal Jivan Shah, D. B. Caro, D. H. Keller, D. N. Ross, A. G. Parks.

Hospital Festivities at Christmas

An Exchequer contribution towards the cost of these festivities at the rate of 5*s.* per head of patients and resident staff has been authorised again this year.

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Public Health

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Appointments

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CHARLTON, E. P. H., M.D. Durh., D.P.M.: consultant psych and deputy medical superintendent, Graylingwell Ho Chichester.

CRAWSHAW, D. G., M.B. Manc., D.C.H., D.P.H.: M.O.H., Peterbor

DONALDSON, R. J., M.B. Belf., D.P.H.: deputy M.O.H. and de school M.O., Northampton.

DRAPER, R. W., M.B. Edin.: surgical officer (B1), Edenhall Ho Musselburgh.

HINDE, R. T., F.R.C.S.: asst. ear, nose, and throat surgeon, E clinical area.

HUMPHREYS, MAIR, M.B. Lpool: asst. county M.O.H. and school M.O., Anglesey.

LLOYD, T. W., D.M. Oxfd, M.R.C.P.: medical superintendent consultant chest physician, South Worcestershire grou hospitals and St. Wulstan's Hospital, Malvern.

MACAULAY, D. B., M.B. Lpool, M.R.C.P.: visiting physician, B General Hospital.

ODELL, J. R., M.B. Lond., D.A.: first assistant, anæsthetic d Royal Free Hospital, London.

ROCHE, G. K. T., M.B. Lond., D.A.: consultant anæsthetist, R National Orthopædic Hospital, London.

RODGER, WILLIAM, M.B. Glasg., D.P.H.: M.O.H., Coatbridge.

SIMMONS, ERNEST, M.D. Bonn: consultant child psychiat North Wales area.

STANSFIELD, R. N., M.R.C.S.: asst. psychiatrist, Herrison Hosp Dorchester, Dorset.

TIBBETTS, R. W., M.A., B.M. Oxfd, D.P.M.: psychiatrist (S.H. grade), Graylingwell Hospital, Chichester.

WEIR, J. H., M.D., B.HY. Durh., D.P.H.: M.O.H., Kensington Chelsea.

Appointed Factory Doctors under the Factories Acts:

GEOHEGAN, P. J., M.B. N.U.I.: Crowland district, Lincs.

GILL, J. M. C., M.B. Aberd.: Inverurie district, Aberdeenshire

HOLMES, E. A., M.R.C.S.: Peterborough district.

PLATTEN, M. C., M.A. Camb., M.B. Birm.: Meriden distr Warwickshire.

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[1] Stefanutti, P. *Policlinico*, sez. prat. 1949, 56, 1185.

Notes and News

HEBERDEN SOCIETY

a meeting of this society at the Royal College of Surgeons ·e. 10 the following officers for 1950 were elected: presi- chairman, and librarian, Dr. W. S. C. Copeman; presi- , Sir Henry Cohen; treasurer, Dr. Ernest Fletcher; hon. secretary, Dr. R. M. Mason; junior hon. secretary, . Dudley Hart. The other members of the executive are Dr. Hugh Burt, Dr. E. G. L. Bywaters, Mr. W. D. Dr. G. D. Kersley, Dr. L. G. C. Pugh, and Prof. R. E. ge. The Heberden oration was delivered by Prof. F. Jones, F.R.S., who spoke on Classical Gout.

the annual dinner held at the college the same evening oast of The Guests, proposed by Dr. Mason, drew a from Lord Lucas of Chilworth, captain of the King's of the Yeoman of the Guard. Lord Webb-Johnson, from Canada, said that rheumatism was one of the serious diseases affecting the Commonwealth. Heberden een one of the great clinicians; but today the art of the patient was, he feared, in danger of being lost. reat clinical teaching in the English schools had, he originated in the Irish schools in the days of Graves tokes, and Britain still had men who were showing—mes Mackenzie showed—how much could be learnt by sm of a keen observer. Though a visit to America ne envious, it should not be forgotten that the funda- l discoveries had mostly emanated from this country. opeman, responding as chairman, said that this annual ng completed the Heberden Society's 13th year. It ued to prosper, and with membership limited to 100 long waiting-list. The "Heberden round" had been at Oxford under the auspices of Prof. L. J. Witts, and year new ground would be broken by holding the round is on the invitation of Prof. F. Coste, the one and only sor of rheumatic diseases in the world. The society had represented at the International Congress on Rheumatic es held in New York, when Dr. Philip Hench, one of the y's two honorary members, reported his work on sone.' Dr. Copeman concluded by presenting the den medal to Professor Wood Jones, whom he described greatest living anatomist, and the medallist very briefly ssed his thanks.

t day, at St. Thomas's Hospital, Prof. D. V. Davies d a discussion on Anatomical Aspects of the Rheumatic es, speaking particularly of the vascular pattern and supply of joints. Dr. W. A. Fell contributed a paper g with the relation between referred pain and lesions in nt parts of the joint capsule.

THE RETURN JOURNEY

dicea was not the exceptional woman we are apt nk her. In her day women were on an equal footing nen, and Caesar himself noted that among the Gauls Britons no distinction of sex was made in places of and or government. In Saxon England women con- l to share the rights as well as the responsibilities of -took part in national and local moots as landowners urgesses, were largely responsible for the conversion land to Christianity, and were at the head of many us houses, ranking just below bishops. In a just but nt book,[1] Miss Ethel M. Wood traces for us the decline status of women which began with the Norman Con- and reached its nadir in 1832, when the Reform Act ed them finally and legally of the right to vote. Until ime, though the right of women to use the vote had been challenged, there was no lawful way of preventing from doing so if they chose; most of them were too ssed to choose. It took nearly a hundred years to win that lost political right—years in which a fictitious e of woman, not as a comrade and counsellor, taking responsibility with men, but as a dependent, physically intellectually, inferior, a modest perpetual parasite, constantly set before each rising generation of girls. pe could write of a rich young widow, about to marry , "She would give up the heavy burden of her endence, and once more assume the position of a n . . ."—a position which like a point in geometry lace but no magnitude. What she might do, and what she might not do, were rigidly controlled unless of course she was a working woman—or a lady without means, in which case she became a governess despised by all. In this dark age of frustrate women a few intelligent and sturdy ones saw clearly and broke a way out of prison for the rest. Miss Wood glances at the careers of some of them—Mary Wollstonecraft, Elizabeth Fry, Josephine Butler, Elizabeth Garrett Anderson, Sophia Jex-Blake, Florence Nightingale, and Octavia Hill among them. Fortunately, most of them were long-lived and did a good deal with their time; they needed to be, for in addition to the steady opposition of men (a few liberal minds excepted) they had to contend with the apathy, and even the opposition, of women. It is a strange story, told gaily; and it reminds us that the long fight for fair-dealing is still going on. Women, with great difficulty, won back the franchise; they have not yet recovered the right to equal pay for equal work which they enjoyed in ancient Ireland or the equality of opportunity which the great English trade gilds accorded them.

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[1] e Pilgrimage of Perseverance. ETHEL M. WOOD. London: he National Council of Social Service. 1949. Pp. 90. 6s.

University of Cambridge

Dr. Leslie Cole, F.R.C.P., senior physician to Addenbrooke's Hospital, has been elected to a supernumerary fellowship at King's College.

University of Bristol

The Carey Coombs prize for 1949 has been awarded to Dr. I. McD. Stewart for an essay on the Ætiology of Coronary Thrombosis.

University of Dublin

On Dec. 8 at the school of physic, Trinity College, the following degrees were conferred:

M.D.—W. E. R. Hackett, F. J. C. Loughran, J. D. McKeever, Irene S. Orgel.

M.B., B.Ch., B.A.O.—J. H. Ashmore, Evelyn Browne, Joan I. Buchanan, L. J. Clein, Margaret B. E. Ellis, E. G. England, R. C. Gray, R. ff. Jackson, Vyvyan I. K. Johnston, O. H. Killen, W. A. McGaw, E. B. McHugh, Sheilagh M. McHugh, W. D. McNaul, T. T. E. Michael, E. V. Page, Ruth M. Perrott, Gwendoline G. L. Poots, W. D. H. Powell, R. N. Siberry, B. A. McC. Thompson F. A. Walkey.

L.M.S.—B. J. O'Reilly.

Royal College of Surgeons of England

At a meeting of the council held on Dec. 8 with Sir Cecil Wakeley, the president, in the chair, Sir Harry Platt was appointed Bradshaw lecturer for 1950. Hunterian professorships were awarded to Prof. Milroy Paul, of Ceylon, and Mr. R. T. Johnson, of Manchester.

Mr. D. N. Matthews was elected a member of the surgical section of the board of examiners in dental surgery, and Mr. C. C. Hentschel an examiner in elementary biology under the Conjoint Board. The following examiners were appointed for the primary fellowship examination to be held in Ceylon, India, and Pakistan: Sir Gordon Gordon-Taylor (anatomy); Prof. Geoffrey Hadfield (pathology), and Prof. A. St. G. Huggett (physiology).

Diplomas of fellowship were granted to the following:

J. L. Reid, G. D. Channell, J. C. Watts, I. A. Donaldson, Raymond Ramsay, Bernard Fairburn, N. C. Rogers, F. S. Gorrill, F. A. Henley, Sundram Pillai, L. A. Atkinson, R. C. Jack, D. O. Williams, J. S. Tomkinson, A. E. Howarth, H. A. Ripman, D. A. Langley, M. G. Wilson, J. P. Mitchell, D. L. Evans, M. P. Durham, J. W. Betts, F. T. Graves, G. S. Ramsay, F. R. Sutton, D. A. T. Farrar, B. H. Hand, D. W. Thomas, M. O. Carruthers, Keith Chitty, B. V. Jones, R. W. Tudor, V. S. Brookes, D. A. C. Reid, Austin Brown, A. W. Nurick, I. P. Todd, I. B. Smith, J. S. R. Golding, A. M. H. Bennett, N. J. Blockey, A. G. Dingley, P. N. Robson, J. F. Bolton Carter, M. C. T. Reilly, Charles Taylor, Rashed Iskander, Mahmoud Ahmed Radwan, A. J. Clyne, W. W. Davey, Man Mohan Nath, Marjorie A. Powys, S. A. Bond, J. N. Appleton, W. M. Manchester, Bekhit Mohammed Omar, T. G. Barlow, R. D. Condon, H. H. Gilbert, Hussni El Sayed Higazi, Gurijala Pattabhi Ramayya, T. G. Cameron, W. W. Hallwright, Lansell Bonnin, R. R. Dickson, P. H. Greenwell, J. S. Guest, Leslie Jayasuriya, R. C. R. Loane, A. F. Murphy, E. R. W. Thomson, A. J. Alldred, Joseph Block, P. W. Cotter, Charles Dundon, R. C. Evans, B. P. Flannery, F. E. J. Gabel, A. J. Gunning, G. F. T. W. Henson, T. P. Morley, Roshun Patuck, Anthony Roper, M. I. Symonds, Derek Ainslie, Allan Clain, P. R. R. Clarke, Chandra Pal de Fonseka, John Hewet, D. A. Macfarlane, A. B. Mackenzie, W. J. McLaren, I. W. MacPhee, T. H. L. Rosser, C. L. Tucker, L. S. Walsh, J. A. Baird, H. D. W. Black, A. F. Bromwich, M. F. Butler, J. F. Dark, N. C. Davis, J. D. K. Dawes, W. R. Lang, W. A. Liddell, Nanalal Jivan Shah, D. B. Caro, D. H. Keller, D. N. Ross, A. G. Parks.

Hospital Festivities at Christmas

An Exchequer contribution towards the cost of these festivities at the rate of 5s. per head of patients and resident staff has been authorised again this year.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Dec. 1, Sir David Henderson was elected president for the ensuing year. The following were elected to be members of council: Dr. W. A. Alexander, Dr. J. D. S. Cameron, Dr. T. Douglas Inch, Dr. Ian G. W. Hill, Dr. James G. M. Hamilton, and Dr. A. Colin P. Campbell. Dr. Alexander was nominated vice-president.

Editorship of the J.A.M.A.

Dr. Austin Smith is reported by B.U.P. to have succeeded on Dec. 6 to this appointment, from which Dr. Morris Fishbein retired on Dec. 1.

Institute of Child Health

Dr. T. P. Mann has been appointed assistant to the professor of child health at the *Institute of Child Health, University* of London, for work in the newborn-baby department at the Postgraduate Medical School of London.

British Association of Physical Medicine

A course of lectures for candidates preparing for part II of the diploma in physical medicine will be held on Tuesdays and Thursdays, from Jan. 3 to Feb. 9, at 5 P.M. Further details can be had from the honorary secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

London School of Hygiene & Tropical Medicine

Prof. N. H. Swellengrebel, director of the department of tropical hygiene at the Royal Institute for the Indies, Amsterdam, will give two lectures in January at the school, Keppel Street, W.C.1. On Tuesday, 17th, he will speak on Plague in Java, and on Wednesday, 18th, on How the Malaria Service in Indonesia Came into Being. Both lectures will be held at 2 P.M.

Congress on Criminology

The second International Congress on Criminology is to be held in Paris from Sept. 7 to 14, under the presidency of Prof. Donnedieu de Vabres. The representatives for the United Kingdom are Dr. Denis Carroll and Mr. Hermann Mannheim, DR. JURIS. Further particulars may be had from the organising secretary, c/o Institute for the Scientific Treatment of Delinquency, 8, Bourdon Street, London, W.1.

Form E.C.1 *(Revised)*

To reduce *inflation of doctors' lists in the registers of* executive councils, a revised form E.C.1 is to be introduced on Jan. 1. This revised form can be used either for a first application to be placed on a doctor's list or for transfer to another doctor when the medical card is missing. Supplies of the form will be obtainable only at executive-council offices and doctors' surgeries, and (on the *registration of a birth) from* the registrar of births.

Mr. Ewing on the National Health Service

Mr. Oscar R. Ewing, United States federal security administrator, and author of the Ewing report on *The Nation's Health* (see *Lancet*, 1948, ii, 574), spent last week in London, where he saw the Prime Minister and other members of the Government as well as others concerned with health, education, and social insurance. At a press conference on Friday, reported in the *Times*, he spoke of President Truman's request to Congress to enact a national health insurance programme to cover all citizens. "I can now see that most of the critics of our proposal in the United States have, whether deliberately or through ignorance, tried to mislead the American people on the facts about the British programme. It seems to me that this programme is working remarkably well, and that it is a good thing for Britain. This is what we have been told by people representing all shades of political opinion, as well as by most of the physicians with whom we have talked." He had, he added, been horrified to learn that "certain groups in organised American medicine who are opposing health *insurance* in the United States have been contributing financially to support the propaganda activities of a small group of die-hard British doctors still fighting the health programme here." He regarded this as unfair and dangerous interference.

Mr. Ewing and his associates have since been to Eire and Scotland, and are going on to Sweden, Switzerland, Italy, and Israel.

International Hæmophilia Society

A general meeting of the society will be held at the Soci for Visiting Scientists, 5, Old *Burlington Street*, Piccadi London, S.W.1, *on* Sunday, Dec. 18, at 2.30–5 P.M. Doct and hæmophilics or their representatives are invited to atte Communications should be *addressed to the society* the Galton Laboratory, University College, Gower Str London, W.C.1.

Liverpool Regional Hospital Board

At a meeting on Dec. 1 this board agreed that as a lo term policy sufficient accommodation should be provided obstetric units for at least three-quarters of the births in region, and that in gynæcological units ample provis should be made for cases of abortion. The board also approv in principle a recommendation by the Chester and dist hospital management committee that maternity accommo tion in the Runcorn area should be made available to gene practitioners.

The board considered a request by the faculty of medic of the university that opportunities should be afforded sixth-year students to see emergency work in hospita and the board have decided that in the first instance facilit should be afforded for students to see emergency operatic *at four hospitals in the region.*

A verbatim report of the Second Commonwealth a Empire Health and Tuberculosis Conference, held in Lond last July, has been published by the National Associati for the Prevention of Tuberculosis. Copies (15*s*. *each*) m be obtained from the association, Tavistock House Nort Tavistock Square, London, W.C.1.

The Central Council for District Nursing in London ha revised their Directory of District Nursing and Streets Lis for London. Copies, price 3*s*. each, may be had *from* t council, 25, Cockspur Street, London, S.W.1.

Diary of the Week

DEC. 18–24

Tuesday, 20th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Mr. R. J. Last: The Larynx. (Arnott *demonstration*

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Mr. A. K. *Monro*: *Treatment of* Varicose Conditions
the Lower Limb.

EDINBUR [illegible] OR MEDICINE
5 P.M. [illegible] Teviot Place.) *Prof. Cliffor*
Problems in Renal Diseas

Births, Marriages, and Deaths

BIRTHS

ANDREW.—On Dec. 8, in Manchester, the wife of Dr. S. S. Andre —a daughter.

BURSLEM.—On Nov. 30, in Chester, the wife of Dr. R. W. Burslem— a son.

HOVENDEN.—On Dec. 5, the wife of Dr. Geoffrey Hovenden— daughter.

MORRIS.—On Dec. 3, in Dublin, the wife of *Dr. L. E.* Morris— a daughter.

NIGHTINGALE.—On Dec. 8, the wife of Dr. J. A. Nightingale— *daughter.*

PRITCHARD.—On Dec. 6, the wife of Dr. John Pritchard—*a daughte*

RICKFORD.—On Dec. 4, in London, the wife *of Mr. Braithwait* Rickford, F.R.C.S.—a son.

DEATHS

JONES.—On Dec. 5, at Rhyl, Edward Hugh Jones, M.D., C.M. Edin. aged 81.

JONES.—On Dec. 3, in *Manchester*, John Grant Jones, M.D. *Aberd.* *aged* 77.

MACFAUL.—*On Dec.* 7, *at* Leigh, Lancs, Alexander MacFaul, M.B. Belf.

MCKINSTRY.—On Dec. 7, William Kilbourn McKinstry, M.A. Camb., M.R.C.S., aged 50.

MUNRO.—On Dec. 8, in *London*, Hector Munro, M.B. *Aberd.*

OGG.—On Dec. 5, in London, Theodore *Alexander* William Ogg, M.D. Lausanne.

RUSSELL.—On Dec. 6, at Crowborough, Sir Michael Russell, K.C.M.G., C.B., M.R.C.S., aged 89.

FAMILY DOCTOR

IMPACT OF MODERN THERAPEUTIC IDEAS ON GENERAL PRACTICE *

R. J. PERRING
M.D. Durh.

PIRATION to the art of healing is as old as the ry of man, but it is only within the last hundred s or so that the first tentative shoots of modern cal science have burst through the superstition and ricism remaining from medieval times—an age when profession thought it better for a patient to die rding to the rules than to live by violating them. 1849 the foundations of anatomy and pathology been well laid, but the great names of Louis Pasteur Joseph Lister (and all they stood for) were as yet own in the land. Medical practitioners still shambled trotted along the old paths, dividing themselves rding to their fancy into either "strengtheners" or rerers," for the heroic times of copious bleeding blistering had not yet departed. It was not until that the Medical Act transferred to the General ical Council the responsibility of deciding who should rmitted to practise. Hitherto the high standard up to the public mind by the Royal College of sicians had not prevented quackery from having xcellent time of it: for, since professional practice isted mainly in the administration of a great many s. the public inferred that they might be better with more drugs still, if these could be got cheap ch. and therefore swallowed large cubic measures hysic prescribed by unscrupulous ignorance which taken no degrees. In 1878 George Eliot could still e:

> "With our present medical rules and education, one st be satisfied now and then to meet with a fair prac- ner. As to the higher questions which determine the rting point of a diagnosis—as to the philosophy of dical evidence—any glimmering of these can only come m a scientific culture of which country practitioners ve no more notion than the man in the moon."

medical man was still on the lower rungs of the social er. To quote from the same author:

> "I prefer a medical man more on a footing with the vants. They are often all the cleverer. I assure you found my old doctor's judgment unfailing. He was rse and butcherlike but he knew my constitution."

e latter half of the 19th century was, of course, great age of Victorian industrialism. Labour from countryside, tempted by the relatively large wages, d into the already swollen towns, bringing with it wn quota of disease. Preventive medicine was only s infancy, and contamination of water-supplies, crowding, too long working hours, and an ill-adapted ry brought increasing toil to the ill-equipped prac- ter. But in the end the human conscience and an intelligence gradually overcame the inertia of rvatism and ignorance. And as decade followed de it became obvious that, without outside assistance, family doctor could no longer supply the needs of patient; for these now included laboratory tests hemical and bacteriological), radiography, and other ialised non-clinical services. As the health of the munity is a national asset, it became obvious that e devolved upon the State the duty of providing cal attention on a large scale. The National Health rance Act of 1911 was the first step in this direction. the Ministry of Health, set up in 1919, interpreted more widely the responsibility of a government for health and well-being of its citizens.

Here then is the first application in a large way of the principle of economic security as a therapeutic agent. Since these now far-off days the social conscience has been still further stimulated, and we are now launched for better or worse upon the full-scale programme of the National Health Service. Whether this will oust the family doctor from his valued place in the community depends, in my opinion, first and last upon the man himself.

CHANGES IN DISEASE

My purpose here is to recall some of the great changes in the practice of medicine which have occurred in my own experience—i.e., within the last 28 years.

It is a most surprising thing that in the 1916 edition of Osler's *Principles and Practice of Medicine*, the book from which I originally learnt my medicine, there is no mention of the word "vitamin." The ætiology of so common a disease as rickets hung insecurely upon such vague and insubstantial pegs as poor feeding, lack of sunlight, bad ventilation, and faulty assimilation of lime salts. By the early 1920s, however, knowledge of the accessory food factors had widened. Vitamin D had been differentiated from vitamin A and later synthesised by the irradiation of ergosterol. I have not seen a case of florid rickets for more than 20 years; for the pale, fat, and flabby infant with pot-belly and bending bones, ready victim of any chance infection, has passed unregretted into obscurity. Hitherto the children's clinics, particularly in the cities, had been crowded with victims of this malady. Grosser forms of bow-legs and knock-knees were to be seen on the operating-table, while any maternity hospital could show grim evidence of the late effects. In terms of human suffering and morbidity, the discovery of vitamin D, with its application to the treatment and prevention of rickets, must be considered the major event in the therapeutic history of this century.

About this time we had with us the problem of baby feeding. This, as a problem, has generally speaking disappeared, for with the concept of neonatal sepsis there has been a general shift in emphasis from the food to the baby. Antenatal supervision and improved midwifery have done much to mitigate this trouble, while Prof. J. C. Spence's work in the Old "Babies Hospital" at Newcastle, applying to theory the practical politics of barrier nursing, produced a big fall in the death-rate of cases of congenital pyloric stenosis which had come to operation.

So much for what has gone. What diseases, on the other hand, have appeared? Again, to my surprise, very few. I must emphasise that, speaking as a general practitioner, I take no notice of the numerous oddities which occasionally appear, to be seen perhaps once in a lifetime, or of the fairly common syndromes whose cause has been narrowed down to one or two familiar factors. Here I have in mind sciatica and that anatomical nuisance the nucleus pulposus.

In 1927 W. J. Adie lectured to our society on Some Sudden Attacks of Nervous Origin. I heard then for the first time of "spontaneous subarachnoid hæmorrhage." A year later I saw my first case.

I remember it very well, for the patient was my sister. It was the usual story—sudden severe headache, vomiting, and loss of consciousness. Some 20 hours later, a lumbar puncture was done and in a matter of minutes, as the intracranial pressure was reduced, the patient regained consciousness. I have seen quite a lot of cases since, but I have not seen one which has survived a second major attack.

NEW REMEDIES

The main changes, so far as medicine is concerned, have been in the ever-increasing number of really valuable therapeutic agents at our disposal. In my early years we had no phenobarbitone (a drug now so popular and elusive that it achieved the supreme distinction of being mentioned in the ITMA programme), no ephedrine, no insulin, no ‘Anahæmin,’ no mercurial diuretics, no Maclean's powder—*not* even ‘Lucozade.’ I find it difficult to remember what on earth we did use. Bromides, certainly, and usually, if one recalled the teaching of one's student days, in conjunction with magnesium sulphate; for this particular recipe was highly esteemed in the gynæcological department of the Royal Victoria Infirmary, where Professor Ranken-Lyle tried to teach us to recognise on sight a type of patient he called the “flat-faced neurotic”—a type known nowadays by the less picturesque and more euphemistic term “chronic anxiety state.”

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* dential address delivered before the Newcastle upon Tyne and Northern Counties Medical Society on Oct. 6, 1949.

Purgatives, after centuries of use, were still riding high on a wave of enthusiasm; for the theory of “auto-intoxication from the large bowel,” originated by Arbuthnot Lane and stimulated by the plausible circular or blatant advertisement of the various commercial agencies, was, like King Charles II, “an unconscionable time a-dying.” Passing, too, were the days of polypharmacy; for the old blunderbuss prescription, as fanciful in its concept as a mathematical formula, was giving way slowly but inevitably before the more prosaic and utilitarian ideas of the National Health Insurance formulary. The theory of focal sepsis was even then dragging its slow length along, gathering into itself countless thousands of teeth, tonsils, gall-bladders, and colons—for the most part poor useless sacrifices.

But such things were mere fashionable trends. Scientific research was pushing on vigorously, and 1923 brought us the discovery of insulin. This was of course a major event, and needs no comment from me, except perhaps to remark in passing on the comparative rarity of diabetic coma.

1927 placed the treatment of pernicious anæmia on a rational basis. Many of us can remember three phases. In the first, this disease was recognised as invariably fatal, though with intermissions: it was treated by increasing doses of liquor arsenicalis, rest in bed, and a general hope for the best outlook. In the second phase, after Minot and Murphy's discovery but before the introduction of the liver extracts, patients had to eat half a pound of liver a day—a terrible ordeal and a stern test of endurance. (I remember one old lady who minced her daily ration, suspended it in burgundy, and drank it as a sort of cocktail.) The third phase, the parenteral injection of the liver extracts, is familiar to us all.

In this connexion, I must not forget to mention the pioneer work of Dr. C. C. Ungley in the treatment of subacute combined degeneration of the cord. I am still treating with fortnightly injections one old lady who unfortunately contracted “subacute combined” about 17 years ago—that is, towards the end of the second period. Her arms and legs were for all practical purposes useless and she was bedridden. After she had eaten liver daily for 12 months, stomach and soul rebelled, and so, at the instigation of Dr. Ungley, I began to inject her with ‘Campolon’ 10 ml. three times a week. This went on for years; but her arms and legs became gradually less numb and more useful, so that now, with the aid of crutches and at the age of 74, she manages to do quite a lot of light housework.

But important as such discoveries were, they made no appreciable difference to the work of a general practitioner; for such diseases could hardly be described as “common” in any one practice. The big change came with the discovery of the sulphonamide drugs, for in these we had a weapon with which to attack, in no uncertain fashion, a variety of diseases which had caused us considerable anxiety. I think particularly of lobar pneumonia, erysipelas, *Bacterium coli* infections, and streptococcal throats.

Pneumonia was one of the most widespread and fatal of all acute diseases, and had become—to borrow a phrase used by John Bunyan of consumption—“ c of the men of death.” As every doctor had hi ideas on its treatment, these ideas always came criticism from all friends, relations, and hang who became, for the time being, the self-app critics. Routine poulticing was the favourite re its chief virtue, to my mind, was that it gave the rel something to do and helped to keep them quiet own particular fad was what I was pleased to “masterly inactivity,” and the more seriously i patient the more fiercely did I resist any interfe Of course my results were no better nor worse anyone else's. I did learn that in general practice in the face of local tradition is never popular; b all get odd ideas at times by which we are prepai stand or fall.

I always found the case of pneumonia a wildly ex affair, for as the patient's condition grew more more desperate one became more and more c identified with the well-being and anxieties o family; for the patient was always someone's husband, or child. Though there was no specific re the presence of a doctor doing his best gave val moral support to both patient and family during the days waiting for the crisis.

My best-remembered case happened when I was much younger than I am now. A young man of 2 battling his way towards the 9th day of his illness. condition was pretty desperate and sleep his chief I got into my head the idea that his restlessness was d his becoming frightened, and that if only I could get off to sleep all would be well. And so, one afternoon, down on his bed, and told him to shut his eyes and sleep. I kept this up for about three-quarters of an Whether he became tired of my voice or sick of seeing I don't know, but he went to sleep; and when I retu some hours later he had had the crisis and was better. It of course, a colossal fluke and I recognised it as such. To I suppose it would be called psychotherapy.

TUBERCULOSIS

The early diagnosis of tubercle remains one of major problems of general practice. The standar what constitutes early diagnosis has considerably alte In the days before the general use of chest radiogra one had to depend upon the finding of abnormal phy signs in the chest or on the presence of the bacilli the sputum—a stage nowadays considered too late. theory, of course, early diagnosis is quite easy. chest is X-rayed and the problem is solved. But actual practice things can work out very differen The early signs are so slight, so varied, so indetermin that unless a doctor is tubercle-conscious an X may not be called for and precious time is wasted. all districts have access to mass-radiography un and it is quite impossible for doctors working in s areas to refer all cases that might be tubercle to t tuberculosis medical officer. One is therefore compell to resort to a sort of sifting process, and it is sm wonder that some cases slip through—no matter h fine the mesh. And how easy is it to rely upon negative film taken 6–12 months previously, only find that the patient has contracted the disease in interval.

As there is a general shortage of beds in the sanato and the patient usually has to wait some months befo admission, and as sanatorium treatment consists to great extent in rest in bed, I advise such patients to to bed until such time as they are admitted. This is, suppose, a simple precautionary measure, and it is qui easy to carry out until the patient says “Well, I've go to bed. How am I going to spend my time?” I a not prepared to admit that this is not my busine for many of these patients are youngsters who ha no idea of how to spend time and who need hel

m. it must be remembered, is a symptom, not a of bad morale. To face the diagnosis and treatment ibercle requires a deal of courage, and courage is xpendable commodity. The importance of this ple is implicit in the term " occupational therapy." nnot be applied too early.

due course the patient goes to the sanatorium and ie time returns, followed a few days later by a form from the tuberculosis office of the county il. It is a notice of his discharge, with a comment is condition and the suggested line of treatment. months of careful supervision, the results of serial y and of sputum examination, the response ie patient to whatever line of treatment has been ted—all these are summed up in one little cross ed with almost mathematical precision into one oblong. It is so simple that the least intelligent can see at a glance whether the patient has improved s not improved, whether the disease is arrested or [illegible] But from the point of view of the family r a more useless and unimaginative document be difficult to find—even amid all the rubbish has been thrown at us during recent years. I should ave supposed the turnover of patients in a sanam to be so large that the writing of adequate histories would be unduly burdensome to those in ol. Though the treatment of tubercle has been largely taken over by the specialist, the family r has still a part to play, and this part should be adequately recognised.

CORONARY DISEASE

e of my firmest impressions has been the astonishing ase in the incidence of coronary occlusion. Here d we have a problem which is essentially the of the family doctor. The unexpected onset, helming sometimes in its suddenness; the distress e patient; the threat to the family and all that it s—all combine to form a picture which can be htmare to all concerned. The treatment of the gency, the studied judgment throughout the weeks nvalescence, and the healthy adjustment of the at to his new circumstance demand a doctor's best. o easy to play too much for safety—to say " better live mouse than a dead lion," advice which can only be justified if the patient happens to have pirit of a mouse; so fatally easy to help a timorous at into the deceptive safety of a cardiac neurosis pay too little regard to the various economic s which have conditioned and must still condition atient's way of life. Only when each relevant circume has been weighed, and when the limits of cardiac nce have been defined, can a sound judgment be unced. And the only one who can pronounce it is mily doctor.

OBSTETRICS

ere is, I suppose, no branch of medicine which s a doctor more into contact with the family life s patients than obstetrics. I have been in many fortunate in that I have spent the greater part of rofessional life in a fairly small more or less static unity. Many of the children whom I delivered in arly years have now married and have children of own. I am awaiting the arrival of an infant which nable me to say that I have treated six generations amily.

ame into general practice when antenatal treatment conspicuous by its absence; when often the only e was a piece of paper thrust through the letterbox am expecting on Friday, will you please come"): the attending doctor was responsible for washing nother and bathing the baby. The local nursing iations had just been formed and midwives were only beginning to take over cases on their own. Patients sometimes found it hard to decide which was the better course to adopt. One of our local justices of the peace told with glee how he once received a note saying "Dear Sir, if you were expecting as I am expecting, would you have the nurse or the clarty doctor?" I could understand the difficulty of the writer, but I never had the courage to probe more deeply into the matter.

It did not take long for the midwives to establish themselves, and the local child-welfare clinics became more and more responsible for infant management and later for antenatal supervision. From the patient's point of view this arrangement had many good points: for wages remained low for many years, and doctors' fees, no matter how modest, were items which called for careful consideration. Always, however, there was the very great drawback that the doctor, although in name the family doctor, was not the person who had been responsible for the antenatal supervision, and was called by the midwife only in an emergency; so he tended to gain much more experience of the abnormal than the normal.

With the passage of years, the scope of routine antenatal care has widened, and in addition to blood-pressure readings, urine examinations, and pelvimetry, it now includes blood collection for grouping and for Wassermann tests. I am still wondering how I am going to tackle the case of a young and happy expectant mother who has got a positive Wassermann. For upon the wisdom and tact with which such a case is handled will depend the happiness of a young family. In any doctor's work, these two qualities, wisdom and tact, are so necessary and so hard to come by.

The control of pain during labour itself is becoming increasingly important, for we have at our disposal such important agents as 'Pethidine,' 'Trilene,' and nitrous oxide. On another plane we have the relaxation theory of Grantly Dick Read, with its emphasis on fear or anxiety producing overaction of the sympathetic and consequent muscle imbalance—a theory which seems to make obstetrics more of an art than a science. And so interested are the laity in obstetrical analgesia—and who can blame them?—that in the recent past we almost had "painless labour" thrust upon us by Act of Parliament. I find it in my heart to hope that he who was responsible for this most beneficent but ill-fated measure will be elevated to the peerage, and that he will emblazon on his coat of arms the likeness of a little child, and take as his motto the simple words "Does your mother know you're out?"

In the reduction of maternal mortality an important factor has been the introduction of the flying squad, staffed by our local consultants. This has saved the lives of many mothers, particularly by timely blood-transfusion, and many family doctors throughout our northern counties have great reason to be thankful for it. To lose a mother in a confinement is one of the greatest tragedies that can happen in general practice.

The introduction, in the early war years of special food-rationing schemes for expectant mothers has also played a not unimportant part in obstetric history. The higher standards of midwifery, the improved vigour of the newborn child, a wider knowledge of dietetics, and the advent of bacteriostatic drugs have combined to reduce the infantile death-rate, the vital statistic which reflects more than any other, the social progress of any community. But much remains to be done. A vast field for the specialised treatment of the premature infant awaits cultivation. Toxæmia of pregnancy is still with us and remains an enigma.

THE PSYCHOLOGICAL SIDE

No survey of general practice, however brief, would be complete without some reflections upon what might be called the flotsam and jetsam of medical life, the "neurotics" who haunt our consulting-rooms and test our endurance. All of them started this life heavily handicapped; but I sometimes wonder how much we, as a profession, have contributed to the end-result, either by faulty diagnosis in the early stages of an illness, by our failure to recognise the importance of emotional factors, or even perhaps by that extra cosseting which can undermine so insidiously, yet so thoroughly, the patient's confidence in himself. In this regard I welcome the more adventurous attitude of our surgeons who now encourage their patients to be up and about at a comparatively early stage in their postoperative convalescence. It may be that their reasons are the ever-present bed shortage, or a decreased liability to embolism or respiratory complications; but, speaking from the point of view of one who has to deal with such patients later on, I feel quite sure that very often early ambulation raises the patient's confidence and leads to his speedier return to work. One seldom sends a patient back to work too soon, but it is not uncommon to send him back too late.

I have not the necessary knowledge to concern myself with the various schools of psychological thought which have grown up around us. Suffice it to say that the idea of the dualism of mind and body belongs to the past, and that the phrase "the triumph of mind over matter" long ago achieved the notoriety of a cliché! We are now face to face with the idea of their essential oneness and of the physical basis of mind. It is possible that Dr. H. G. Miller's prediction that psychosomatic medicine, with "its implied dichotomy," will prove a mere phase "in the integration of psychiatry into the fabric of general medicine" has even now been justified, and that this hybrid has only turned out to be "a poor player who struts and frets his hour upon the stage and is heard no more." But whatever views one may hold on such things one cannot shut one's eyes to the fact that the so-called stress diseases are looming ever larger in our lives—the duodenal ulcer, the thyrotoxicosis, the non-renal hypertension with its vascular accidents.

Let me quote some words from Sir Heneage Ogilvie's address In Praise of Idleness [1] :

> "Body and mind seem to have been designed with a tremendous reserve of essential machinery, so that in their normal working labour and rest may alternate. In modern life they are forced to work abnormally.
>
> "These are the conditions under which a great proportion of the inhabitants of the older and more civilised communities live, and these are the conditions that are causing them to break down and are producing a group of diseases that we may call the stress diseases. In the less stoutly built it is the mind itself that gives way. In the more stable the mind remains coherent and calm and the mechanism working underneath it cracks under the strain."

Those of us working in general practice are only too familiar with the large proportion of patients coming to us complaining of a variety of symptoms which have apparently no physical basis and which must be emotionally mediated; womenfolk who after a few minutes' talk burst into tears, worried about—they know not what. The social havoc created by overcrowding, the difficulty of providing adequate meals, and the meagre family income in face of a rising cost of living are evident enough; while home life with its jealousies and frustrations, working conditions with the inevitable boredom of constant repetition, and the perpetual striving for security or self-advancement produce problems more deep-seated and therefore harder to solve. Many are insoluble. One can only do one's best and remember the old aphorism "Cure sometimes, relieve often, comfort always."

It has long been said that a good doctor is a psychologist. Whether this is true depends of cours what one means by the word "psychologist." W first this phrase was coined, it meant essentially the good doctor was a good judge of character—w is a good deal less than it implies today, for the sci of psychology, although still an infant, has gr immeasurably during the last twenty years. In student days, my only experience of such things w brief encounter with a few fairly characteristic exam of chronic delusional insanity, general paralysis of insane, and schizophrenia. The general medical w showed their usual quota of symptoms explained a as "functional." One was therefore brought up on purely mechanistic theory of disease causation, an took a long time before a mind so nurtured could rea that there was another side to the picture—that could not have a case of pneumonia, that there had be a patient suffering from pneumonia, and that ev patient required different treatment.

The passage of the years brought with it increa knowledge and experience and a fuller realisation of importance of the psyche in the ætiology and progn of disease. The acceptance of this idea was one thi but to put it into practice was another, because dire one embarked other difficulties arose. Two rules at le had to be observed. The first was that nothing sho be diagnosed as "functional" until rigid examinat had excluded all physical disease. (With the multiplic of tests at our disposal, this naturally invites the qu "What is the least number of X-ray photograp biochemical tests, and operative procedures that acceptable?" I have had occasion to wonder.) A the natural corollary was that any abnormality found was not necessarily the cause of the troub (In the end, of course, common sense and experien with a clear view of the over-all picture, are the fi arbiters.) The second rule was that, for any form psychotherapy to function properly, the patient had believe wholeheartedly in what he was told; and th one was always faced with his complete inability visualise anything other than some rather fancil disordered mechanics.

It is quite impossible for a practitioner to refer cases of mental ill health for further opinions—the are too few specialists and too few clinics; so the burd of treating the mild and early cases, and the responsibili of eliminating factors [illegible] condition [illegible] th falls inevitably upon [illegible] family doctor. Not only is he expected to give a compete opinion upon any branch of medicine or surgery wi which he may be faced; he is also expected, in a mode way, to be a psychotherapist. I am not surprised whe I hear that many of our younger graduates are slidin down towards the primrose paths of specialism.

THE FAMILY DOCTOR

As yet I have said little to justify my title. Possibl this delay is due to my reluctance to face my difficult and say what a family doctor is.

One may begin one's professional life as a gener practitioner, but one cannot begin as a family docto for this title implies a process endured, an experienc undergone. It implies, on the part of the doctor, th possession of certain qualities of mind—a persona integrity, a genuine liking for people as distinct fro things, a natural sympathy and kindliness. In thi respect, I think of some words of Sir Thomas Brown in his *Religio Medici* :

> "Let me be sick myself if sometimes the malady of my patient be not a disease unto me. I desire rather to cure his infirmities than my own necessities. Where I do him no good, methinks it is scarce honest gain, though I confes 'tis but the worthy salary of our well-intended endeavours."

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[1] *Brit. med. J.* 1949, i, 645.

to all this I would add a fair share of that most and valuable of all commodities—wisdom. You well argue that I am painting my picture in too colours. I can only say that I prefer to regard y doctor” as an ideal at which to aim—an ideal mere scholarship takes second place to character. the many discussions revolving round the al Health Service one heard a good deal of the -patient relationship, and of the disappearance of ily doctor and family practice as we now know it. not speculate here on these topics. Medical . consulting or general, is not static and has been subject to the stresses and strains of social evolutionary forces. It has altered very considerably the last few decades, for the increasing com- of exact diagnosis and treatment has led to the th of a new species of medical man—a species e unknown to our forefathers—the specialist. There o doubt that this new growth is essential, for the alist occupies a vital place in the tracking down he more vicious or skittish diseases. It has therefore e about that this art of medicine is, more and more, ing the intimacy of the bedside, seeking more ous quarters under the cold and calculating roofs he scientific laboratories. We live in a scientific age. It is unfortunate, though perhaps inevitable, that of omniscience with which the specialist has developed by the official mind has led in some e to the denigration of the general practitioner. he is the one with the view of the whole picture is finally responsible for adapting therapy to the and ultimate well-being of the patient.

he march of 20th-century science has thrown back, in widening arcs, the frontiers of ætiology, diagnosis, treatment, enabling us to understand, in our little how it is that some things happen. It tells us ing at all of the mystery of why they happen. he years have gone on, I have become increasingly ious of the “Destiny that shapes our ends” and of truth in the very cynical old French saying: “God s, the physician takes the fee.”

E INSULIN TEST FOR VAGAL SECTION

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E value of vagal section will stand or fall on two s: (1) the possibility of ensuring that all the s of the vagus nerve have been cut: and (2) the ence-rate of ulceration after a neurectomy proved complete. A sound standardised test for vagal ity is therefore necessary, and Hollander (1946,) claims that the insulin test meets this need. This however, has not been standardised, and its results therefore be equivocal. An attempt is made here ablish standards for the test.

EXPERIMENTAL EVIDENCE

and Sivó (1925) have shown in the dog that an ion of an adequate dose of insulin causes a flow cid gastric juice. This result must come about by a local direct stimulation by insulin of the ic glands or autonomic nerve-endings, or indirectly stimulation of the hypothalamus, and thus of the s, by hypoglycæmia. For this reason we must be that insulin only acts centrally through the vagus.

and Stewart (1932) reported that an injection ulin which did not lower the blood-sugar level below per 100 ml. stimulated an acid response in a gastric . However, this was an isolated finding, and, there no evidence that the experiment was carefully controlled. nal factors may have come into play. Boldyreff and

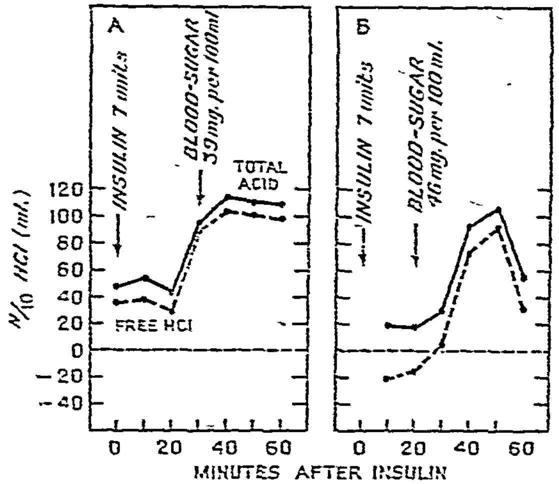


Fig. 1—Response to insulin 0·1 unit per kg. of body-weight: A, pre-operative response: B, definite positive response ten days after operation. Vertical scale represents ml. of N/10 HCl or NaCl equivalent to 100 ml. of gastric juice.

Stewart also stated that an injection of glucose given simultaneously with the insulin did not suppress the gastric secretion, but they gave no supporting data. Their evidence must therefore be discounted, since there is much good evidence that the simultaneous administration of glucose nullifies the gastric secretory effect of insulin, and that no secretion will take place unless an adequate hypoglycæmia has been produced (Okada et al. 1930, Roholm 1930).

It can therefore be assumed that the gastric secretion that follows the injection of insulin is the outcome of central stimulation of the vagus by hypoglycæmia and it is no part due to peripheral excitation of the vagal nerve-endings. The test would be more properly named the hypoglycæmia test.

BLOOD-SUGAR LEVEL

The next step is to determine what is an adequate degree of hypoglycæmia. Jemerin et al. (1943), experimenting on dogs, fashioned three different types of gastric pouches: in one the nerve supply of the pouch was preserved: in the second the vagi were partially severed: and in the third the nerve supply was completely destroyed. They found that, when the blood-sugar level was reduced to about 50 mg. per 100 ml., acid was secreted in the pouches with intact nerve supply, and in all except one out of the five partially denervated pouches, but not at all in those totally denervated. Thus, in this experiment, the test was entirely successful in demonstrating that the vagi were either completely intact or completely severed, but it was not entirely reliable in indicating partial severance. Jemerin et al. (1943) explained the failure in the one dog by suggesting that in making the partially denervated pouch all the nerve-fibres had either been inadvertently cut or had subsequently undergone degeneration. This is probably the correct explanation, but not certainly so. It is possible that the amount of acid secreted is roughly proportional to the fall in the blood-sugar, though Hollander et al. (1942) could not establish this point, and that, rather than an all-or-none effect, small areas of the stomach are controlled by each nerve-fibre, the amount secreted being a summation effect. If this is so, and if only a few vagal fibres remain, an acid response would be observed only after considerable hypoglycæmia, and at 50 mg. the blood-sugar may not be depressed sufficiently to bring about a detectable secretion. It must therefore be realised that the only certain information to be gained from the test arises from a positive or secretory response, which indicates definite vagal activity; with a negative response it cannot definitely be said that all the nerve-fibres have been cut, for the stimulation may have been insufficient to reveal activity from just a few residual fibres.

Hollander (1946, 1948) has stated that in applying the test to man it is sufficient to reduce the blood-sugar to 50 mg. per 100 ml. This is simply a direct application of the animal experiment. It may be that man's response to hypoglycæmia cannot be so closely correlated with that of the dog, and that it is necessary to reduce the blood-sugar further in man than in the dog to produce hypoglycæmic symptoms and the acid response. The early work by Roholm (1930) on this subject was done on man. He believed that the blood-sugar level should be depressed to 40–50 mg. per 100 ml. Using a dose of 12 units intravenously in 16 experiments on 9 normal persons he invariably obtained an acid secretion, and almost as invariably the blood-sugar level was lowered to below 40 mg. Can we be satisfied with a test in which the lowest level of blood-sugar reached lies between 45 and 50 mg. per 100 ml.? At the Queen Elizabeth Hospital it has been possible to study the 40–50 mg. range more closely: 182 tests were made on 177 patients before vagotomy. These tests were done under varying conditions of dosage to discover the ideal dose of insulin. The lowest blood-sugar level has varied between 32 and 96 mg. per 100 ml. In 18 cases the level fell to 46–50 mg.; in 11 of these a definite acid response was obtained; in 4 the response was uncertain; and in the remaining 3 no acid was secreted in spite of the fact that the specimens were free from bile. With a level of 46–50 mg. then, the acid response is uncertain. As opposed to this, in all of 28 cases in which the lowest blood-sugar level was 40–45 mg. a clear-cut acid secretion was obtained, even on occasion in the presence of bile. It can therefore be said that in man the blood-sugar must be brought to 45 mg. per 100 ml. or below before the test can be regarded as satisfactory. Further, these findings render sterile any argument that the acid response depends on the degree of fall from the fasting blood-sugar level, or on the rate of fall, rather than being a cons reflex at a given degree of hypoglycæmia.

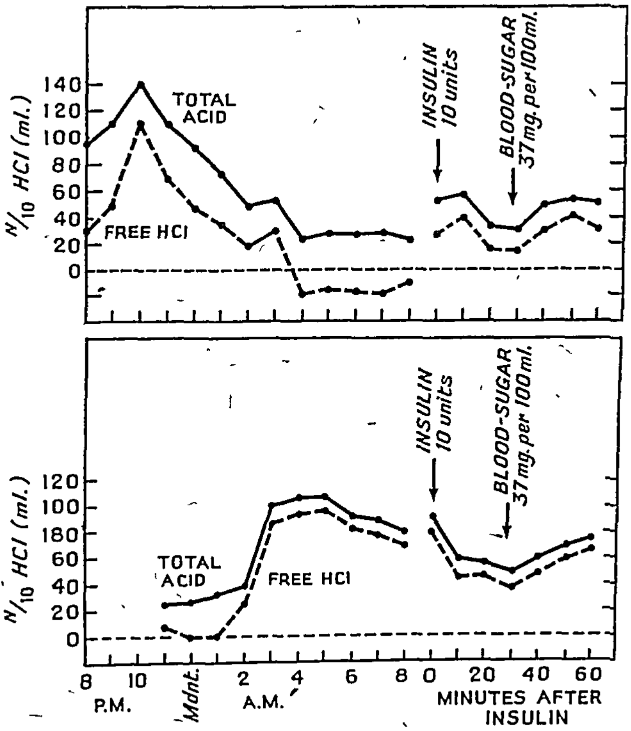


Fig. 2—Insulin tests in 2 cases six months after vagal section without gastro-enterostomy, showing acid secretion during night before test. Immediate postoperative tests in both cases had proved negative. Tests shown here reveal only a slight acid response.

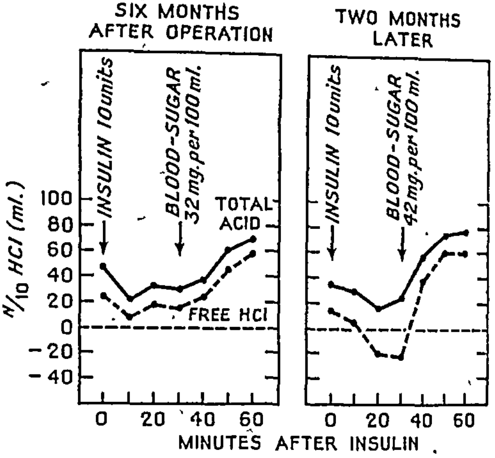


Fig. 3—Responses to insulin test, showing slow rise in acid six m after operation, and more typical rapid response in same cas months later.

METHOD

Occasion and Interpretation

For routine purposes it is only necessary to perf the test postoperatively. When the vagi are intact, quality and quantity of the acid response to hypoglycæ bear no more *relation* to the *ordinary acid* level in stomach than does the response to histamine. These "artificial" stimulants and far stronger than the nor psychical stimulus or that produced by food. A j operative test as a control for the postoperative obser tion would only be required if the response to hy glycæmia occurred at different blood-sugar levels different people. This may indeed be the case, but i certain that 45 mg. of blood-sugar per 100 ml. is low limit of the threshold if the vagi are complet intact. This level may therefore be taken as the mi mum to be attained in the postoperative test, and a preoperative test becomes superfluous.

If an acid response, closely resembling the preoperat type, is obtained during the early postoperative peri it probably indicates that a complete nerve-trunk l been overlooked (fig. 1). There are patients, howev who show no response to an adequate stimulus dur the first month after operation but secrete acid wh tested six months later. Out of 20 patients wi adequate and comparable tests carried out immediate and six months after operation, 8 responded in this wa though it is noteworthy that the acid response at s months is a modified one, in that it does not show t steep rise and the high final level characteristic of th preoperative pattern (fig. 2).

This raises the question of interpretation—can th be regarded as an acid response to hypoglycæmia an therefore as due to vagal stimulation? In answer this the following points are to be observed:

(1) In each case the increase in acid, such as it is, follo the moment when the blood-sugar reaches its minimum.

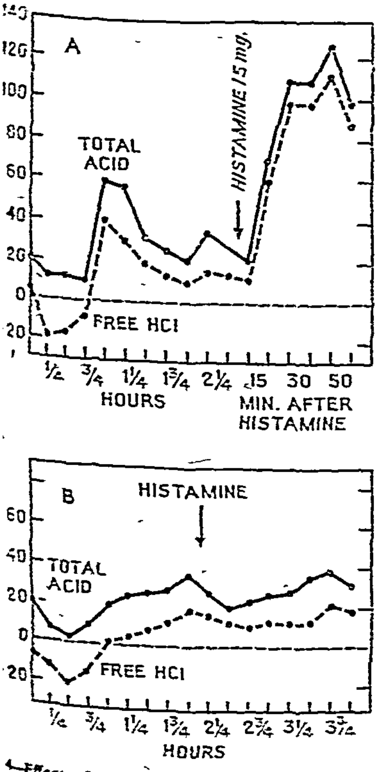
(2) Samples of resting gastric juice taken hourly throug out the night in these cases contain acid, whereas acid absent in those cases giving no acid response to the insul test (fig. 2). This nocturnal secretion of acid argues th existence of nerve-fibres, since it is difficult to conceive ho it can be produced hormonally during a twelve-hour perio of fasting.

(3) One patient who gave this modified response at th sixth postoperative month showed the typical full aci response when tested two months later (fig. 3).

As has already been remarked, there may be a summa tion of acid from separate nerve-endings in the stomach If a few fibres only are left intact rather than a whol nk, this type of modified response would be given. ther, in the recent postoperative period there is siderable gastric stasis, permitting the accumulation food and mucus which can buffer small amounts of id, thus concealing the response to insulin. In some our cases, even the response to histamine has been cured in the early postoperative period, as a result this stasis (fig. 4). Radiological studies on 69 patients months after operation have shown that gastric ne and peristalsis returned to normal in that time most cases, the only detectable abnormalities being her a slight delay in initial emptying or slow and shallow ristalsis in 14 cases, and some gastric residue after four urs in 18 cases. Sufficient recovery in gastric motility obviate the buffering effects of gross gastric stasis s therefore taken place after six months in most cases. It can therefore be seen that, though it is necessary do the test in the postoperative period only, it should done at least six months after operation to avoid reliable results.

e of Insulin

The test is done in the morning after a night's starva-n, unbroken by breakfast. The insulin is given ravenously, since in our early tests subcutaneous ministration was followed after a long interval by an certain fall in blood-sugar, making the test unmanage-le. In deciding the intravenous dose a balance has be made between avoiding gross symptoms of hypo-cæmia and depressing the blood-sugar level to 45 mg. r 100 ml. At first a dose of 0·1 unit per kg. of body-ight was tried; but, though in most cases this amount ought the blood-sugar level to about 50 mg. per 100 ml., ich was the figure we accepted at that time, it did not e a reasonably certain result. The dose was there-e fixed at 10 units, and this was made the standard all patients. This standardisation simplified the routine, and the quantity represented an *increased* dose for all but the heavy patients. It has been observed that in the immediate postoperative period the blood-sugar is reduced less easily than at any *other* time, but that, if a dose of 10 units of insulin is used for tests done either preoperatively or at six months or more after operation, the *blood-sugar will* be depressed to an adequate figure in 82% of all cases (see table). None of our patients has developed hypoglycæmic symptoms severe enough to warrant the administration of sugar.



4—Effect of gastric stasis: A, preoperative tamine response; B, lack of histamine response ing to gastric stasis and buffering effects of mach contents two weeks after vagal section thout gastro-enterostomy.

COMPARISON OF EFFECTS OF DOSAGE AND POSTOPERATIVE RESISTANCE TO INSULIN

Dose of insulin	Time of test	No. of tests with lowest blood-sugar level (mg. per 100 ml.)			Total
		Above 50 mg.	50–46 mg.	45 mg. or below	
0·1 unit per kg. of body-weight	A	15 (*31%*)	11 (*23%*)	22 (*46%*)	48
	B	10 (*56%*)	3 (*17%*)	5 (*27%*)	18
10 units	A	23 (*12%*)	13 (*6%*)	159 (*82%*)	195
	B	10 (*33%*)	3 (*10%*)	17 (*57%*)	30

A, preoperative tests and those done at six or eighteen months after operation.
B, tests done in the month after operation.

In each section the percentage of the total tests in that group is given.

This dose may therefore be regarded as almost achieving the desiderata, provided the immediate postoperative period is avoided.

In all tests the fasting blood-sugar has been estimated: further estimations have followed at ten-minute intervals up to and including the hour. In the 176 tests in which the blood-sugar level fell below 45 mg. per 100 ml. after 10 units of insulin, the time of optimal depression of the blood-sugar level was distributed thus:

Time of blood-sugar estimation after injection (min.)..	10	20	30	40	50	60
No. of tests with maximum depression at given time (out of 176 tests) ..	0	3	136	37	0	0

In the 3 tests showing the lowest blood-sugar level 20 minutes after the injection the blood-sugar level was at or below 45 mg. per 100 ml. at the 30-minute estimation, and this held good also for half the group with the lowest blood-sugar level at 40 minutes. From this it can be seen that a single blood-sugar estimation at 30 minutes after intravenous injection will provide the necessary information in 89% of all tests that reach the prescribed degree of hypoglycæmia; and two estimations—at 30 and at 40 minutes—will give 100% cover in this respect. Hollander (1948) observed that no reliance can be placed on symptoms—e.g., sweating—as indications of an adequate fall in blood-sugar. From the 334 tests done at the Queen Elizabeth Hospital it has been found that, though sweating usually begins when the blood-sugar level reaches 50–45 mg. per 100 ml., it has sometimes started at levels higher than 50 mg.: conversely, some people did not sweat when the blood-sugar level had fallen to 30–35 mg. per 100 ml. Blood-sugar estimations cannot, therefore, be eliminated.

SUMMARY

The only certain information to be obtained from the insulin test is that vagal fibres are intact when an acid secretion is obtained. The typical response shows a rapid secretion of acid.

The blood-sugar level must be reduced to 45 mg. per 100 ml. for an adequate test.

A lack of acid secretion in a postvagotomy case when the blood-sugar level is reduced to 45 mg. or less per 100 ml. cannot be regarded as certain evidence that all fibres of the nerve have been cut.

One test only is required for routine purposes, and this is best performed at least six months after operation, when difficulties arising out of gastric stasis and insulin resistance are obviated.

After 12 hours' fast the patient is given 10 units of insulin intravenously. A blood sample is taken 30 minutes after the injection to assess the blood-sugar level, and if possible another sample is obtained 40 minutes after injection.

An atypical acid response has been observed in some postoperative cases tested at six months, and its significance is discussed.

I wish to thank Dr. Garfield Thomas and his staff of the biochemical department, Queen Elizabeth Hospital, for the material they have provided in the insulin tests, and Prof. F. A. R. Stammers, C.B.E., for permission to publish this paper and for his guidance and advice.

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SULPHETRONE IN PULMONARY TUBERCULOSIS

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IN 1948, Brownlee described the structure, properties, pharmacology, and possible clinical uses of 'Sulphetrone,' and later Brownlee and Kennedy (1948) described its suppressive effect on progressive experimental tuberculosis in guineapigs. They found sulphetrone to be bacteriostatic but, in common with other sulphones, incapable of eliminating the tubercle bacillus from animal tissues. In the same year Anderson and Strachan (1948) assessed the clinical value of sulphetrone and concluded that patients with early infiltrative lesions were most likely to benefit from treatment and that in some such cases a favourable effect had been exerted. Clay and Clay (1948), however, concluded that, at best, sulphetrone could be regarded only as an adjuvant and not in any way as a specific against tuberculosis. Madigan (1948) was more optimistic and considered that improvement was greatest in chronic lesions, and that all exudative phases of infiltrating tuberculosis were halted and reversed by sulphetrone.

The following is an account of the results * in 25 patients treated with sulphetrone in 1943. The patients, 10 male and 15 female, were selected in so far as those with predominantly infiltrating lesions were treated, since it was felt that this type of case would be the most likely to respond to chemotherapy. In a few cases an attempt to induce an artificial pneumothorax had previously been unsuccessful, and in other cases collapse measures were delayed so that no patients on sulphetrone had any other ancillary methods of treatment, apart from rest in bed.

DOSAGE

The sulphetrone was given in the same way in all the cases. After 0·5 g. eight-hourly had been given cautiously for a few days, the amount was rapidly increased until a dose of 6–8 g. daily was reached, which was usually maintained until the end of treatment. A weekly check of red cells and hæmoglobin was made, together with a weekly estimation of the blood-sulphetrone. Fluid intake was restricted to 2 or 3 pints daily in view of the rapid excretion of sulphetrone by the kidneys. Ferrous sulphate gr. 3 three times daily was given to counteract the known tendency to hypochromic hæmolytic anæmia, which develops and continues throughout the administration of sulphetrone.

TOXIC EFFECTS

Minor symptoms, such as headache, nausea, and gastro-intestinal discomfort, were occasionally observed but were never severe enough to necessitate withd of sulphetrone. Most of the patients developed a le blue discoloration of the skin and mucosæ. The cause of this has not been determined, but it seem be of no consequence and rapidly disappeared the sulphetrone was stopped.

The most notable side-effect was the hæm anæmia, which was invariably present but adequately controlled with iron.

DISCUSSION

The immediate impression was that sulphetrone responsible for some improvement, as shown by low of the erythrocyte-sedimentation rate, gain in we and occasionally conversion of the sputum. The que of the effects of enforced rest, &c. was kept u consideration, and with that in mind we felt that immediate general improvement was a little better might have been expected without sulphetrone. In case particularly, though the sputum contained tub bacilli, the organisms were cultured with difficulty, inoculation into a guineapig did not produce tu culosis. In a few cases there was radiological clea which might possibly be attributed to the sulphetron

We began to hope that sulphetrone, if not bacteric was probably bacteriostatic and might render the b avirulent so that the patient could keep the di under control or progressing at a much slower rate.

When, however, the condition of the treated pati was considered after six years, our earlier hopes not been fulfilled. Of the 25 patients, 9 are dead, 14 of the remaining 16 required some form of coll therapy. The other 2 patients are well and have tubercle bacilli in their sputum; these patients initi had hard bilateral upper zone infiltration, and one them developed a spontaneous pneumothorax dur treatment, which resolved satisfactorily. The tubercul lesion extended in at least 7 cases: in 3 during treatm and in 4 cases within three years of completing treatme In 7 cases sputum conversion was obtained, but in 2 these this happened within a week of the start of tre ment and therefore can hardly be attributed to sulphetrone. One of these developed a spread in contralateral lung and subsequently required an artific pneumothorax. Of the remaining 5 cases, in 3 sputum became positive for tubercle bacilli within f months, six months, and eighteen months; in 2 of th an artificial pneumothorax was successfully induce the third patient is dead. There remain, therefore, patients whose tuberculosis has apparently becom quiescent without the help of any factor other th sulphetrone and their own natural resistance; both of these cases had that type of tuberculosis in whi the prognosis is reasonably good and a considerab degree of healing might be expected to occur naturall

On reflection, therefore, we are not convinced th sulphetrone was responsible for any remarkable improv ment; nor, in our opinion, did it clear any case tuberculosis to a sufficient extent to prepare the patie for collapse treatment. We are particularly concern over the fact that in at least 7 patients the tuberculo spread to the contralateral lung or to a fresh region the homolateral lung; this would not happen und treatment with an effective bacteriostatic drug.

CONCLUSION

In our opinion there is no evidence that sulphetro per se has a place in the treatment of pulmonar tuberculosis.

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* A table showing the clinical, radiological, and laboratory findings, dosage, &c., will be supplied on application to the Editor of THE LANCET.

ALLERGIC SPECIFICITY OF POLLENS

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WHEN we started desensitisation treatment for hay-ever thirty-eight years ago we decided, first by the onjunctival reactions and later by skin tests, that the rasses were such a homogeneous group that if a man as sensitive to the pollen of any one of them he would e, more or less, sensitive to all. Experience in treatment as since proved that if he is *thoroughly* desensitised ith a vaccine made from any one of these grass pollens e will have been desensitised to all: he has had "a ure" for his hay-fever—for that year at least. Though he accent may be a little more on the "thoroughly" ow than it was then, this still holds true.

But, as more and more hay-fever patients came to e tested and treated, it was found that ome seemed to have their supposed hay-ever symptoms peculiarly late in the year, then there could be very little grass pollen n the air to explain them. One of the auses of these autumn para-hayfevers (as ve now call them) was pollen from some ompositæ—e.g., asters. For the premature ollen fevers of early spring we found he pollens of the anemophylous trees to e largely responsible.

These para-hayfever cases are of small mportance clinically because they are so ew compared with the great mass of hay-ever cases which crowd our clinics every pring for the desensitisation treatment ith grass pollen. Often, though not always, s we shall see, the para-hayfevers need heir own special pollen extracts for desensitisation; he steady search for useful pollens for the treatment f these few cases has led to some interesting work n the extent of pollen specificity of the patients.

This work is done by a combination of skin tests of the various pollens concerned, and by fractional desensitisation in a multiple sensitivity.

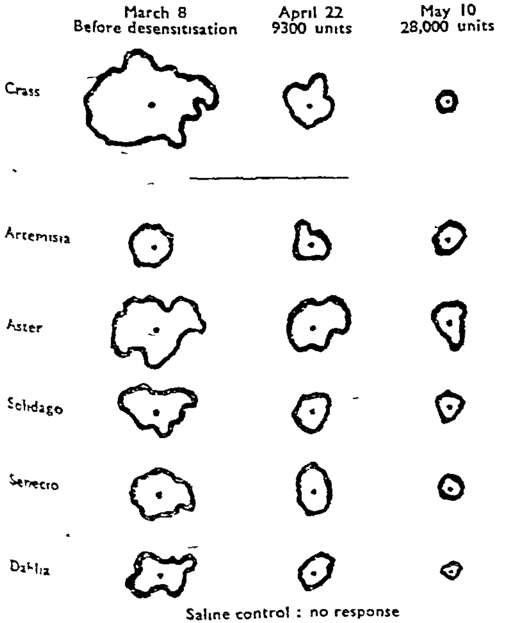

Fig. 1—An example of spread sensitisation: desensitisation with grass pollen desensitised also against other pollens.

Desensitisation is too long a story to be repeated here, and is too well known to the experts. The skin tests are by the ordinary prick technique: briefly, a drop of strong extract of the pollen in question is placed on the patient's skin; through this a prick is made with a clean needle down to the cutis vera. The drop of extract is then wiped away, and the œdema wealing is allowed to develop fully in 10–15 minutes. The outlines of these weals are recorded as shown in figs. 1 and 2; and, that these results may be given diagrammatically, the area of the weals was also calculated in square millimetres—as shown in the "sensitivity patterns" given below.

There is clearly a strong specificity separating the grass pollen from the pollens of compositæ or of anemophylous trees; 90% of our true hay-fever patients react on the skin only to grass pollen. Only 9 or 10% out of some thousands of hay-fever patients react also to one or more of the compositæ pollens which we have tried; perhaps a bare 1% of patients react to the tree pollens with which we have tried them.

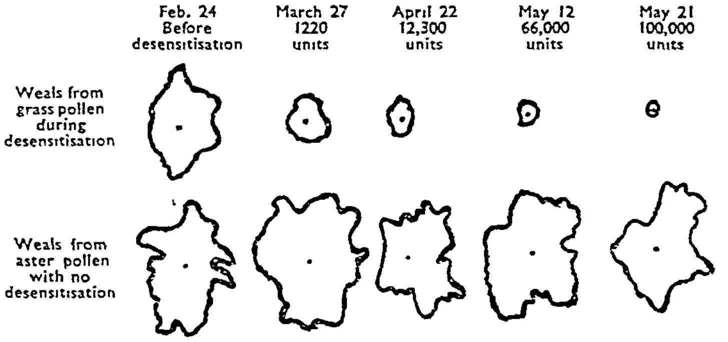

Fig. 2—An example of double sensitisation: desensitisation with grass pollen did not desensitise also against aster pollen.

The converse of this seems to be true about those few patients who come to us not for hay-fever but for para-hayfever due to pollen of trees or of compositæ. Where this is found to be authentic by skin tests, only a very few are sensitive to grass pollen also; but the numbers who come to us are too few for percentages to be cited. On treatment these para-hayfever patients give desensitisation results as good as those of the true hay-fever patients, but they need their own particular pollen extracts for successful treatment, and do not benefit from grass-pollen vaccine.

Interesting problems arise, however, with a dual or a multiple sensitivity. Most of the 10% of our hay-fever patients who are sensitive to other pollens as well as to the grass pollen have, it seems, not a double or treble sensitisation so much as a sensitivity to some protein or proteins common to all these pollens—there is a "spread" of sensitivity. Fig. 1 shows such a case: the patient needed only treatment with a hay-fever vaccine to lose her prick-test wealings with a more or less chance collection of composite pollens.

In the other group there is no such spread of sensitivity, but the patients possess two or more genuine and separate sensitivities. If such a patient is treated with grass pollen only, he often reports next year that the results were magnificent up to the middle or the end of July, but that the symptoms returned to him in the late summer and autumn. Fig. 2 shows why this should be so. Such a case needs for *complete* relief of symptoms not only grass-pollen vaccine for the hay-fever but also aster-pollen vaccine for the aster para-hayfever.

The five aster wealings in fig. 2 are about as uniform as this method of testing will allow; they would not have been more uniform if no treatment had been given. The wealings depend on other factors beside sensitisation—e.g., the patient's emotions at the time of testing—hence the slight variation.

The general diminution of the wealings to all *pollens* as shown in fig. 1 does not indicate a lessening of the patient's general sensitivity; the changes resulting from exclusive grass-pollen treatment seldom spread beyond the pollens. The spread of desensitisation follows the line of biological relationships, as has been shown by one of us, and is limited by such relationship (Freeman 1920, Freeman and Hughes 1938). Fig. 3 shows this limitation. This patient had long been sensitive to grass pollen (and some other pollens) and to white of egg; as she had successfully avoided all egg substances for fifty years, and as hay-fever was the only thing troubling her, she asked for treatment with grass pollen only. After seven years' successful treatment for hay-fever the grass-pollen weal had been permanently reduced to very small size, but the egg weal was as big as ever, or perhaps bigger. It was decided, however, to give one more year of grass-pollen treatment—but of grass-pollen treatment only. Fig. 3 shows what happened to the various wealings in consequence of this. All the pollen weals are smaller (as in fig. 1), and once again the hay-fever treatment has been a clinical success; but the egg weal is certainly not smaller.

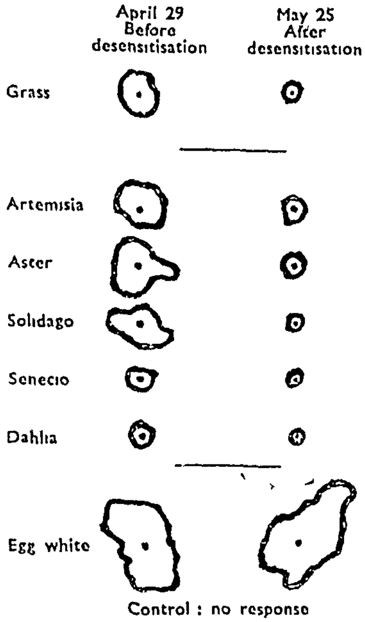

Fig. 3—An example of desensitisation limited by biological relationships: desensitisation with grass pollen desensitised also against other pollens but not against egg white.

If we examine the relative sensitivity of patients to a number of extracts of pollen of compositæ or of trees, we find the greatest diversity. Sometimes there is a strict specificity to the extract from one such pollen; other patients give a general and perhaps weak response to many or all of the pollens used for the test. Sometimes a patient is considerably affected by two or three pollens but not at all by the rest of them; there are all gr *in between, till one is driven to conclude* that there hardly be two patients alike. The arrangement of idioceptors in their blood must be very diverse. Exam of different "sensitivity patterns" of various pol sensitive patients are shown in fig. 4.

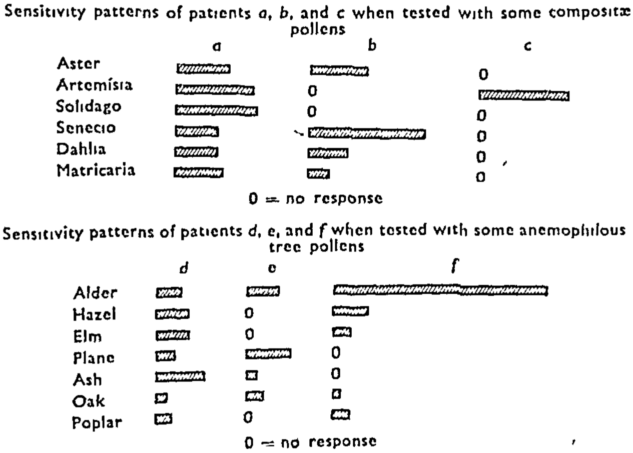

Fig. 4—Sensitivity patterns of various pollen-sensitive patients

CONCLUSION

The extract from any one pollen—e.g., of a gra must be a veritable hotchpotch of differing pro molecules. It is easy to conceive that some may found in that one particular grass's pollen only; so and it seems far more, are to be found in grass-po extracts in general, but not in pollens other than grass; some, no doubt, have a much wider distributi and this according to biological relationship. as has b said.

The next move presumably is to separate the differ protein molecules of an extract from one single gr pollen to see if different patients are sensitive equa to the same moiety.

This seems to be a matter for electrophoresis of tl extract, such as was attempted by Abramson and co-workers with ambrosia pollen in the U.S.A.

But for testing of patients one would have to further and make actual division of the fluid extr according to the molecular content. This does not se beyond the bounds of possibility even now, becau the amount of fluid necessary for a prick test is so ve minute.

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ASPIRIN IN THE TREATMENT OF VASCULAR DISEASES

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Aspirin is an anticoagulant and it relieves pain. has previously been suggested (Gibson 1948, 1949) tl those two qualities might be effectively utilised in t treatment of *coronary thrombosis*. I have now collect evidence supporting this view, and experience sugge that for the relief of anginal pain aspirin may be super to the vasodilator drugs usually prescribed for t purpose.

It is difficult to assess the curative effects of a dr in a disease with a high natural recovery-rate, especia when the lesion is deep-seated; it is easier when t lesion is visible. If we could be satisfied that salicylat are of value in *the treatment of superficial* thrombo we might infer that they would be equally valuable thrombosis elsewhere in the vascular system. On t point my experience has been limited, but the two ca reported here, selected from others of a similar kind, encouraging, and I think justify a more *extended trial*

Of the efficacy of aspirin in anginal pain *I can spe* with greater confidence. *During the past nine mont* aspirin has been widely used in this *area* for this purpo To test the results obtained a questionary was sent o in the form illustrated below, to 22 doctors, of who 20 replied. Of these, 5 had not used it. Of the who had used it, 8 considered it was of *undoubted va in* relieving and preventing anginal *pain*; the r thought it was of some value; *none thought it usele* It must be noted that no details were asked for abo the type of case or the method of prescription, and realise that, to be of statistical value, *such* data must carefully defined. I merely *claim that* a prima fac case has been established for a more extensive trial *aspirin in coronary* disease. In making this suggestio ave in mind that salicylates have maintained their ation in the treatment of rheumatic carditis for e than fifty years with little scientific justification. haps a common factor in the pathogenesis of these conditions is increased coagulability of the blood. this connexion it is interesting to note that Magary 9) seems to have shown that the organisation of ace deposits of fibrin contributes to the progressive elopment of mitral stenosis, and Glazebrook and gley (1949), comparing the effects of heparin and ylate in the treatment of acute rheumatism, d that the results obtained with heparin differed little from those obtained with salicylate, which firmed the good clinical results claimed by Wasser Zander (1946) with heparin and dicoumarol in matic fever.

THE QUESTIONARY

have used aspirin in..........cases of anginal pain and der that it is of no use,* of some use,* of undoubted value* lieving* and preventing* this pain.

Signed —— ——

* Please scratch out what does not apply.

THE REPLIES

ctor	No. of cases	Effect of aspirin on anginal pain				
		No use	Some use	Undoubted value	Relieving	Preventing
.B. ..	?	..	..	+	+	+
. ..	4	..	..	+	+	+
J. ..	6	..	..	+	+	+
.A. ..	6	..	..	+	+	+
. ..	4	..	..	+	+	+
I. ..	5	..	..	+	+	+
.M. ..	2	..	..	+	+	+
..	3	..	..	+	+	+
.C. ..	3	..	+	..	+	+
.W. B.	3	..	+	..	+	..
. ..	4	..	+	..	+	+
.D. S.	?	..	+	..	+	+
..	?	..	+	..	+	..
..	Several	..	+	..	+	+
.D. F.	5	..	+	..	+	+
tal ..	45 +	0	7	8	15	13

CASE-RECORDS

se 1 (Dr. M. Wigram: *Chronic Thrombophlebitis of Legs*). married woman, aged 47, had had goitre in adolescence; matic fever at the age of 20; "white leg" (left), for which ad spent 6 months in bed, in 1927; phlebitis in her right fter injection for varicose veins in 1938. In April, 1948, itis had recurred in both legs and persisted. In October apparently not related to exertion, had developed in eck, arm, and pectoral region on the left side. Her r said she had hardly been able to leave her room for months, because of the condition of her legs.

Dec. 8, 1948, the patient was seen at Torbay Hospital, she could not walk without pain in the legs. Both lue and œdematous. Right and left internal saphenous swollen and tender. No abnormal physical signs in , lungs, or abdomen. Pulse regular, rate 100 per ; blood-pressure 160/110 mm. Hg. No obvious goitre. rocardiogram showed simple tachycardia. Urine normal. er over left cervical plexus. All deep reflexes in upper lower limbs were brisk. No wasting or sensory loss in arm or hand. Radiography showed enlargement of erse processes of C7. The pain in the arm was conus and related to movement rather than to exertion.

eatment.—A mixture containing aspirin gr. 20 was given times daily. This made the patient deaf, so the dose reduced to gr. 10 t.d.s. She tolerated this and continued his dosage for four months, since when she has taken daily.

ogress.—Her doctor reported that after two weeks on n the patient could walk without pain. He reported on Oct. 15, 1949: "The legs have been wonderful since started aspirin, and the veins have to a large degree peared. The pain in the chest is better and does not go the arms. Her main complaint now is cramp on walking; ould not walk before."

Case 2 (Dr. W. S. Baxter: *Temporal Arteritis*).—A man, aged 67, had five months' history of vertical headache followed shortly by pains in the arms and legs, ascribed to rheumatism; and three months' history of painful swelling of the right temporal artery. He said he had lost 6 lb. in five months.

On May 25, 1949, he was seen at Torbay Hospital, when his weight was 8 st. in clothes. His temperature was 97·4°F. He was edentulous and wore dentures. Pulse regular, rate 76 per min., blood-pressure 120/80 mm. Hg. No abnormal physical signs in heart, lungs, or abdomen. Urine normal. Electrocardiogram normal. Erythrocyte-sedimentation rate (E.S.R.) 38 mm. in 1 hour. Fundi normal. The right temporal artery was red, swollen, and nodular.

Treatment and Progress.—Aspirin gr. 10 four times daily was ordered. After the patient had taken aspirin for two weeks the pain in the temporal artery stopped, but the vertical headache and limb pains persisted and the E.S.R. was now 55 mm. in 1 hour. The right temporal artery was no longer red or tender. On July 20 there was no pain or tenderness in the temporal artery, though it felt rather hard. The headache persisted. Hypochromic anæmia was present. Aspirin was stopped, and iron by mouth and liver injections were given. On Sept. 14 the temporal artery was normal, and the anæmia was improving.

Case 3 (Dr. M. Lees: *Persistent Anginal Pain on Exertion and at Rest*).—A man, aged 60, had had coronary thrombosis in the Army in 1942, for which he had been in hospital four months. Since then he had had asthenia, loss of weight, angina of effort, and frequent long (up to 2 hours) attacks of angina at rest. Trinitrin relieved the effort pain but not the long attacks at rest. In February and June, 1949, cerebral attacks had come on, associated with headache, giddiness, and hemianopia. During the past two months the effort pain had been more disabling and long attacks of severe retrosternal pain, radiating into both arms, had occurred daily.

On Sept. 27 the patient weighed 10 st. $^1/_2$ lb. in his clothes. Pulse regular, rate 50 per min.; blood-pressure 180/115 mm. Hg. Apex-beat forcible and felt beyond its usual site. Soft systolic murmur heard over aortic area. No signs of aneurysm or of pulmonary congestion. Nothing grossly abnormal in the fundi. Left quadrantic hemianopia. Knee-jerks and ankle-jerks brisk. Pupils equal and reacted to light. Urine normal. Electrocardiogram showed inversion of T1 and T4.

Treatment and Progress.—Aspirin gr. 10 t.d.s. had been started two weeks previously. Since then the patient had had no pain at rest and the effort pain had been much less easily induced. On Oct. 10 his doctor reported that his condition remained most satisfactory. The patient has had no more attacks of pain at rest, but he still gets pain if he walks too far or too fast.

Case 4 (Dr. W. S. Baxter: *Severe Angina of Effort with Acute Lung Congestion*).—A man, aged 73, had had his enlarged prostate treated by diathermy eleven years ago, since when he had had pyuria. Angina of effort began in March, 1948, and persisted with increasing intensity and frequency. In April, 1948, he began to have attacks of pain on exertion associated with acute dyspnœa and bloody expectoration; these were relieved by trinitrin. When seen at his home on April 22, 1948, the patient was ambulant and had no pain except on exertion. Pulse regular, rate 72 per min.; blood-pressure 160/90 mm. Hg. Apex-beat and heart sounds obscured by thick chest. No murmurs heard. No signs of congestion in lungs. Liver not palpable. No œdema. Electrocardiogram normal in four standard leads.

On admission to Torbay Hospital on June 5, 1948, the patient was having daily attacks on the least exertion, with retrosternal pain radiating to the arms, intense dyspnœa, cyanosis, and abundant frothy bloodstained sputum. The attacks were relieved by trinitrin. No moist sounds were heard in the lungs between the attacks. The cardiovascular signs were as before, and another electrocardiogram was normal. Pulse-rate 60–80 per min., temperature normal. Wassermann negative. Radiogram of chest showed no aneurysm or neoplasm. Urine purulent, output 50–60 oz. daily.

Treatment and Progress.—Nicotinic acid 200 mg. t.d.s. was ineffective. On June 29 nicotinic acid was stopped, and aspirin gr. 20 four times daily was started. There were no more attacks after the first dose. The patient gradually resumed normal activities. After six weeks in hospital he was discharged with no serious cardiac disability. He had no further anginal attacks during the rest of his life. No other treatment than that recorded was given except phenobarbitone at night, which he had taken since March. He developed retention of urine and was readmitted for this in October, 1948. Suprapubic cystotomy was done, which he tolerated well. It was found that he had a malignant prostate, and he died from this in April, 1949.

METHOD OF ADMINISTRATION

The dosage adopted is that used for rheumatic carditis. With such massive dosage the possibility of toxic effects must be borne in mind. Graham and Parker (1948), using sodium salicylate for rheumatic and non-rheumatic diseases, found that minor symptoms, such as tinnitus, deafness, nausea, and vomiting, were common but disappeared if the treatment was continued. This is in keeping with our experience.

It seems undesirable to flood with sodium the tissues of patients with potential congestive failure, and it does not seem right to give large doses of calcium for thrombosis, so aspirin is the preparation of choice. But this is a local irritant. Douthwaite and Lintott (1938) found by gastroscopy that aspirin caused local inflammation of the gastric mucosa. They thought the inflammation was usually confined to the lesser curvature, so their method of administration was designed to ensure good contact of the aspirin with this area. They gave gr. 15 of crushed aspirin, washed down with 1 oz. of water, immediately after aspiration of the stomach contents. To attain their purpose they aimed at maximal concentration, so to avoid their results we should aim at maximal dispersion. To this end I give the aspirin suspended with tragacanth immediately after a meal. I have rarely had complaints and so far have never had to abandon treatment because of discomfort. Because salicylates increase the excretion of vitamin C ascorbic acid is added to each dose. Two standard mixtures are used, full and half strength, as follows :

Aspirin gr. 10 or 20.
Ascorbic acid 50 mg.
Pulv. tragacanth q.s.
Aq. menth. pip. ad $^1/_2$ oz.

For coronary thrombosis I give the gr. 20 mixture four-hourly after meals and during the night after a cupful of warm milk. This is continued for ten days or until the E.S.R. and leucocyte-count are normal. The half-strength mixture is then substituted and given four times daily for as long as seems desirable. For anginal pain without evidence of thrombosis I usually prescribe the half-strength mixture, to be taken three or four times daily for as long as is required.

SUMMARY

The apparent effect of aspirin therapy on superficial thrombosis suggests that it is an effective anticoagulant.

It can also be relied on to relieve and prevent even severe anginal pain.

It is therefore suggested that aspirin should be used in the treatment of coronary thrombosis and angina pectoris in the same way that it is used for rheumatic carditis.

To avoid its gastric irritant effects the aspirin should be suspended in a mixture.

I wish to thank the doctors, too many to mention individually, who have coöperated in this work.

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CERVICODORSAL OSTEOMYELITIS W
EXTRADURAL ABSCESS

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EXTRADURAL abscess of the spine is rare, but of considerable general interest in relation to diagnos treatment. The onset is fairly acute, with fever, l cytosis, local tenderness, and pain radiating alon distribution of the nerve-roots. This is followe compression of the spinal cord and partial or com subarachnoid block, often associated with throm of spinal blood-vessels caused by staphylococcal exo

Clinically, the appearance is that of a rapidly dev ing paraplegia. But the diagnosis may be diff since the paralysis may overshadow everything and the underlying lesion suggested by the early sig infection passes unobserved. Wilensky (1934) em sised this, pointing out that "the phenomenon of inflammation may be lost in a maze of neurol evidence."

Because the dorsal extradural space is only pot at this level, cervical and upper dorsal extradural ab is the least common site, and few cases have been repo Of 14 cases of spinal osteomyelitis with extradural ab reported by Browder and Meyers (1937, 1941) 3 in the cervical region. Kaplan and Read (1947) rep *1 case with extradural infection* without parapl cured with penicillin alone. Cattan and Corcos (recorded a case with quadriplegia which recovered treatment with sulphonamides, Delbet vaccine, penic and immobilisation, without laminectomy.

Finch (1947) reported a case of cervical osteomy of C3 and C4 in a baby aged 11 days. The in had upper-limb paralysis but no paraplegia. Treat with sulphadimidine ('Sulphamezathine'), penicillin, aspiration of the pus was successful. The abscess poi to the skin surface because of the softness of the tis Pressure on the cord never developed. Paralysis thought to be due to the pressure of granulations peripheral nerves. In an adult, on the other h paraplegia may supervene, since the pus is confined the thick ligaments and fascial layers, making lami tomy and drainage necessary to relieve pressure the cord.

The following case illustrates some of the spe problems raised by this condition.

CASE-RECORD

A soldier, aged 20, previously fit, was admitted to Mildmay Mission Hospital on Nov. 1, 1948, with a f night's history of diarrhœa, sore throat, and a crop pimples over his back. Eight days before admission was lifting a weight when he felt a sudden pain ac "the top of his shoulders." During the following week felt "off colour." The pain in his shoulders came and w and he developed a painful cough. Five days after the "b strain" he noticed clumsiness and numbness when using ring and little fingers of his left hand. On the seventh when he tried to get out of bed his legs collapsed bene him, and he could not pass his water next day.

The following day he could neither use his legs nor urin The left arm felt numb, the right hand felt weak, and it h him to turn his head from side to side.

On examination the patient was coöperative and alert but paraplegia and urinary retention. There was still some po in both legs, and the chest and abdominal muscles were paralysed. The reflexes were all brisk. The plantar respon were equivocal, but bilateral ankle clonus was pres There was sensory loss up to the knees. The optic di looked normal. Turning of the head was painful, and th was tenderness over the spines of the cervical verteb Whi Temperature, pulse-rate, and respirations were normal.

count : 16,000 per c.mm. (polymorphs 72%, lymphocytes %, monocytes 1%, eosinophils 1%). Lumbar puncture aled clear fluid, the pressure of which did not rise when ssure was exerted over the jugular veins. The cerebrospinal id (C.S.F.) contained 1 cell per c.mm., protein 450 mg., and rides 700 mg. per 100 ml. ; globulin was present. The ssermann reaction and Kahn test were negative in the S.F. Radiologically, there appeared to be a small destructive ion of the right transverse processes of C6 and C7 tebræ.

Progress.—Next day there was complete paralysis of all the abdominal, and lower intercostal muscles. The arms were ak, but the face was unaffected. The ankle and knee ks were absent, plantar reflexes were feebly flexor, and m-jerks all diminished. There was loss of all forms of sation up to L1–2. Local signs in the neck were unchanged. at night the patient's temperature rose to 103°F. A blood-nt showed red cells 4,200,000 per c.mm., Hb 84%, white ls 18,200 per c.mm. (polymorphs 74%, lymphocytes 21%, nocytes 3%, eosinophils 2%). Lumbar puncture revealed spinal block : the C.S.F. was yellow and opalescent, and tained 10 white cells and 150 red cells per c.mm. ; protein 0 mg. per 100 ml. ; globulin was present. On culture the S.F. was sterile. A course of penicillin, 50,000 units ramuscularly, four-hourly, was started.

On Nov. 3 ascending paralysis had involved all the inter-stal muscles and all the arm muscles except the biceps and pinator longus muscles on both sides. Dullness and fine râles re noted at both lung bases. The patient was rational t very sleepy. Blood-culture was sterile after three days' ubation. Dr. N. G. Hulbert saw the patient and diagnosed rvical extradural abscess ; he advised laminectomy.

Operation (Mr. J. T. Fathi).—On Nov. 4, under thiopentone, s, oxygen, and trichlorethylene anæsthesia an incision r cervical laminectomy was made from vertebral spines to D3. As soon as the spines were exposed, pus pointed the level of D2. When the paraspinous muscles were racted a large abscess, extending from vertebral level to D2 was opened ; this distended the extradural space, nting through the intervertebral ligaments from C7 to D1. minectomy of D1 and D2 was done. The abscess cavity opened in all directions, and several ounces of creamy was evacuated from the extradural space. Pressure on cord was relieved, and extradural fat was seen pulsating. cavity was dusted liberally with penicillin and sulpha-zole powder and closed in layers, with serum-proof silk, and all drainage tube was inserted. Two pints of blood was en by slow intravenous drip. Culture of the pus grew gulase-positive *Staph. aureus.*

Postoperatively the patient never regained consciousness, ugh he moved his arms and legs and the intercostal scles were again working. Lumbar puncture showed that spinal block had been relieved. The C.S.F. on Nov. 5 under a pressure of 260 mm. of C.S.F. and contained white cells per c.mm., protein 90 mg. and chlorides 700 mg. r 100 ml. ; globulin was present.

The patient's general condition rapidly deteriorated, the nical picture resembling an overwhelming pyæmia and ticæmia, with temperature rising to 106°F and ecchymoses earing in the skin.

In view of this the dosage of penicillin was raised to 250,000 ts four-hourly, and four-hourly intravenous injections of adiazine 1 g. were started, but the patient died on . 5.

COMMENTS

The onset of symptoms in this case was insidious, tending over a whole week. Paraplegia, spinal block, al tenderness, and signs of infection were the out-anding features. The differential diagnosis therefore luded poliomyelitis, ascending myelitis, tuberculous ries of the spine, and a space-occupying lesion in e cord.

The staphylococcus isolated was sensitive to penicillin n vitro, but neither the abscess nor the circulating pus as sterilised in vivo. Blood-culture was sterile before e operation, but it is possible that the lesion was etastatic from the crop of skin boils a week previously.

Because of the well-developed tissues in an adult man eration was a necessity, since the pus could not point the skin surface as it would in an infant (Finch 1947). The operation relieved the spinal block, but the massive dissemination of organisms in the blood-stream that it caused could not be controlled by chemotherapy, and so death resulted from pyæmia and toxæmia.

I wish to thank Mr. J. T. Fathi and Dr. N. G. Hulbert for their help and encouragement, and Dr. A. J. Watson, medical superintendent of the Mildmay Mission Hospital, for permission to publish this case.

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SPONDYLITIS ANKYLOPOIETICA WITH SEVERE ANÆMIA PRESENTING AS ACUTE ABDOMINAL DISEASE

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THE following case of spondylitis ankylopoietica was unusual in its mode of presentation and also in the association with a severe hypochromic anæmia.

A man, aged 34, whose job as a lathe-maker involved much stooping and weight-lifting, was first seen in the outpatient department of the West London Hospital in August, 1948, with a fortnight's history of sharp attacks of abdominal pain ; this pain had been of gradual onset, affected chiefly the right hypogastrium and loin, and doubled him up.

On examination the patient was extremely thin, depressed, and very pale, with generalised abdominal guarding and great tenderness in the right renal angle. Though apyrexial, he was admitted to a surgical ward with the provisional diagnosis of a right perinephric abscess associated with severe anæmia. It was in the X-ray film taken before intravenous pyelography that bilateral destruction of the sacro-iliac joints was noticed, whereas pyelography, examination of the urine, and a barium meal all showed no abnormality. Though the spine appeared radiologically normal, the correct diagnosis of spondylitis ankylopoietica was confirmed clinically by finding painful limitation of all spinal movements and a chest expansion of only $^3/_4$ inch.

Further questioning of the patient revealed that nine years previously he had been treated for right sciatica (aching pain from buttock to popliteal fossa causing his leg to give way). Intermittently this had troubled him since, especially in the cold weather and on walking. For the past fifteen months he had been treated for "nervous debility"—i.e., anorexia, lassitude, weakness, depression, right epigastric pain two hours after food, and a loss of two stone in weight. He had been unable to take more than one balanced meal daily. At work, which he had only been able to manage spasmodically in spite of a light job, his pallor had been commented on.

Treatment and Progress.—The spondylitis was treated by rest in a plaster bed for eight weeks, breathing exercises, and a course of deep X-ray therapy, localised in turn to each part of the spine. The man's symptoms improved steadily till spinal movements no longer caused severe pain. His chest expansion increased to $1^1/_4$ inches, but a dorsal kyphosis and rigidity of the lumbar spine persisted.

The patient had a severe microcytic hypochromic anæmia on admission—Hb 36%, red cells 3,300,000 per c.mm., colour-index 0·5—and an erythrocyte-sedimentation rate (E.S.R.) of 37 mm. in the 1st hour (Westergren). Transfusion of 2 pints of blood raised the Hb to 56% and red cells to 4,460,000 per c.mm. Thereafter the patient responded remarkably well to ferrous sulphate gr. 3 t.d.s., his Hb increasing to 78%, and red cells to 4,560,000 per c.mm., in the first week, and later more gradually during his course of deep X-ray therapy, to 96% and 4,920,000 per c.mm. by the end of the sixth week. His E.S.R. rose to 50 mm. in the 1st hour at the end of the first month, but had fallen to 9 mm. in the 1st hour by the end of the second month, and his depression vanished.

more attacks after the first dose. The patient gradually resumed normal activities. After six weeks in hospital he was discharged with no serious cardiac disability. He had no further anginal attacks during the rest of his life. No other treatment than that recorded was given except phenobarbitone at night, which he had taken since March. He developed retention of urine and was readmitted for this in October, 1948. Suprapubic cystotomy was done, which he tolerated well. It was found that he had a malignant prostate, and he died from this in April, 1949.

METHOD OF ADMINISTRATION

The dosage adopted is that used for rheumatic carditis. With such massive dosage the possibility of toxic effects must be borne in mind. Graham and Parker (1948), using sodium salicylate for rheumatic and non-rheumatic diseases, found that minor symptoms, such as tinnitus, deafness, nausea, and vomiting, were common but disappeared if the treatment was continued. This is in keeping with our experience.

It seems undesirable to flood with sodium the tissues of patients with potential congestive failure, and it does not seem right to give large doses of calcium for thrombosis, so aspirin is the preparation of choice. But this is a local irritant. Douthwaite and Lintott (1938) found by gastroscopy that aspirin caused local inflammation of the gastric mucosa. They thought the inflammation was usually confined to the lesser curvature, so their method of administration was designed to ensure good contact of the aspirin with this area. They gave gr. 15 of crushed aspirin, washed down with 1 oz. of water, immediately after aspiration of the stomach contents. To attain their purpose they aimed at maximal concentration, so to avoid their results we should aim at maximal dispersion. To this end I give the aspirin suspended with tragacanth immediately after a meal. I have rarely had complaints and so far have never had to abandon treatment because of discomfort. Because salicylates increase the excretion of vitamin C ascorbic acid is added to each dose. Two standard mixtures are used, full and half strength, as follows :

Aspirin gr. 10 or 20.
Ascorbic acid 50 mg.
Pulv. tragacanth q.s.
Aq. menth. pip. ad $^1/_2$ oz.

For coronary thrombosis I give the gr. 20 mixture four-hourly after meals and during the night after a cupful of warm milk. This is continued for ten days or until the E.S.R. and leucocyte-count are normal. The half-strength mixture is then substituted and given four times daily for as long as seems desirable. For anginal pain without evidence of thrombosis I usually prescribe the half-strength mixture, to be taken three or four times daily for as long as is required.

SUMMARY

The apparent effect of aspirin therapy on superficial thrombosis suggests that it is an effective anticoagulant.

It can also be relied on to relieve and prevent even severe anginal pain.

It is therefore suggested that aspirin should be used in the treatment of coronary thrombosis and angina pectoris in the same way that it is used for rheumatic carditis.

To avoid its gastric irritant effects the aspirin should be suspended in a mixture.

I wish to thank the doctors, too many to mention individually, who have coöperated in this work.

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CERVICODORSAL OSTEOMYELITIS V EXTRADURAL ABSCESS

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EXTRADURAL abscess of the spine is rare, bu of considerable general interest in relation to diagno treatment. The onset is fairly acute, with fever, cytosis, local tenderness, and pain radiating alo distribution of the nerve-roots. This is follow compression of the spinal cord and partial or co subarachnoid block, often associated with thro of spinal blood-vessels caused by staphylococcal exo

Clinically, the appearance is that of a rapidly de ing paraplegia. But the diagnosis may be di since the paralysis may overshadow everythin and the underlying lesion suggested by the early si infection passes unobserved. Wilensky (1934) e sised this, pointing out that " the phenomenon o inflammation may be lost in a maze of neurol evidence."

Because the dorsal extradural space is only pot at this level, cervical and upper dorsal extradural a is the least common site, and few cases have been rep Of 14 cases of spinal osteomyelitis with extradural a reported by Browder and Meyers (1937, 1941) 3 in the cervical region. Kaplan and Read (1947) rep 1 case with extradural infection without parap cured with penicillin alone. Cattan and Corcos (recorded a case with quadriplegia which recovered treatment with sulphonamides, Delbet vaccine, peni and immobilisation, without laminectomy.

Finch (1947) reported a case of cervical osteom of C3 and C4 in a baby aged 11 days. The i had upper-limb paralysis but no paraplegia. Treat with sulphadimidine (' Sulphamezathine '), penicillin aspiration of the pus was successful. The abscess po to the skin surface because of the softness of the ti Pressure on the cord never developed. Paralysis thought to be due to the pressure of granulation peripheral nerves. In an adult, on the other h paraplegia may supervene, since the pus is confine the thick ligaments and fascial layers, making lam tomy and drainage necessary to relieve pressur the cord.

The following case illustrates some of the sp problems raised by this condition.

CASE-RECORD

A soldier, aged 20, previously fit, was admitted to Mildmay Mission Hospital on Nov. 1, 1948, with a night's history of diarrhœa, sore throat, and a cro pimples over his back. Eight days before admissio was lifting a weight when he felt a sudden pain a " the top of his shoulders." During the following wee felt " off colour." The pain in his shoulders came and and he developed a painful cough. Five days after the " strain " he noticed clumsiness and numbness when using ring and little fingers of his left hand. On the seventh when he tried to get out of bed his legs collapsed ben him, and he could not pass his water next day.

The following day he could neither use his legs nor uri The left arm felt numb, the right hand felt weak, and it him to turn his head from side to side.

On examination the patient was coöperative and alert but paraplegia and urinary retention. There was still some p in both legs, and the chest and abdominal muscles were paralysed. The reflexes were all brisk. The plantar respo were equivocal, but bilateral ankle clonus was pre There was sensory loss up to the knees. The optic looked normal. Turning of the head was painful, and t was tenderness over the spines of the cervical verte Temperature, pulse-rate, and respirations were normal. W

SUMMARY OF REPORTED CASES OF INFANTILE CORTICAL HYPEROSTOSES

uthor	Age at onset (mos.)	Presenting symptoms	Bones affected	Soft-tissue swelling	Fever	Leucocytosis	Anemia	Other features	Duration
ley and rerman 1945)	1¾	Fever, irritability, tenderness lt. leg	Mandible, clavicles, ribs, rt. humerus, femora, tibiæ	Both legs	+	+	—*	Pleural exudate, spleen palpable	Inactive at 4 mos., normal at 6 yr.
	2	Swelling face, fever	Mandible, ribs, humeri, radii, ulnæ, femora, tibia	Face, forearms	+	—	+	Pleural exudate	Radiological changes after 10 mos., normal at 5 yr.
	2½	Swelling face, irritability	Mandible, clavicles, lt. scapula, ribs, lt. humerus, femora, tibiæ	Face, scapular region	—	+	—	Pleural thickening, seborrhoic dermatitis	Practically normal in 10 mos.
	½	Swelling scapular region, restricted shoulder movement	Mandible, clavicle, rt. scapula, humeri, femora	Face, scapular region	—	—	—	Elevation rt. diaphragm, dysphagia	Radiological changes remain at 4 yr.
affey 1946)	4	Swelling cheeks, irritability	Mandible, clavicles, rt. radius, ulnæ	Face, neck	—	+	+	..	Asymptomatic after 3 weeks
	18	Swelling lt. leg and foot, irritability, anorexia	Clavicles, ribs, rt. ulna, rt. femur, lt. tibia, rt. fibula, metatarsals	Lt. leg and foot	—	—	—*	Night sweating	Asymptomatic after 9 mos., but radiological changes remain
	1¾	Swelling cheek	Mandible	Face	—	+	—	..	Asymptomatic after 9 mos., but radiological changes remain
	4	Swelling face, fever	Radius, femora, tibiæ, fibulæ (other bones not radiographed	Face, rt. leg	—	..	..	..	Still febrile after 4 mos.; no further follow-up
	20	Fever, aching joints, refusal to walk	Lt. clavicle, lt. radius, ulnæ, rt. femur, tibiæ, metatarsals	..	—	+	—	Tenderness long bones	Asymptomatic after 2 weeks
	3	Swelling face	Parietal bones, mandible, rt. clavicle,	Face, scalp, sternoclavicular region	+	+	+	..	Still symptoms after 8 weeks
	3½	Irritability, tenderness face	Mandible, ribs	Face	+	+	—*	..	..
	3	Fever, irritability, swelling face	Mandible, clavicles, ulnæ, femora, tibiæ	Face, forearms, legs	+	—	+*	Shadow superior mediastinum	Normal after 2 yr.
	1½	Irritability, swelling, face, gastro-enteritis	Mandibles, clavicles, lt. humerus, radii, ulnæ, femora	Face, arms, lt. leg	—	+	..*	..	Slight residual changes after 6 mos.
th et al. (1946)	2	Upper respiratory infection with fever and irritability	Mandible, ribs	Face, lt. scapular region	+	—	+*	..	..
	3	Swelling face and pain	Nil	Face	+	—	+	"Suggestion of pleurisy" in radiograph	..
	21	Intermittent swelling arms, feet, scalp	Clavicles, ribs, ulna, rt. femur	Scalp, neck, lt. forearm, legs, feet	..	+	+	..	Much improved after 9 mos.
	30	Intermittent fever, irritability	Nasal bones, radius, ulna	..	..	—	—	Malnourished	..
(1939)	4	Fretfulness, swelling lt. forearm, poor weight-gain	Lt. radius, ulnæ	Lt. forearm	—	—	—	"Suggestion of vitamin-C deficiency from urine tests	Subsiding after 2 mos.
on et al. (1947)	2	Swelling scapular area	Mandible, rt. clavicle, rt. scapula	Scapular region	..	+	+	..	Cleared in 7 mos.
hipple (1947)	3	Irritability, tender swelling face	Skull, mandible, clavicles, ribs	Face, occiput	+	+	+	..	..
(1947)	4	Swelling cheek and forearm	Mandible, rt. ulna	Face, neck clavicular region	+	+	+	..	Almost cleared in 6 mos.
(1948)	3½	Swelling face	Mandible, lt. clavicle, ribs, lt. ulna	Face, lt. arm	+	—	+*	Primary tuberculous lesion in chest, spleen palpable	Cleared in 6 mos.
uman (1948)	4	Swelling face, fever	Mandible, clavicles, ribs	Face, rt. forearm, clavicular region	+	+	—	..	Almost cleared in 6 mos.
son and k (1948)	2	Swelling and tenderness rt. forearm	Mandible, clavicles, scapula, ribs, rt. radius, rt. ulna	Face, rt. forearm, clavicular region	+	+	..	..	Still present after 6 mos.
n Zeben (1948)	1½	Swelling lt. leg	Clavicles, rt. humerus, lt. tibia	Lt. leg	—	..	..	Parents have had syphilis	Disorder disappeared after 13 mos.
	2	Swollen, painful legs	Mandible, humeri, radii, tibiæ	Mandible, legs	..	—	+*	Brother of previous case	Died with mastoiditis 3 weeks after admission
	3	Swollen, painful legs	Humerus, radius, ulna, femur, tibiæ	Legs	—	+	—	Cousin of 2 previous cases	Improving radiologically 18 mos. later
Reilly (1949)	2	Swelling face, fever, diarrhœa	Mandible, ribs, long bones, pelvis	Face, limbs	+	+	+	Generalised lymphadenitis	Residual broadening some bones at 15 mos.

* Erythrocyte-sedimentation rate raised.

DISCUSSION

The sudden onset of severe abdominal pain with no history of backache or stiffness and the severe anæmia were responsible for the initial failure to recognise this case of spondylitis ankylopoietica. On full consideration it was typical, not only in the patient's age and sex but also in the root pains, anorexia, and debility. The pains were never "girdle pains"; in the earlier stages they might have been interpreted as due to peptic ulceration, and later they were wrongly interpreted as due to a renal lesion.

A mild microcytic hypochromic anæmia is common in spondylitis ankylopoietica,[1] but a Hb as low as 36% is rare. There was no history or evidence of chronic blood-loss, and since the patient took both meat and green vegetables at his main daily meal, his iron intake should at least have reached the daily minimum of 5 mg. for a male. Unlike the failure of iron therapy in the anæmias associated with trauma or sepsis,[2] iron in this case was utilised as soon as it was given in large quantities, and before the patient had had any other treatment, beyond rest in bed and routine vitamin therapy. The defect seems to have lain either in a failure to assimilate iron or in an abnormal need for iron.

We wish to thank Dr. W. S. C. Copeman for his encouragement and permission to publish this case.

INFANTILE CORTICAL HYPEROSTOSES

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THERE are now 28 cases of infantile cortical hyperostoses on record, but the following example is only the second reported in England.

On Aug. 13, 1948, a 6-weeks-old male first-born infant was brought to an outpatient clinic in Nuneaton because he had recently developed a swelling above the left knee. This appeared not to be tender, and there was no history of trauma or of constitutional upset. Birth had been normal and the baby was being breast-fed. Cod-liver oil and orange juice had been given from the 4th week of life, when he had had bronchitis. He had gained weight well and was otherwise symptom-free.

Examination.—A diffuse but rather firm swelling was palpable deep in the tissues of the left thigh, which was slightly increased in girth. There was no reddening of the overlying skin, and manipulation of the lump appeared to cause no pain. X-ray examination on Aug. 16 showed a layer of periosteal thickening on the anterior and outer aspects of the left femoral shaft. No explanation for this was evident. In both mother and child the blood Wassermann and Kahn reactions were negative.

Progress.—At the end of August the swelling, though smaller, was still present. A radiological scrutiny of the entire skeleton was performed on Sept. 13. This time the changes in the left femur were more obvious (see figure); similar changes were found in the right femur, but all the other bones were normal. By November the soft-tissue swelling had vanished, but further radiographs on Nov. 11 showed that periosteal changes were more widespread and involved both femora in the whole length of their shafts, as well as the left humerus (see figure) and the proximal half of the left ulna. Mandible, clavicles, ribs, and scapulæ were unaffected. On Feb. 7, 1949, persisting periosteal changes were noted in both femora and the left humerus. On March 21 the white-cell count was 18,000 per c.mm. (polymorphs 25%, lymphocytes 70%, monocytes 4%, eosinophils 1%). By March 23 X-ray changes were becoming generally indefinite, and subperiosteal bone was merging with the cortical bone. Throughout this period the baby seemed to be in perfect health, and no further swellings became apparent.

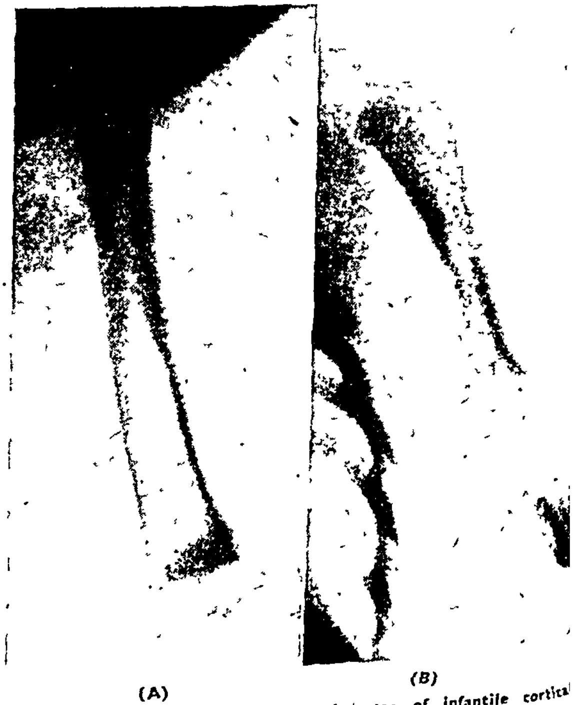
DISCUSSION

Attention was first drawn to the syndrome know the U.S.A. as infantile cortical hyperostoses by Ca and Silverman (1945) who described several ca The numerous subsequent reports of the condit nearly all of which have come from the U.S.A., summarised in the accompanying table; a case descri by Ellis (1939), which had certain resemblances to remainder, has been included.

From these accounts the following picture of the ill emerges. A young infant in good health abruptly devel a swelling of some part of the body—usually a l the face, or the neck. At this stage, there is o irritability and sometimes anorexia, but constituti disturbance is often slight and sometimes absent, the infant usually gains weight normally. The swel is palpable deep in the soft tissues; it is rather f but poorly outlined, and may be tender; but it is hot and the adjacent skin is not red. X-ray examina shows the formation of periosteal new bone envelopi part or the whole of the bone most nearly related the swelling, and involving also some other bones. bones most commonly affected are the mandib clavicles, ribs, scapulæ, and long bones of the lin and bones are often involved successively. Commo there is some fever, leucocytosis with a normal differen count, and hypochromic anæmia.

The disease is active for from 8 weeks to 9 mont but some X-ray changes may remain after this. disorder is benign, however, and all changes eventua disappear without after-effects. Biopsy of affected b shows simple hyperplasia of the cortex beneath an activ proliferating periosteum; on culture the area pro sterile. Bacterial infections, scurvy and rickets, traum and malignant disease have been satisfactorily exclud as the cause, which is still unexplained.

When swelling and tenderness of a limb are accompani by localised skeletal appearances such as have be described, the lesion may be mistaken for a trauma or infective one involving only one bone, unless oth bones are examined; and cases have probably be



(A) left femur, (B) left humerus in case of infantile cortical hyperostoses.

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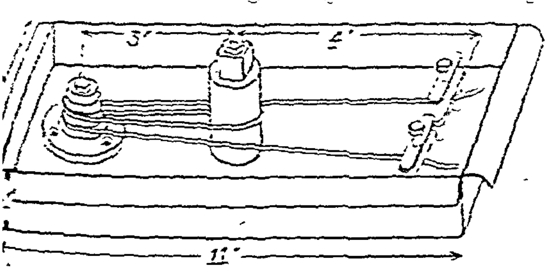
New Inventions

TERILISATION OF POLYTHENE TUBING FOR ANÆSTHETIC PURPOSES

introduction of continuous spinal epidural and analgesic methods requiring a plastic catheter raised certain difficulties. The apparatus for these ods was originally designed in the United States consisted essentially of a non-malleable steel needle—Tuohy needle—through which a length of plastic ng could be inserted, the needle then being with- rn. The tubing recommended is 'Vinylite,' but, so s I am aware, no similar tubing of the requisite size to withstand autoclaving is obtainable in this ntry.

t the Radcliffe Infirmary, Oxford, we have substi- d 'Polythene' tubing for vinylite. Polythene ng will withstand boiling though not autoclaving, but when it is boiled and then immersed in cold water it swells; the outer diameter increases at the expense of the length, and the tubing will no longer pass freely through the needle. Further, the tubing becomes kinked throughout its length.



To obviate these difficulties the following method of sterilising has been devised, the apparatus (see figure) being made for me by Mr. Richard Salt, of this department.

Before being sterilised the tubing is wound over a rounded block—e.g., an insulating terminal—and both free ends are held by screw clamps about 8 in. away. The tubing must be taut but not under tension, since the combination of heat and tension may cause rupture. After the tubing has been boiled, the tray is lifted from the steriliser and filled with cold water, since the tubing is easily damaged when softened by heat. The tubing is now cut free from the clamps with sterile scissors. With this method of sterilising, the tubing is not thickened and either of the straight ends can easily be threaded through the needle.

The apparatus is simple to make, the components being two porcelain insulating terminals 1–1½ inches in diameter, two screw clamps, such as are found in any transfusion apparatus, and a conveniently sized pan which will fit into a steriliser.

This apparatus may be obtained from Medical & Industrial Equipment Ltd., 12, New Cavendish Street, London, W.1.

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Reviews of Books

G. Vaccination in Theory and Practice

K. NEVILLE IRVINE, M.A., D.M., medical superintendent, Smith Isolation Hospital; physician to the Henley War Memorial Hospital. Oxford: *Blackwell Scientific Publications. 1949. Pp. 130. 9s. 6d.*

ow that B.C.G. vaccination is being introduced in country, it is useful to have this handbook, which ables most of the information on the experimental , the technique, and the reported results. It is documented, and any serious student of the subject find in the references all the material for a more al study. Dr. Irvine gives a balanced account of istory and theory of this method of vaccination an informative chapter on the production of the ne. On the once much-debated subject of variations ulence, he concludes, after a good review of the nce, that since about 1930 it has been impossible ural methods to produce a return of dangerous nce to B.C.G. The techniques of vaccination are described; he favours the multiple-puncture ol.

eviewing evidence of the value of B.C.G., Dr. Irvine less certain ground. The chapter on the resistance ced in animals is satisfactory, but that on resistance an is not beyond reproach: he gives the main nces and quotes the results, but his own interpre- n of those results is uncritical. Thus he quotes t comment some very high morbidity figures in inated people—figures far higher than any observed at Britain after primary infection. Detailed reading of the work cited shows that the term "mor- is applied to many cases which cannot fairly nsidered to merit it. In his "world survey" of vaccination he gives little prominence to the fact n the United States it has been decided to advise the vaccine only for persons heavily exposed to ulosis. An uncritical approach is also suggested is statement that "in parts of Poland and Czecho- akia as many as 50% of the children are said to evidence of tuberculosis"—which clearly meant. ally, that half the children were tuberculin-positive. these minor defects Dr. Irvine's book is a ble and welcome work of reference.

Medullary Nailing of Küntscher

LORENZ BÖHLER, M.D., director of the Hospital for Accidents, Vienna; professor of surgery, University of Vienna. London: Baillière, Tindall & Cox. 1948. Pp. 386. 38s. 6d.

A REALLY new method of treating fractures is so rare that Küntscher's introduction of the medullary nail in 1940 naturally evoked a wave of enthusiasm; but for various reasons medullary nailing has never achieved or retained in English-speaking countries the instant popularity it won in Europe. Hence orthopædic surgeons in England and America—who owe so much already to Professor Böhler, and appreciate the frankness and honesty of his statements—will be glad to have this critical appraisal of the place of the medullary nail in the treatment of every kind of shaft fracture of the long bones. The work is published as an independent third volume of his famous treatise on fractures, and is faithfully translated by a former assistant, Dr. Hans Tretter, now of New Jersey.

Böhler himself was greatly impressed by the method. "It became immediately evident to me," he says, "that he [Küntscher] had found the technique for the treatment of properly selected shaft fractures of long bones . . . a method for which I had been waiting a long time . . ." But the key words here are "properly selected," and we are given the usual trenchant Böhlerian dicta laying down precisely just which fractures are to be nailed, and which not, and the dangers and contra-indications of the method in general. We are reminded that shocked patients do not stand the operation well, that the peace of the dying should not be disturbed by hammer blows, and that hour-long wrestling matches are to be avoided. He holds that closed nailing is indicated mainly for transverse fractures of the middle third of the femur, and for localised osteitis fibrosa-cystica of this bone; and open nailing only for fresh compound fractures of the femur and for old femoral malunions and pseudarthroses. In all other cases the disadvantages outweigh the advantages, and disasters of one kind or another are never far away. Nevertheless he gives a clear account of the operative technique for the nailing of every long bone; and the book can be used, if so desired, as a reference volume for just this purpose. He employs fluoroscopy during reduction and nailing far more freely than would be welcome in this country.

overlooked by omitting radiological examination of other parts of the skeleton.

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D.D.T. POISONING IN MAN

A SUSPECTED CASE

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THE use of 2, 2 bis (p-chlorphenyl) 1, 1, 1. trichlorethane (D.D.T.) as an insecticide has become so general, and toxic symptoms in man have been recorded so rarely, that it is thought worth recording another possible case.

In poisoning by D.D.T. in animals the main toxic effects seem to fall on the liver and sometimes produce hepatic necrosis. The kidneys are also affected. There are loss of weight and ill-defined damage of the nervous system, accompanied by convulsions and sometimes damage to the anterior-horn cells (Draize et al. 1944, Woodard et al. 1944).

Wigglesworth (1945) recorded the first case of D.D.T. poisoning in man. The victim had been exposed to a high concentration of D.D.T. in acetone and had obviously absorbed much through the skin. He complained of heaviness and aching in the limbs, sleeplessness, spasms of great nervous tension, extreme fatigue, prostration, and twitching of the muscles over the whole body. For a long time his symptoms were thought to be due to a neurosis, until it was recognised that he had run the risk of absorbing a great deal of D.D.T. and this might be their cause.

Case (1945) found that Service personnel exposed to a high concentration of D.D.T. were liable to have fatigue, aching of the limbs, irritability, emotional instability, and violent cramp in the limbs. This finding suggests that the symptoms in Wigglesworth's (1945) cases were genuinely due to D.D.T. despite their resemblance to an anxiety state. Case mentions that one person, who was not hypochondriacal, was so prostrated that he had to take to his bed. Among other symptoms noted by Case were "yellow vision" in one person and diminution in auditory acuity in another.

The most striking feature in man has been the mental symptoms, and the following case is no exception.

CASE-RECORD

A man, aged 32, who had been a demonstrator of D.D.T. powder for the Ministry of Agriculture for six years, had handled and inhaled the powder, but not to the extent of what is generally thought to be a toxic hazard. His previous history was perfectly normal and, so far as can be ascertained, he had been free from any nervous breakdown or temperamental difficulty. About three months before consulting a doctor he had noticed periods of extreme fatigue and prostration while walking. He often felt an intense desire to sit down and an inability to take any exercise without a rest. He had noticed a tendency to emotional instability and weeping, and at the same time was getting cramping pains in his limbs varying from day to day and from limb to limb. The pain lasted twenty minutes on one occasion and three or four hours on another.

On examination no abnormality in his central nervous system was found except a slight tremor of the outstretched hands, and his performance of mental tests was good. lipomata were found on the left thigh; these the p had not previously noticed. Polyps were found i maxillary antrum.

Investigations.—The blood picture was normal. A b count gave red cells 5,000,000 per c.mm., Hb 107%, cells 9,200 per c.mm. (differential count and platelets nor The erythrocyte-sedimentation rate (E.S.R.) was 24 m 1 hr. (Wintrobe). A urea-clearance test and straight r graphy of the kidneys were normal. The urine cont albumin, red cells, and granular casts. The blood was 38 mg. per 100 ml. Lumbar puncture produced n cerebrospinal fluid under a pressure of 120 mm. H_2O, taining 2 lymphocytes per c.mm. and 30 mg. of protei 100 ml. The Wassermann reaction was negative. fasting venous blood-sugar was 90 mg. per 100 ml. The b lead was normal, serum-sodium 335 mg. per 100 ml., se potassium 17 mg. per 100 ml., serum calcium 9·7 mg. pe ml., plasma-chloride 626 mg. per 100 ml. (as sodium chlo plasma-bicarbonate 56 vols. % (as CO_2-combining po plasma inorganic phosphorus 3·7 mg. per 100 ml., and pla protein 6·7 g. per 100 ml. All these figures are within no limits All liver-function tests were normal, as lik were an electro-encephalogram, an electrocardiogram, a radiogram of the skull.

Treatment and Progress.—The lipomata were removed the thigh. The patient made a complete recovery cramps and weakness, and after a fortnight in hospital discharged with slight feelings of nervous tension, albumi (the red cells and casts had disappeared), and an E.S. 12 mm. in 1 hr.

DISCUSSION

Extreme mental fatigue and anxiety, cramps, tremor have been reported in all human cases of D. poisoning so far published. Weakness and ner tension have also been observed in D.D.T. poisonin some animals (Woodard et al. 1944). Since D.D.T. been thought to produce hypoglycæmia in animals to decrease liver glycogen, the fatigue may possibl related to a lowering of blood-sugar (Judah 1949). was not shown in the present case.

The mental symptoms may be due to the di effects of D.D.T. on the brain. Philips and Gilman (19 showed that curarised animals injected with le doses of D.D.T. had convulsive seizures, as shown electro-encephalography. Whether this action is du an upset of enzyme activity connected with tis respiration is not known.

Pathological and biochemical investigations in t case were strikingly normal, except for the finding casts and red cells in the urine. It is impossible to whether this renal damage and the raised E.S.R. w caused by D.D.T. poisoning. In animals, especia rabbits, renal damage and nephritis have b reported.

A lowered blood-calcium level has been reported some cases of D.D.T. poisoning in animals, but in t present patient the blood-calcium level was normal.

Though it is impossible to ascribe the present patien symptoms with certainty to D.D.T., the facts that had worked with D.D.T. fairly intimately for six ye and that his symptoms agreed so closely with th previously observed in D.D.T. poisoning make this t most likely diagnosis.

A periodical medical examination of all persons work regularly with D.D.T. is advisable. Judah (1949) h confirmed experimentally that calcium gluconate affor partial protection against D.D.T. intoxication.

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This requirement is in itself an obstacle to the wide use of the method here, where it is mainly applied to fractures of the upper third of the femur, which lend themselves to open reduction and nailing under direct vision. It is evident, too, that intramedullary nailing can be given a fair trial only in a highly organised fracture service where the staff are familiar with exact reduction of limb fractures in traction apparatus and with operative fixation under conditions of the greatest security. There are not many such institutions in Britain; and Böhler does us—and our patients—a service in making it clear that the surgeon who embarks on an occasional nailing without being prepared for every possible complication is heading for trouble.

The People of Great Russia

GEOFFREY GORER; JOHN RICKMAN, M.D. London: Cresset Press. 1949. Pp. 236. 10s. 6d.

ANY contribution to the understanding of Russia is likely to benefit international attitudes today; but it is hard to say how much this book contributes. The first half consists of beautifully written sketches of Russian peasant life in 1916, by Dr. Rickman; the second is Mr. Gorer's anthropological study of the Great Russians in relation to national character, cultural pattern, and upbringing. The one really important scientific contribution which this joint authorship produces is Mr. Gorer's suggestion that the practice of infant swaddling, which has never been studied fully in terms of psychodynamics, can account for a great many features of Great Russian character structure. This interesting idea deserves careful study and documentation which, in this book, it unfortunately does not get. Mr. Gorer's data seem to come largely from interviews with a limited number of émigrès, and from Russian party publications; and neither he nor Dr. Rickman produce any first-hand data about conditions in contemporary post-Bolshevik Russia—where such gross economic and social changes as the collectivisation of farming and the suppression of the kulak peasant element have almost certainly altered the pattern seen by Dr. Rickman in 1916. Mr. Gorer ends with some large political generalisations about West–East relations, which lack the caution which traditionally accompanies scientific study. He claims attention far more for his originality as a tracer of broad outlines than by his capacity for painstaking factual research. In spite of the difficulties of penetrating the Iron Curtain, it should be possible to obtain better evidence (than that which Mr. Gorer presents) of the state of child upbringing in Soviet rural communities. In its final effect, the book both stimulates and disappoints.

L'hyperazotémie

dans les malformations des voies urinaires chez les enfants. G. LAURET, assistant d'urologie à la clinique médicale des Enfants Malades, Paris; H. BOISSIÈRE, assistant des Hôpitaux de Paris. Paris: Doin. 1949. Pp. 94. Fr. 450.

MUCH work has of late years been done in many countries on the congenital malformations of the urinary tract. Hardly any other group of surgical problems sets such technically difficult tasks to the surgeon, if he is to complete his investigations and begin his treatment at the very early age necessary to avoid irreparable damage to the excreting mechanism of the kidney.

This short but interesting book describes sixteen such cases. It is mainly concerned with the body chemistry as showing the original state of efficiency of the kidneys and, more important still, whether this efficiency is changing. To anyone who has worked on this subject it is hardly necessary to explain that in many of these children the condition was such that no conceivable surgery could set it right. In addition there were frequent refusals of operation and even of investigations. The most important clue to kidney action is, of course, the amount of urea in the blood, an increase of which the French call *hyperazotémie*. There is no exactly equivalent term in common use in this country, the word uræmia conveying the idea of an advanced and dangerous stage. The method of estimating the amount of urea is the well-known one employing sodium hypobromite, and samples are taken indifferently from the blood or the cerebrospinal fluid.

Throughout the book there is a typically Fren clarity in the account of the clinical, as well as t chemical, aspect of the cases. A distinction is dra between the increased blood-urea due to relieval blockage and that showing permanent destruction kidney substance. There is also a warning, the urgen of which any surgeon experienced in such cases w appreciate, about the deceptive state of apparent heal that may coexist with a raised blood-urea. In such cas the slightest surgical stimulus may precipitate a fat uræmia.

This book is not of primary importance, but it very well worth studying.

Documenta Ophthalmologica (Vol. III. The Hagu Dr. W. Junk. 1949. Pp. 327.).—The third of these volum of collected monographs recording advances in ophthalmolo is edited, like its predecessors, by F. P. Fischer, A. J. Schæff and Arnold Sorsby. This time the contents include mo of the papers read at the conference on colour-vision held Cambridge in 1947. The sixteen contributions are all English; they include one by Selig Hecht, whose death commemorated in an appreciation by Hamilton Hartridg The present state of the trichromatic theory is discussed W. D. Wright, the polychromatic theory by Hartridge, t laminar pattern of the lateral geniculate nucleus by W. Le Gros Clark, increment thresholds and the mechanism of colour-vision by W. S. Stiles, colour-vision in t central fovea by E. N. Willmer, and the analysis of retin elements by the micro-electrode techniques by Ragn Granit.

Fractures and Dislocations in General Practic (2nd ed. London: H. K. Lewis. Pp. 290. 21s.).—M W. D. Coltart, who has revised Mr. John Hosford's boo admits in his preface that any improvement in the treatmen of fractures is due to the development of organised service Since these take such cases out of the hands of gener practitioners, the value of a book of this kind is open t question. The doctor who likes to know about the technica procedures of others may enjoy it, but it might have bee more useful to stress the ways in which his initial managemen of the fracture case can decisively influence the end-resul of the specialist's treatment. He may miss a fracture b taking a fractured scaphoid for a sprained wrist, or a broke femoral neck for a bruised hip—instances where delay has malign influence on outcome. He may fail to take seriousl enough complaints made by patients after their return hom in plaster, though these may be warnings of vascular stasi or pressure necrosis. Above all, he may not insist on th everyday use and exercise of the fractured limb in plaste so vital for restoration of function. These—which should b the cardinal points in a little book of this kind—are onl to be found embedded in a mass of material more appropriat for undergraduates. The detail itself is excellent, thoug there is no mention of the invaluable Capener nail fo trochanteric fractures, and the ritual of reduction and plaste is still advised for vertebral fractures.

Doctors East and Doctors West (London: Allen & Unwin. 1949. Pp. 278. 12s. 6d.).—Dr. Edward Hume tells with considerable skill, the story of his work in laying the foundations of a Yale-in-China hospital, medical school, and training centre for nurses. Very gradually, overcoming the distrust of a suspicious and conservative people, he sur mounted immense difficulties. A disused rice store became school, and an old inn with a fine range of outhouses use for fattening pigs was transformed into a hospital a dispensary. From this beginning, in 1906, in the old walle city of Changsha development proceeded apace. That i was made possible was very clearly due to Dr. Hume careful and appreciative understanding of Chinese cus and traditions, as well as of Chinese medicine. Helped by his native assistant he learned to win the confidence and friendship of Eastern minds. Treatment by Chinese doctors of the old school, he found, was often not without success. When, long before the establishment of liver therapy in the west, Sir Patrick Manson, in Amoy, failed to benefit a patient with pernicious anæmia by his treatment, he was astonished by the success with which the case was later treated by a Chinese doctor. The prescription was for continuous and large doses of crow's liver. Goitre was successfully treated with extract of seaweed, and the livers of fat fish were prescribed for tuberculosis. Both for its picture of Chinese ways of life and for its description of Chinese medicine the book is of great interest.

THE LANCET

LONDON: SATURDAY, DEC. 24, 1949

Nutrition and Infection

ERY mother of a family, and every doctor in tice, firmly believes that the best bulwark against tion is good wholesome food. The association of rculosis with poverty and malnutrition is par- arly noteworthy. DANIELS,[1] in his Milroy lectures, rds that in the late war the countries with the st incidence of tuberculosis were those that red the greatest privations and food shortages. as HOWIE[2] points out, other factors besides ition may well have been involved. The poorly community often suffers from fatigue, low morale, iety, overcrowding, and poor hygiene, and its pital and public-health organisations are likely to lefective. Moreover, in spite of the appallingly nutritional standards in Germany at the end of war there were no major epidemics. Then again, lren brought up in apparently admirable living dietary conditions still contact measles, chicken- mumps, and poliomyelitis, and well-fed adults h colds and influenza. Poliomyelitis, indeed, s to have a predilection for young adults in llent physical condition; and the incidence appears e much higher in well-fed countries like the ed States than in, for example, the ill- ished African. It is understandable, therefore, most bacteriologists hesitate to accept the view malnutrition increases susceptibility to infection. he influence of heredity, both in the host and in infecting organism, cannot be overlooked. STER,[3] in New York, by inbreeding and selecting a common stock of mice, bred two strains h were widely divergent in their response to tion with *Salmonella enteritidis*, one strain being st completely immune to a given infective dose, other suffering almost a 100% mortality. Such eding and selection, however, did not produce tance to other organisms. The influence of dity in human infections is illustrated in the ies of KALLMAN and REISNER,[4] who showed that ne of twins over fourteen years of age has rculosis, the chances against the other contracting disease are 3 to 10 if it is a binovular twin but 9 to 10 if it is monovular (identical). SCHNEIDER[5] inguishes three types of hosts and pathogens sts that are inbred and resistant, inbred and ptible, or non-selected: pathogens that are ormly virulent, uniformly avirulent, or a mixture these. Thus host and pathogen can meet in 3 = 9 different ways. Add to this the nutritional factor of host and pathogen and the complexity of the problem is apparent.

If nutrition plays a part in the resistance to infection, one type of defence mechanism that one would expect to be affected would be antibody production, particularly as antibodies are derived from the serum proteins, which are lowered in frank malnutrition. At the end of the late war GELL[6] had an exceptional opportunity for studying the correlation between protein deficiency and antibody response. The subjects of his study were patients and prisoners from the Ruhr suffering from malnutrition—they were on a diet of only 1000 calories daily. Their antibody response, as measured by agglutination tests, was determined before and after infection with a rather bizarre mixture of tobacco mosaic virus and avian red cells, which were specially chosen because none of the subjects could have had any preformed latent immunity to them. British troops served as controls. The results showed that the well-nourished British soldier had a better antibody response than the half-starved German, but the differences, though statistically significant, were by no means as great as might be anticipated. GELL himself was astonished that they were so slight, and he concluded that "under-nutrition does not play as large a part in widespread epidemics as is generally supposed."

At one time vitamin C was thought to be associated with immunity mechanisms in the body, but the evidence is not very convincing. The early work indicating a direct correlation between blood vitamin-C levels and complement formation has not been confirmed. DEENY and his colleagues,[7] in Northern Ireland, could not establish any relationship between blood vitamin C and complement values in health or disease, and CRANDON,[8] the American research-worker who lived for six months on a diet devoid of vitamin C, had normal complement titres even at the time when he developed clinical scurvy, and he remained free from infection during the whole six months. On the other hand, the controlled experiment of GLAZEBROOK and SCOTT THOMSON,[9] in 1938 seemed to show a definite increase in the resistance of schoolboys against tonsillitis, pneumonia, and acute rheumatism—but not colds—when they were given full doses of vitamin C. There is some evidence that vitamin C is bacteriostatic, but only in concentrations that could never be reached in the blood and tissues. Even large doses of vitamin C intravenously do not increase the bactericidal power of human blood, though they are said to produce a leucocytosis. Large quantities of vitamin C are often given to patients with infections because their excretion of the vitamin is diminished, but whether the vitamin-C level in the tissues and blood of the normal person affects his susceptibility to infection or affects the virulence of the attack remains to be proved. Vitamin A has acquired the sobriquet of "anti-infective vitamin," without very firm evidence to support it, though HOWIE[2] quotes the experiment in which GREEN and colleagues[10] gave supplements of vitamins A and D to alternate women at Sheffield antenatal clinics, and found that

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d this date variously between 1800 B.C. and 1. This radiocarbon method gives the actual age . rather than their age relative to that of surroundings, but 30.000 years does not take us anywhere near the period of such relics as those lown and Swanscombe. It might be applicable Galley Hill skeleton (now considered to be e than 10.000 years old). but a large amount material would have to be sacrificed.

the British Museum (Natural History). in oration with the Department of the Government ist, has devised a method which can be applied e relative dating of bones. This depends on ct that most water draining through the subsoil ins traces of fluorine. which combines with m phosphate in the bones. The fluorine content nes as a clue to their age was discussed by LETON[10] over a hundred years ago. CARNOT[11] d by analysis that the fluorine content increased age. though owing to the different fluorine nts of the water in different localities the actual f the bones could not be determined. Lately. ver. OAKLEY[12] pointed out that the method e used for deciding whether any given bone is e same age as other bones associated with it—their relative age. This method has now been ed to Galley Hill man and Swanscombe man. OAKLEY and ASHLEY MONTAGU[13] have shown the Galley Hill remains. far from being Middle ocene, are from a comparatively recent burial, as the antiquity of the Swanscombe skull is med. The fluorine content of Middle Pleistocene (2·0%) was five times as great as that of Galley nan (0·4%) but the same as that of Swanscombe The fluorine content of the Piltdown remains lso been examined. with the following result: l bones of undoubted Lower Pleistocene age all a high content, those of later Pleistocene age l in the same bed a much lower content. and ominoid remains an extremely small one.[14] So thropus must relinquish all pretensions to being Man. But even if he disappears in that rôle nust be looked upon as a late aberration. tools of remain which date back nearly a million years.

Treatment of Polycythæmia Vera

lycythæmia vera is generally thought of as a e coming on in late middle age and disabling r than fatal. Some of the patients live for almost normal expectation of years. but a recent survey the Mayo Clinic showed that. in fact. only 36 out of atients survived after more than five years.[15] The toms of headache and fatigue are troublesome: ymptoms produced by the enlargement of the n, by the tendency to peptic ulcer. and par- arly by the occurrence of thromboses may be us. So. ever since polycythæmia vera was first guished by VAQUEZ and by OSLER about fifty ago. attempts have been made to treat the e. and the methods used have all aimed at reducing the level of red cells and hæmoglobin in the blood to normal. Many treatments have had a temporary vogue. Phenylhydrazine certainly reduced the red cells and hæmoglobin and was easy to give: but its action was difficult to control—it had a cumulative effect on the bone-marrow that was liable to replace the polycythæmia by an irreversible aplastic anæmia. Radiotherapy has been much more successful. The X rays are applied in a localised manner to the enlarged spleen or to various long bones in turn, but RICHARDSON and ROBBINS[16] considered that whole-body irradiation gave superior results and reported on 28 patients so treated. Venesection alone has been used for years: it will control the symptoms for a while. especially in the younger patients who have had no thromboses and whose platelet-count is normal. But sooner or later venesection fails to reduce the circulating red-cell mass, and this state of affairs is sometimes shown by a fall in hæmoglobin without a corresponding reduction in red cells. Venesection is always likely to have its place in any scheme of treatment and is especially useful for quick relief of symptoms. Nitrogen mustards have been tried for polycythæmia. but the results have not been encouraging.[17] A suggestion from Egypt[18] that artificial infection with ankylostoma will control polycythæmia is unlikely to be pursued very far. in temperate climates at least.

Of the recent means of treatment. radiophosphorus (P^{32}) is. in LAWRENCE's view. far and away the most useful: he has been using radiophosphorus for ten years and in a recent survey[19] gives much evidence to support his opinion. The radiophosphorus is given intravenously in the form of a radioactive sodium phosphate. and a " course " of treatment varies from 3 to 6 millicuries according to the severity of the disease. Of his 121 patients most (86%) had been treated in other ways before having P^{32}: the average age of the series was 50·7 years. but the ages ranged from 19 to 75. For diagnosis an initial red-cell count of 7 million per c.mm. at least was required: immature white cells, mostly myelocytes, were found in the blood of 38% of the patients. and 69% of these had received previous treatment. Hypertension was noted in 33%. peptic ulcer was present in 11%. and 15% of the patients had had some form of thrombosis. It soon became clear that a single course of P^{32} would control some patients for long periods. In the first four years 30 patients received radiophosphorus, and since then these patients have, on average. needed a further course every three years: of the patients treated in the first five years 28% have needed only one course and have gone four to eight years without fresh treatment. There is some evidence that P^{32} reduces the incidence of thrombosis: this complication occurred in about 4% of the patients. whereas the average incidence with other forms of treatment has been about 25%: LAWRENCE relates this improvement to the ability of P^{32} treatment to keep red cells, hæmoglobin. blood-platelets. and blood viscosity all within normal limits. Of the 121 patients 21 have died, and 5 of these died from chronic or acute myelogenous leukæmia. Radiophosphorus has

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18. Nagaty, H. F., Zanaty, A. F. *Trans. R. Soc. trop. Med. Hyg.* 1949, 42, 495.
19. Lawrence, J. H. *J. Amer. med. Ass.* 1949, 141, 13.

the subsequent incidences of puerperal pyrexia were 19·2% in the vitamin group and 30·9% in the controls, while the corresponding incidences of severe sepsis were 1·5% and 3·6%. As HOWIE remarks, we need more human experiments of this kind.

Much work has been done in the last decade on the effect of nutrition in experimental infections in animals. Most of it is not applicable to man, and the great diversity of experiments, often inadequately controlled, present such confusing and at times conflicting results that it is difficult to draw any general conclusions from them. Experimental work on viruses, however, has established that the virus and the cells of its host compete for nutrients that are essential for vital enzyme mechanisms in both. If the virus prevents the host cells from utilising these essential nutrients, and appropriates them for its own purposes, then the host cells will suffer and may eventually die. Conversely, if the virus is starved of some of its essential nutrients it cannot live. Viruses thrive best in tissues whose metabolism is active—as in the developing hen's egg—and the typical picture of several virus diseases in animals can be markedly altered by a variety of dietary deficiencies.' Animals on diets deficient in members of the vitamin-B complex, such as thiamine, pantothenic acid, and riboflavine, often show a heightened resistance to some viruses, such as that of poliomyelitis, so that if they do become infected the disease runs a mild course. This and the low incidence of poliomyelitis among poorly nourished people may be examples of "starving out the virus." With bacterial and protozoal infections a deficiency in vitamin-B complex generally increases susceptibility to infection. Lack of some members of the B complex—for example, folic acid—produces leucopenia, which interferes with phagocytosis. Pyridoxine deficiency inhibits protein synthesis and might therefore conceivably affect the formation of antibody globulin. Interesting as these experimental observations are, we must guard against the assumption that they have an immediate application to human problems. Nevertheless, HOWIE [8] suggests that experiments on mice "offer the best hope of giving shape to the present vague mass of information."

The Age of Bones

IN the past the dating of fossil human bones has chiefly been based on studies of the geological strata in which they lay and the associated fauna, flora (pollen-analysis and dendrochronology), and impedimenta (mostly tools and pottery). But the question always arises whether human bones belong to the same epoch as the environment in which they are found or whether they have been introduced afterwards by burial or otherwise. When, as is often the case, the bones are found in a quarry, it is usually impossible to look for the disturbance of overlying strata which will show that they were buried, because these strata have been quarried away before the bones were discovered. Apart from burial, bones of man and lower animals may be washed out of their original stratum and deposited by the stream at quite a different level. An example of burial is the skeleton of Galley Hill man found in North Kent by ROBERT ELLIOTT in 1888,[1] and an example of stream-borne intrusion is the Piltdown remains found in 1908 by CHARLES DAWSON. At the time of their discov the Galley Hill and Piltdown remains appeared to among the oldest known bones of man, yet some their features seemed remarkably modern, a which was more disturbing when most anthropolog thought that modern man had evolved from Ne derthal man. Sir ARTHUR KEITH said that Gal Hill man was "Chellean" and had been buried an older stratum from a more recent land-surface but he thought that the Piltdown remains w possibly Pliocene,[3] and they were raised to the sta of a new genus, *Eoanthropus* ("Dawn Man"). bitter wordy warfare followed and lasted for ye between anthropologists who agreed and who agreed with his views. Then in 1935 MARSTON covered at Swanscombe, in a pit near that of Gal Hill, a skull which he considered to be of "relativ early Acheulean man"—i.e., later than "Chellea but still older than Neanderthal man—though t skull contained many modern features besides so primitive traits. So it became even more imperati to find out the age of the bones relative to the stra in which they were embedded.

The age of fossil bones cannot be estimated fr the apparent amount of fossilisation or mineralisati they have undergone. As Sir ARTHUR KEITH [4] point out, when bones become impregnated with iron sa fossilisation takes place extremely rapidly. A MARSTON [5] wrote:

> "In comparing the degree of mineralisation of bone, full allowance must be made for the natur the deposits which contained the bone. The authen cated report of the petrified condition of a body whi was exhumed for reburial six years after it had be buried in a 'cement-lime' formation in Nevada show that wholly unexpected and astonishing phenome of a physico-chemical character can occur in sh periods of time. . . . Weight and hardness afford infallible criteria of relative antiquity."

In America a method of dating fossil bones by the radiocarbon content has been worked out. From t study of cosmic rays LIBBY [6] concluded that neutro produced by cosmic radiation should form radi carbon. Subsequently ANDERSON et al.,[7] using met ane from sewage, proved that this was so, an suggested that the radiocarbon content could be us for dating carbonaceous material up to the age 30,000 years. The limiting factor is the short half-li of radiocarbon (about 5700 years). Thus after nea 12,000 years the amount of radiocarbon—originall extremely small—is reduced to a quarter, and so exponentially. The amount left after 30,000 yea would be too small for accurate estimation. So LIBB et al.[8] determined the radiocarbon content of sampl of ancient Egyptian timber of known date, and th means of their determinations agreed with th expected values within 1 standard deviation uni Their maximal error was about 450 years in a sampl aged 4600 years. Finally LIBBY [9] applied the metho to timber of unknown age in Peru and put its dat at 800 B.C. ± 200 years. Archæologists had previousl

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[1] Newton, E.T. *Quart. J. geol. Soc. Lond.* 1895, 51, 505.

[2] Keith, A. The Antiquity of Man. London, 1925; pp. 250, 33
[3] Keith, A. *Ibid*, p. 503.
[4] Keith, A. *Ibid*, p 500.
[5] Marston, A. T. *J. R. anthrop. Inst.* 1937, 67, 339.
[6] Libby, W. F. *Physiol. Rev.* 1946, 69, 671.
[7] Anderson, E. C., Libby, W. F., Weinhouse, S., Reid, A. F., Kirshenbaum, A. D., Grosse, A. V. *Science*, 1947, 105, 576
[8] Libby, W. F., Anderson, E. C., Arnold, J. R. *Ibid*, 1949, 109, 227.
[9] Bushnell, G. H. S. *Antiquity*, 1949, 23, 229.

Dr. McCleary says of the sixpenny :

> "Sometimes he was English: not infrequently he was ish; more rarely he was coloured; often he spoke an Irish accent. Usually he began with what was a 'nucleus' and if successful he would develop his into a lucrative practice, which he would sell and the proceeds buy a practice in a genteel suburb. . . ."

ny doctors worked exceedingly long hours, at speed, doing their own dispensing from stock es—for a bottle was a part of the bargain. imes they gave *Saccharum Ustum*, "a medicament possesses in a high degree what Hippocrates down as the first essential of medicine—that it should no harm." Dr. McCleary, who served as a locum in such practices, is cheerfully unrepentant about bottles of burnt sugar.

> "When I think of the vast quantities of heart-depressing drugs that are swallowed annually in self-medica- by an unreflecting public, I recall with satisfaction dispensing of *Saccharum Ustum* with its reassuring and complete harmlessness of effect."

he worked in a practice in North London where were two waiting-rooms, one for the sixpenny ts and another for those who could afford to pay shilling. The doctor saw two shilling patients for ry sixpenny patient, so the higher fee saved the ient a wait. The clientele in the two rooms varied rding to the ready money at their disposal at the e: there was no feeling of class distinction about it.

Dr. McCleary would not have us think these doctors re inefficient or careless:

> "Some of the men for whom I worked were skilled, onscientious, and laborious, who loved their work and did heir best for their patients. They had developed a time-aving technique and a flair for distinguishing the important rom the unimportant."

suggests that Flaubert might have made a classic the life of one of these doctors. Some will recall ess ambitious work—*Sixpenny Pieces*: the modest ute of Neil Lyons to Harry Roberts, in Stepney.

ADRENOCORTICOTROPIC HORMONE AND HYPERSENSITIVE REACTIONS

It is sometimes forgotten that the symptoms of disease produced not directly by the external or internal ious agent which is acting but by the body's reactions hat agent. Even when there is a definite bacterial or cause, the clinical picture—the malaise, fever, pain, local inflammation—is that of the body's attempt to bat the attacker. In some diseases, of which those ed allergic are the most striking example, though they include the rheumatic group, periarteritis nodosa, others—the body's reaction is out of all proportion the severity of the attack and is therefore called a ypersensitive" reaction. In these, if the reaction can abolished the "disease" is cured—at least for the being. A few years ago Hughes[1] suggested that in te rheumatism any "poison" which would abolish body's reactivity without doing any permanent m would produce a cure: in his view this explained action of salicylates in rheumatic fever.

The same principle—of treating disease by moderating body's reaction—is behind the use of antipyretics in eral, and of 'Cryogenine' in particular; and Dr. offrey Bourne showed in these columns last week that uction of temperature with this drug can improve e condition of patients with lymphadenoma, rheuma- id arthritis, or tuberculosis.

The vast amount of work being done in the U.S.A. th A.C.T.H. and 'Cortisone' suggests that one impor- nt effect of these substances is to block hypersensitive reactions. This may explain the observations made (though still unpublished) in a wide variety of diseases, that A.C.T.H. immediately abolishes the malaise associated with them; it may also be the basis of the good results reported by Hench and his co-workers[2] in rheumatoid arthritis and acute rheumatic fever. Moreover, Bordley and his colleagues[3] at Johns Hopkins have now reported remarkable results with A.C.T.H. in allergic diseases. The rapid recovery of a patient critically ill with exfoliative dermatitis due to iodine led them to try A.C.T.H. in a case of penicillin sensitivity of serum-disease type, in which the giant urticaria, joint pains, and fever disappeared within 24 hours. They then obtained equally rapid relief in five patients with severe chronic asthma which had not responded to adrenaline, theophylline and ethylenediamine, or rectal ether. In four of these the symptomatic improvement was accompanied by the return of a pale œdematous polypoid nasopharyngeal mucosa to an appearance not far from normal. In accordance with the experience in rheumatoid arthritis, the patients tended to relapse 2–3 weeks after their course of treatment.

THE "BURR" RED BLOOD-CELL

HÆMATOLOGISTS are familiar with the spherocyte, the round fat red cell of hæmolytic anæmia, and with the "target" cell, the thin red cell of Mediterranean anæmia, so thin that its sides clap together somewhere about the middle and make it look, in transmitted light, like a Scottish shield or target. Then there are the sickle-shaped cells associated with a familial anæmia in negroes, the oval cells which are also familial, and one or two other odd shapes of no particular diagnostic import have been described from time to time. The latest addition is the "burr" cell of Schwartz and Motto,[4] which is said to be found only in patients with certain diseases, particularly where kidney function is impaired.

The burr cell is a kind of poikilocyte. It is a red cell of normal size with one or more spiny projections along its edge; the projections are quite long, varying from about a sixth to half the diameter of the red cell, and photographs show that they are usually sharp and pointed. So it does vaguely resemble the burrs that stick to our clothes or the coats of our dogs. Burr cells are not just crenated cells; they are fairly evenly scattered over the blood-film, whereas crenated cells tend to accumulate in groups. The blunt-processed burr cell may well be difficult to distinguish from a crenated cell, so no cells should be counted as burr cells unless they are apart from crenated groups. Schwartz and Motto found burr cells in the blood particularly in cases of uræmia, carcinoma of the stomach, and bleeding peptic ulcer. Out of 75 uræmic patients 54 had burr cells in their blood smears; out of 50 with carcinoma of the stomach 34 had burr cells; and the cells were seen in 27 out of 50 patients with bleeding peptic ulcer. Two control series were studied; the first comprised 100 consecutive blood-films from patients admitted to the medical wards for some condition other than a blood disease; the second was made up of 100 patients who had some hæmatological abnormality. No burr cells at all were found in the first group, whereas 21 patients in the second group had them, and the only common factor in these 21 patients was renal impairment.

What it is that causes red cells to throw out spinous processes has not yet been determined. Severity of the anæmia, duration of bleeding, degree of nitrogen retention, dehydration, age, sex, and race, have all been not reduced the incidence of leukæmia in patients with polycythæmia vera, but on the other hand it has not increased it, as might have been anticipated; nor is there any evidence that this treatment has increased the subsequent incidence of neoplasms.

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[1] Hughes, W. *Ann. rheum. Dis.* 1942, 3, 89.

[2] See Leading article, *Lancet*, July 23, p. 159.

[3] Bordley, J. E., Carey, R. A., Harvey, A. McG., Howard, J. E., Kattus, A. A., Newman, E. V., Winkenwerder, W. L. *Bull. Johns Hopk. Hosp.* 1949, 85, 396.

[4] Schwartz, S. O., Motto, S. A. *Amer. J. med. Sci.* 1949, 218, 563.

The average age of the patients treated with P^{32} who died was 67 years, and this is nearly the normal expectation of life for a group of average 50·7 years; it compares well with the expectation of life of patients with properly controlled pernicious anæmia or diabetes. Apart from P^{32}, the only other remedy used in this series was venesection, which was needed in rather less than half the patients to control urgent symptoms, since radiophosphorus takes several weeks to produce its full effect. These are very striking figures, the reduction of thromboses being the most important effect, and the one probably responsible for the notably increased expectation of life—and useful life at that. Other treatments have produced long remissions before, and they are not remarkable in such a chronic disease. We are not told how often the treatment was given to the 72% of patients treated in the first five years who did need more than one course, and LAWRENCE does not mention any failures—perhaps there were none.

In Belgium SIMON and HENRY [20] have given radiophosphorus by mouth to four patients with polycythæmia who had been ill for some years and deri no benefit from various other treatments. T patients were treated as outpatients. The rad phosphorus was given in fruit-juice on an em stomach, the initial dose being 6 millicuries, except one case in which the patient had previously underg radiotherapy, thus introducing the risk of excess reaction. A month later three of the patients w given a further 4 millicuries. The fourth patient w not given a further dose, because the blood pict had become normal. After eight months the blo pictures of all four patients were satisfactory and troublesome symptoms had disappeared.

It is clear that in polycythæmia vera radioph phorus has produced first-class results—its only real sustained therapeutic success. Proper precautio must be taken when handling P^{32}, and its short ha life of 14 days means that supplies must be availal at short notice; for clinics near one of the aton centres this may not be difficult to arrange. In t country supplies are controlled through the Medic Research Council,[21] and they are unlikely to ag to provide P^{32} unless they are satisfied that th who are handling the material will be prope protected. Nevertheless physicians here should now able to arrange for any suitable cases to ha this treatment.

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[20] Simon, S., Henry, J. *Acta clin. belg.* 1949, 4, 382.

[21] See *Lancet*, 1948, ii, 469.

Annotations

PREVALENCE OF CORONARY DISEASE

THE apparent increase in deaths from coronary disease in recent years, particularly among the younger age-groups, is a disturbing observation which the lay press has not been slow to publicise. The haste and competition of modern industrial life, with its train of frustration, anxiety, and mental fatigue, contrasted with the less exacting conditions "enjoyed or endured by our more slowly moving agricultural forebears," seems an obvious cause for increase, but Ryle and Russell,[1] from their clinical and epidemiological survey covering the last twenty-five years, show that this is by no means the whole story. Indeed, the Registrar-General's statistics reveal that the mortality from coronary disease is now increasing less rapidly than before the late war, that people are tending to live longer, and that a changing fashion in death certification may largely account for the figures. Because of the wider familiarity with the clinical features of coronary thrombosis and the improved facilities for confirming the diagnosis—e.g., by electrocardiography and necropsy study—many deaths previously certified as due to myocardial and cardiovascular degeneration are now specifically grouped under coronary disease. Nor is there any good evidence that cigarette smoking in the hard-pressed citizen of today bears any causative relation to the deaths from coronary disease, for non-smokers are not immune. The notable dominance of those occupations which involve much mental activity and responsibility is revealed in the decrease in mortality figures with descent in the social scale. This same socio-economic influence seems to explain why the death-rate from coronary disease is five times as great in middle-aged men as in women of the same age-group. Recent emphasis given to the incidence of coronary disease in young adults by the publication of cases which occurred in the Forces in the war [2] may have given an exaggerated picture, for when reviewed statistically coronary disease is very rare at or below the age of 35.

There is no condition in medicine where the progn is more difficult to assess. Heredity, age, occupati evidence of extensive arterial disease, or hypertens are only a few of the factors which have to be tak into account. Even when every feature of the case favourable, early sudden death may occur; yet converse is as often true, and Cassidy [3] reported on t patients who survived for more than 30 years. It see to be on the lines of prevention that the future n hold most hope, through periodic health examinati and the organised regulation of conditions of work personal leisure—always providing that these measu can be put into operation without interfering too m with individual freedom. But we cannot afford to ign the dietary factor, to which Dr. Closs and Dr. Dedic again draw attention in o -ndence colun this week. Evidence is hyp cholesterolæmia has a significant bearing on the ætiol of arteriosclerosis, and cholesterol metabolism can influenced by the amount of fat and protein in diet, by the lipotropic and oxytropic fractions of vitamin-B complex, and by thyroid extract. It is unreasonable to foresee a future enterprising Minis of Food paying closer attention to these compone of the nation's diet.

THE SIXPENNY CONSULTATION

THE sixpenny doctor has long been an almost fabul memory; and his modern equivalent vanished with coming of the National Health Service. But so remember him, among them Dr. G. F. McCleary, w has lately given us Some Medical Memories.[4] Sixpen practices were flourishing at the turn of the century in London slums, and many doctors went into them for mere purpose of making enough to get out. A f stayed and served their patients for the best part of lifetime, and their service was good even by mode

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[1] Ryle, J. A., Russell, W. T. *Brit. Heart J.* 1949, 11, 370.

[2] French, A. J., Dock, W. *J. Amer. med. Ass.* 1944, 124, 1233. Newman, M. *Lancet*, 1946, ii, 409.

[3] Cassidy, M. *Lancet*, 1946, ii, 587.

[4] *Fortnightly*, December, 1949, p. 409.

Special Articles

TAKING THE CURE

OBSERVATIONS AT SOME FRENCH SPAS

HE effect of Epsom salts has long been obtainable hout visiting Epsom ; and the modern English or erican doctor is disposed to think that his patient get all the benefits of spa treatment from a bottle, oliday, and perhaps some physical treatment in the patient department. With so many potent remedies is disposal, he has little use for the vaguer influences irs, waters, and places, and he mistrusts the elaborate rts of spa physicians to explain these influences in hemical terms. Though many of his own methods in fact just as empirical, he is apt to feel that spa tment, as such, belongs to the unscientific past.

nder its new scientific management, medicine of course be remarkably successful in dealing with able illness: the system provides investigation, tment, and reablement, after which the patient urns to work with the minimum of permanent dis-lity compatible with his original disease. But as our erest gradually turns to the vast residuum of chronic l degenerative disorders—cardiovascular, rheumatic, mentary, and psychological—the picture seems less ght. Not unnaturally, the doctor of today concerns self more with the diseases he can cure than with se he could at best relieve, and the very success of remedies where they are applicable favours thera-tic nihilism where they are not. The question will reasingly be asked whether hospital medicine as now ctised offers "chronic" patients anything as satisfy- as the annual cure which some of them formerly k at health resorts—the overhaul and assessment, l the three or four weeks of active treatment and t, during which they could go into the physical uivalent of a spiritual "retreat."

This religious parallel is the more relevant because many ways the spa is a survival or revival of the aples of healing where medicine was practised by ppocrates and his successors. As in the old days, medicinal waters are the centre of a medical organisa-n, with its priests and ministrants ; and, as in the days, the doctors have many aids at their disposal ides the actual waters. The patient may gain ch from his transfer to peaceful and pleasant surround-s; or from a change of climate ; or from the know-ge that he is having positive treatment ; or from the e of a physician with special experience of his com-int; or merely from the atmosphere of confidence hin the therapeutic temple.

The emphasis differs from place to place. There are s where it is all on the natural waters, and where ything combines to make the patient believe that he recover if he washes 21 times in Jordan, wing the precise rules prescribed. There are ers where the physicians have little faith waters of any kind, but offer instead the est equipment in their specialty. On the one nd there is the simple temple of healing, ch as it was when the Romans left it : on e other hand there is the modern Rheumapolis or Nephropolis, with its investigations complete as in any great hospital, and its atment even more elaborate. Likewise there e patients to whom one of these kinds of a is more useful than another.

In France, where medicine preserves more f its traditional pattern than in England, "the re" still takes a big place in the medical e of the people. Certain tendencies and differ-ces in its application will be evident from e following sketch of some of the principal French spas which were visited this summer by a party of English physicians led by Lord Moran.

Eight Examples

It will be seen that, like our own Bath, several of the spas of France were flourishing health resorts under the Romans ; indeed they were a characteristic feature of Gallo-Roman civilisation. Even their renaissance is of respectable antiquity, for already in 1604 Henri IV thought it necessary to appoint a *surintendant général des fontaines*, and for three centuries after that the care of medicinal springs was continued by official medical inspectors. The story of the last hundred years has been largely that of specialisation : instead of accepting patients of every kind, the various spas have tried to ascertain which disorders they particularly benefit, and why ; and to a greater or lesser extent all concentrate on particular diseases or diatheses. In so far as the differences between spas and their waters are significant, the policy of specialisation is justified and necessary : it naturally appeals to patients, who like to believe that a particular resort was designed by Heaven for the treatment of their particular malady : and it has made for progress in the development of individual methods. But some think this policy can be carried too far : the spa, they say, should not concern itself exclusively with the disorders of a single organ, but rather with the patient's general condition and functions, which a cure may be able to modify.[1]

Each of the following "thermal stations" has fairly definite indications of its own, though some of them overlap.

ROYAT

Emerging abundantly from the volcanic mountain plateau of the Auvergne in Central France, the waters of Royat-les-Bains are warm (up to 35°C) and contain much carbon dioxide both as bicarbonates and as free gas. They were used by the Romans, and in the Middle Ages ; but the present spa dates from the 1850s, and its specialisation in cardiovascular disorders from 1905. The waters have diuretic and other properties, but their principal use is in baths, designed to modify circulatory responses. Though the waters are employed in their natural form—they are seldom heated and never charged with additional gas—different physiological effects are obtainable with water from the different sources, and with water from the same source before and after storage, and also by giving baths of still or running water, with or without douches. Thus a bath in the water from the Eugénie source which has lost most of its free gas by storage, and has a temperature of 33–34°C, is vasodilator and hypotensive, whereas a bath in fresh gaseous Saint-Mart water at 28–29°C is stimulating and

Background to Royat.

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[1] Chabrol, E. Doctrines thermales. Paris, 1936 ; p. 98.

considered and rejected. Hypoproteinæmia and the presence of blood in the intestinal tract may have something to do with it. Schwartz and Motto think that burr cells can be valuable signposts in the study of the anæmias, though in their patients the diagnoses seem all to have been well-established. Still, it does not take very long to look for burr cells and no special technique is needed —so hæmatologists will be on the look out for them.

THE FOOD WE EAT

IN each of the past ten years, we are told, the average calorie value of the food going into consumption in this country has been within 200 calories of the pre-war total of 3000 per head per day. This constancy is indeed remarkable; but it also shows how deceptive averages can be. For, as we all know, the effect of rationing, price control, and redistribution of incomes has been to spread food-supplies throughout the community more evenly than ever before. And the sources from which the calories are obtained have also altered.

In a sequel to earlier accounts[1] the Ministry of Food carries the story of our food consumption forward to June of this year.[2] The report puts the average daily calorie value of the food distributed in 1948 at 2890, and in 1948–49 at 2980. The Ministry's estimate of the weighted average requirement in 1948, based on American tables,[3] is 2560 calories. This average, unlike the first, is for food actually consumed. There's many a slip 'twixt the ship and the lip, and the Ministry's figure for food distributed takes no account of waste at the retailer's or in the household (apart from such obvious causes as potato peeling). This waste may amount to as much as 10% of the total; so we have no surfeit.

Taking pre-war annual average as 100, the recent civilian intake per head per day is as follows:

	1946	*1947*	*1948*	*1948–49*
Calories	96	96	96	99
Protein: Animal	104	101	96	95
Vegetable	124	128	125	128
Total	113	114	109	110
Fats from all sources	*86*	*81*	*83*	*81*
Carbohydrates	100	101	105	108

The following figures show, in percentages, the various sources of calories:

	Pre-war	*1946*	*1947*	*1948*	*1948–49*
Dairy products (excluding butter)	9	11	11	11	11
Meat (including canned meat and bacon)	17	13	12	11	10
Oils and fats (including butter)	17	11	13	15	15
Sugar and syrups	15	12	13	13	14
Potatoes	4	7	7	6	6
Grain products	30	35	36	37	36
Other foods	8	8	8	7	8
Total	100	100	100	100	100

By weight in lb. per head per annum the average consumption has been computed as follows:

	Pre-war	*1946*	*1947*	*1948* (provisional)	*1948–49* (provisional)
[illegible]	*38·3*	*49 4*	*48·7*	*49·0*	*50 6*
[illegible] bacon, and ham) (as edible weight)	109 6	89 9	82 0	73·8	69·8
Fish, poultry, and game (edible weight)	32·8	34·3	36 3	37·0	35·1
Eggs and egg products (fresh-egg equivalent)	24·0	21·9	20·9	21·4	22·0
Oils and fats (visible) (fat content)	*45·3*	*34·7*	*33·9*	*38 1*	*40 6*
Sugar and syrups (sugar content)	109·9	79·1	85·0	85·9	91 2
Potatoes	176·0	282·0	284·1	242 1	266 3
Pulses and nuts	9·6	6·1	7·9	5·4	6·9
Fruit (including tomatoes) (fresh equivalent)	141·4	109·8	132·4	133 2	128·6
Vegetables	107·5	115·8	114·0	114·7	115·6
Grain products	210·1	237·8	240·2	250·2	252 8
Tea, coffee, and cocoa ..	14·7	15·7	15·2	13·2	13·5

In 1948–49 the distribution of fats was nearly [illegible] above the level for 1946, and butter (12·5 lb. in the y[illegible] *was at its highest level since the start of the war,* tho[illegible] still only half the pre-war total of 24·8 lb. Sugar (91·2 [illegible] was also higher than at any time since the start of [illegible] war, but was still substantially below the pre-war fi[illegible] of 109·9 lb. Since 1946 consumption of liquid milk [illegible] risen by 7%; *compared with before the war it has* r[illegible] by 55%, and consumption of dairy products as a w[illegible] by 30%. In terms of "shell-egg equivalent," the amo[illegible] distributed in 1948–49 was only 8% below the 193[illegible] level.

ARMS AND DISEASE

Timor mortis conturbat me, complained the p[illegible] Whoever stops to consider the number and press of [illegible] dead is liable to [illegible] it seems so dange[illegible] *to be alive.* P[illegible] who last Decem[illegible] began to recount the story of wars and epidemics, c[illegible] pleted it in his two final FitzPatrick lectures deliv[illegible] at the Royal College of Physicians this month. W[illegible] are not great killers compared with plagues; but [illegible] vast has been the toll taken by both together that [illegible] audience may well have felt some pride in their f[illegible] bears for surviving at all. They must have reflec[illegible] too, how very different our world—and even we ourse[illegible] —might have been but for sundry epidemics, tim[illegible] and untimely. Thus, when the Moslems set out to conq[illegible] the world, not arms but pestilence kept them at [illegible] Pestilence defeated the Crusaders, thinned populati[illegible] throughout Europe, led to vast massacres of Jews ([illegible] were accused of spreading the Black Death), helped [illegible] lose France for England, made the Emperor Charle[illegible] master of Italy, added to the horrors of the Th[illegible] Years War (which reduced the people to starv[illegible] degraded animals), turned Charles I from the co[illegible] which might have saved him, almost defeated [illegible] French Revolution, broke the power of Napoleon [illegible] Moscow, and gave birth to modern nursing. These [illegible] the main and obvious effects of epidemics; but t[illegible] lead the mind to speculate on its unknown stroke[illegible] to wonder what potential princes, poets, saints, scienti[illegible] tyrants, and dictators it has brought down. No do[illegible] things might have been better, but then they might h[illegible] been so much worse.

EDITORSHIP OF J.A.M.A.

FEW, if any, doctors can be so well known to so ma[illegible] people in so many countries as Dr. Morris Fishbein, edi[illegible] of the *Journal of the American Medical Association* [illegible] the beginning of this month. He joined the journ[illegible] quite temporarily, in 1913 as assistant to Dr. George [illegible] Simmons, and succeeded him in the chair in 1924. [illegible] editor in the dynamic American tradition, doing much [illegible] form as well as to express the policy of his associati[illegible] he has also done much to raise the technical standa[illegible] of medical writing. His production of the *Quarte[illegible] Cumulative Medical Index* is in itself a major contri[illegible] tion to medicine. But at the same time he has ma[illegible] himself one of the chief exponents of medicine to [illegible] American public—through his editorship of *Hyge[illegible]* and through books, lectures, and broadcasts. Many w[illegible] disagree with his opinions have come to feel ab[illegible] Morris Fishbein as Elliott Cutler did when he wro[illegible] "Of his intelligence I was long ago assured, but [illegible] constant turmoil of this recent publication led me [illegible] respect his ideals, his generosity, his patience and [illegible] ability."

Dr. Austin E. Smith, director of the A.M.A.'s di[illegible] sion of therapy and research, has now assumed editor[illegible] responsibility for the journal.

SIR HENRY COHEN, professor of medicine in t[illegible] University of Liverpool, has been appointed preside[illegible] elect of the British Medical Association in succession [illegible] the late Prof. T. P. McMurray.

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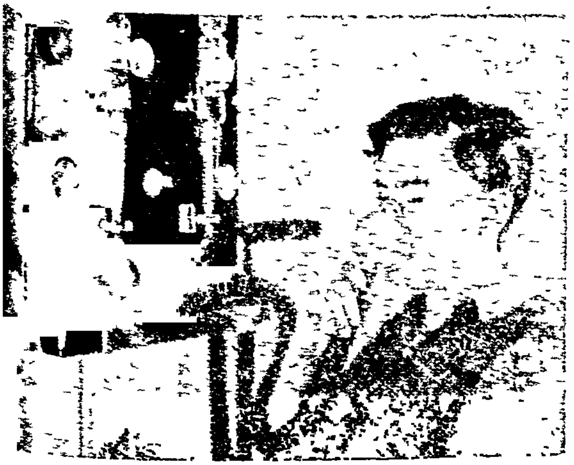
[1] See *Lancet*, 1944, i, 609; 1945, i, 157; 1945, ii, 718; 1947, ii, 403.

[2] F[illegible] Levels in United Kingdom. Cmd. 7842. Pp. 13. 4*d.*

[3] U[illegible] Research Council Recommended Dietary

an antispasmodic action on the nervous system. they are also applied externally and topically by t variety of methods, and much of the equipment nebulisation (vapours), pulverisation (aerosols), douching, gargling, and bathing is so elaborate no patient could doubt its efficacy. Much attention to skin diseases, including acne, allergic reactions, , and eczema; and the filiform douche (a fine water delivered at very high pressure), which is in removing crusts and also in treating acne and was devised at La Bourboule. A salon for treatment has been opened.

adults the chief indications for treatment at this skin diseases, anæmias, catarrhs of the nose and bronchitis and asthma. In a small research nt the effect of treating bronchospasm with the waters in aerosol form is being tested by spiro- and a preliminary report claims that this effect rable with that of the bronchodilator drugs d elsewhere. The most characteristic feature Bourboule, however, is its use by children who for the treatment of catarrhs, bronchitis (non- lous), asthma, anæmia, skin disorders, and debility illness. Children unaccompanied by their parents special pensions or hostels, and have a carefully régime including rest periods and several each afternoon in a large "children's park," which at once a medical centre for physical culture and a lace of happily unregulated amusement on swings and erry-go-rounds or playing around a stream. It is tonishing to see so many children having so much fun t doing so little damage.



Inhaling aerosols at La Bourboule.

A golf-course (at 3900 ft.) can be reached by funicular ay, and the casino has a theatre. The season is from y 15 to Oct. 5.

SAINT-NECTAIRE

Though it has a casino and substantial medical tablishments, Saint-Nectaire is a much smaller, quieter, nd less sophisticated spa than those just described; nd the town itself is old and charming. Lying on the astern side of the Mont-Dore mountains at an altitude of me 2500 ft., it specialises in renal disorders, but also akes cases of anæmia, "lymphatism," and gynæcological omplaints.

The waters, coming from 24 sources at temperatures rom 8 to 56°C are various, some containing more carbonate, others more iron and arsenic. The Granges- ina water is used in renal disease for its diuretic roperties; the patients are given baths and douches; nd special diets (e.g., low in salt or in protein) are provided in the hotels and pensions. A special form of treatment practised at Saint-Nectaire is the hot lumbar douche. During the usual three weeks' treatment at the spa, renal function often shows remarkable improvement, and many patients are glad to return for a course each year. On the other hand it is clear that many of the miscellaneous conditions reaching Saint-Nectaire would improve without treatment, and the cure is justified by experience rather than by statistics.

Saint-Nectaire.

The season is from May 25 to Sept. 25.

VICHY

Vichy, Vicus Calidus, Little Paris, lying beside the River Allier at the very centre of France, 736 ft. above the sea, is a beautiful town, with as many trees as houses. Since the 17th century it has attracted the *beau monde* at home and abroad, and with some 130 consultants and specialists it remains in the first rank of medical and fashionable resorts. The only contra-indications to a cure at Vichy are stated to be neoplastic disease, peptic ulcer in the stage of evolution, and fevers (particularly active tuberculosis).[7] But the conditions for which the waters are deemed specially valuable are disorders of the liver, of the digestive tract, and of nutrition.

The waters, emerging at temperatures from 66°C downwards, are alkaline and sparkling, and have been elaborately studied, first chemically and then physically; but some of the qualities of a thermal water remain elusive, and the physicist gives moral support to the clinicians who claim that the "living" water at the spring is something different from the same water allowed to stand for a quarter of an hour—and a less powerful remedy.

> "A leading London physician . . . once said to me: 'After all, what about your Vichy cure? If I were to tell my patients to rise early, to frolic around Trafalgar Square and now and then to drink half a tumbler of water from the fountain, I am sure I should get the same results as you do.' 'Why not do it?' I answered. 'After all, only results count.'"[8]

Even apart from their more intangible properties, the waters of Vichy, like those of many other spas, have constituents that give them an obvious biochemical or pharmacological action; in excess, they can, for example, induce alkalosis. According to medical Vichy, they specially affect the functions of the liver, stimulating both its internal secretions and the secretion of bile. The patient with cholecystitis, with or without gall-stones, is likely to be helped by their cholagogue and other actions; and every kind of hepatitis, it is said, can benefit provided cell degeneration is not too far advanced; though of course there are conditions whose evolution

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7. Vichy: index medical. Prepared by the Société des Sciences Médicales de Vichy. Vichy, 1935; p. 162.
8. The Waters of Vichy. By the late Gustave Monod, F.R.C.P. Printed privately.

"cardiotonic." Though the water is cool, a sensation of warmth is imparted by the formation of innumerable bubbles which (unlike those of artificially aerated water) cling to the skin.

> "The patient appears clothed in a bathing suit of brilliant pearls; he immediately appreciates a sensation of prickling, or itching and of heat, and, meantime, the skin becomes red. . . . The bursting of the bubbles and their almost immediate reappearance gives rise to a series of recurring sensations of heat and cold, acting much like alternate douches, microscopic and of very high frequency."[2]

The Royat doctors hold that the carbon dioxide causes vasodilatation not only locally, by stimulating the skin, but also generally, via the central nervous system and otherwise, after absorption through the skin into the blood-stream.[3] An alternative method of getting this result is to give the patient a "dry bath" by putting him in a bag containing carbon dioxide, as first proposed in 1875. More recently improvement of the local circulation (e.g., for intermittent claudication and angina pectoris) has been sought by subcutaneous injections of gas from the thermal waters.[4–6]

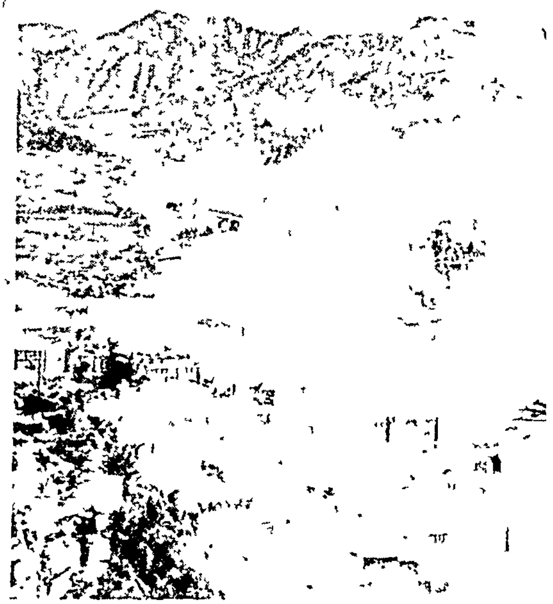
A great deal has been published on all this cardiovascular work, but admittedly some of the explanations are speculative. Much to be commended therefore is the enterprise of Royat, and M. Paulet, its mayor, in establishing an institute where the physiological problems are to be studied, under the direction of Professor Jourdan of Lyons. With equipment which is likely to be excellent, the investigators will be free to do whatever interests them most; but it is hoped that they will combine the clinical and experimental approach and make good use of the large material at their command. Slowly recovering from the difficulties of the war, the spa attracts an increasing number of patients with chronic cardiac and vascular disorders, including hypertension, many of whom are sure that an annual cure makes a big difference to their health and efficiency in the intervening eleven months.

At an altitude of 1480 ft., Royat stands on an outlying slope of the Auvergne, overlooking the semi-industrial city of Clermont-Ferrand and the fertile plain of the Limagne. Though almost contiguous with Clermont, it has a hinterland of fine mountain scenery, including, quite close, the Puy-de-Dome (4806 ft.) surmounted by an observatory and the ruins of a large temple of Mercury. It has an exciting golf-course, a large casino containing a theatre, pleasant gardens, and many hotels, of which at least one is superlatively good. The "season" is from April 15 to Oct. 15.

MONT-DORE

With its 80 hotels and pensions, Mont-Dore (3400 ft.) lies in a wooded valley in the heart of the Auvergne, dominated by the Pic du Sancy (6188 ft.) the highest point in Central France. It was a Roman health resort, with a temple; Jean Banc in 1605 was astonished to find traces of the conquerors of Gaul "en si rude, desplaisant et facheux pais" and marvelled at their pertinacity in searching for hot natural waters in which to bathe. The 17th century saw a revival of the reputation of the waters, and in 1788 de Brieude was writing of their value in every kind of asthma. Today Mont-Dore is widely regarded as the *providence des asthmatiques* and the *capitale de l'asthma*.

Besides its altitude and beautiful situation Mont-Dore has its natural waters, employed in many different ways for respiratory disorders. Coming from eight sources at temperatures of 38–44°C, they contain unus quantities of bicarbonates, iron, arsenic, and sil giving off carbon dioxide and nitrogen. Taken mouth they are believed to regulate nutrition metabolism; applied to the mucosa of the upper resp tory tract, they are astringent and *tonefiant*; in m or in dry vapours (aerosols) they are sedative and mote resolution; and in baths and douches they achi various effects. The Mont-Dore doctors, re asthmatic attacks as manifestations of a diathesis, do devote themselves to local treatment of bronchial spa but aim at modifying, during the three weeks' cure, underlying metabolic disorder. One of the me employed to this end is a decongestive douche ap over the liver.


Mont-Dore from the hills.

The thermal establishment—so large that 2500 patie can be treated at one time—strongly resembles a tem in which a spring occupies the place of an altar. the modern side, the patient's faith is bound to strengthened by the ingenuity of the apparatus used f producing the mists, aerosols, douches, and baths wi which he is treated; and by the declaration that " ne soigne au Mont-Dore que les maladies des vo respiratoires, mais on les soigne parfaitement." The can be no doubt of the great benefit often conferred the combination of so many therapeutic factors.

Mont-Dore too, "centre mondain, artistic, et sporti has its casino, and its charming golf-course A funicul takes one to the plateau du Capuchin and a teleferic to t Sancy. The season for the cure is from May 25 to Sept. but the town is also a winter sports centre, with good ski in March and April.

LA BOURBOULE

In a neighbouring valley lies La Bourboule (2765 ft which in sixty years has enlarged from a little haml into a major spa, treating last year 12,000 patients an entertaining 24,000 summer visitors. Its vogue bega with the discovery of arsenic in the waters (0 00705 g per litre), which are hot (60°C) and exceptionall radioactive. They contain bicarbonates and chloride an have been likened to arsenical and radioactive sea-water

The basis of the cure at La Bourboule is drinking the waters in small and carefully regulated quantities they are supposed to promote hæmopoiesis, reduc hypersensitivity of skin and mucous membranes, ar

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2. Royat: Therapeutic Indications. Prepared by the Société Médicale de Royat, and translated by Dr. Norman Fleming. 4th ed., 1930; p. 62.
3. Petit, A., Mougeot, Aubertot. La cure balnéaire de Royat. 1935.
4. October, 1946.
5. uary, 1917 (communication to the Société c Cardiologie, Dec. 16, 1946); *Vie méd.* October, 1945.
6. Robert-Canque, M. Influence des injections des gaz thermaux de Royat sur les vaisseaux de la rétine. *Thèse de Strasbourg*, July, 1918. *Clermont-Ferrand, 1919.*

Aix douche.

which acts as a lubricant for manipulation, and it is in the natural state for douches and baths. For king, water with a low mineral content from two springs is given to promote diuresis.

r the end of the 18th century the Aix douche had me the chief form of treatment. The general he-massage is given out by two attendants:

> It is not a shower-douche, but a double jet-douche: of the jets is discharged from a large supple tube which of the attendants holds placed on his thigh, and manies by slight displacements of the trunk and lower limbs. keep the hands free to massage beneath the douche. patient is seated on a wooden stool; one of the two tors places himself before the patient and the other d him: the douche-massage is carried out in a symral fashion. The dorsal and lumbar massage is next med, the patient lying flat on an inclined plane. The tion is terminated by a general douche without massage the patient undergoes while standing upright in the r of the cabin. The douche massage lasts ten minutes ses up about 220 gallons of water at a temperature to 104 F.
>
> f it is so desired, the douche-massage may be preceded '*bouillon*,' i.e., a stay for some minutes in a narrow where a copious shower of water at 110 F is made to ontinuously: this shower, when it falls, breaks on the d, forms a dense cloud of thermal vapour, converting hamber into a natural hot vapour bath. The douchege has necessarily to be followed by a rest in bed for an or less during which time the patient perspires freely hen reposes (reaction time).
>
> he Aix douche is an operation of considerable versatility; hysician, in fact, can vary at will (1) the temperature water, (2) its pressure, (3) the terminal douche.'[10]

merly, wrote Pidoux in 1866. Aix distinguished by the brutality of its methods of douching, bathing, sweating; but its practice became discriminative. today, as the principal rheumatic spa of France. ers a wide range of treatment, as well as the fruits g experience. All forms of subacute and chronic natism are variously treated, and apart from the effects of manipulation on the joints and muscles—hing of adhesions; absorption of exudates, rates, and fibrositic deposits; alleviation of pain; ration of muscle—there are said to be useful general s on metabolism, the action of the skin, and other y functions. Apparatus in great variety permits opriate exercise of almost any group of muscles ing special treatment—such treatment being given, e necessary, under water. All this equipment would ost of our own orthopædic departments with envy. e staff of the vast and modern bath establishments elected from the same families in the locality, after a etition which takes place after two years of teaching, ding anatomy, hydrotherapy, and manipulations.'[10] training is controlled by the local medical society. the spa has a vigorous medical life, producing many reports in a journal, *Rhumatologie*. Two international conferences have been held at Aix since the war, the first on "social thermalism" (1947)[11] and the second on chronic degenerative rheumatism (1948).[12] Besides rheumatism and gout, the major indications include neuritis, neuralgias, and the disabilities caused by poliomyelitis and injuries.

At Marlioz, near by, a cold sulphur water is used in various ways (mists, aerosols, &c.) for nasal catarrhs and other upper-respiratory disorders.

Besides the natural beauties of Savoy, Aix offers all the usual holiday attractions—ski-running on the lake, fishing, casino, golf, race-course, and an easy ascent by "the most powerful teleferic railway in the world," to Mont Revard (5083 ft.), with its appropriate sports in winter. The new baths establishment is open only from May to October, but the old one is open all the year. Patients generally spend three to four weeks at Aix, followed by some ten days at a neighbouring mountain resort.

EVIAN

Evian is charmingly situated on the south shore of the Lake of Geneva, sheltered by mountains. The altitude ranges from 1220 to 1950 ft., and its summer warmth is tempered by breezes exchanged between the mountains and the lake.

Its waters are cold, hypotonic, and almost free from chlorine, and they offer a "cure by diuresis."[13] Drunk at the source, they stimulate renal secretion more strongly than ordinary water, and they are said to have a dehydrating effect because considerably more is eliminated than the amount ingested.[14] A carefully regulated cure can be of value in renal insufficiency with retention of chlorine and nitrogen; in renal lithiasis and infections of the urinary tract; and also in suitable cases of hypertension and arteriosclerosis. Other conditions in which good results are claimed include gout, cholæmia, biliary infections, and certain gastro-intestinal disorders—the water having a sedative or antispasmodic action on the intestinal tract.

Evian from the air.

The effects of the waters are supplemented by hydrotherapy and other physical methods in an up-to-date

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rançon, F., Merklen, R. Aix-les-Bains. (Descriptive pamphlet).

11. Premier Congrès International du Thermalisme Social. Rapports. Chambéry, 1947.
12. Deuxième Conference Scientifique Internationale d'Aix-les-Bains: Rapports, Comptes-rendus, et Atlas. Chambéry, 1948.
13. Evian: Hydromineral and Climatic Treatment. Prepared by the Societé Médicale d'Evian, and translated by Dr. Norman Fleming.
14. Laure, M. Azotémies et la cure d'Evian *Thèse de Marseille*, Dec. 9, 1947.

can at best be retarded. The effects of hepatic disorder are so far-reaching that a régime tending to restore normal function can remove apparently remote symptoms; and a great many children—for instance those with cyclical vomiting, dyspepsia, and urticarias—are sent to Vichy: also sufferers from diabetes, gout, obesity, arthritis, and renal disease, and people from abroad whose livers have been damaged by amœbiasis or other tropical diseases. The large establishments make it possible to provide almost any form of physical treatment that may be ordered: for example, there is an astonishing department of mechanotherapy. In the classical *douche de Vichy*, often used in rheumatism, two attendants give general massage to the patient lying under a hot shower, and this is normally followed by a *douche à percussion*. Jets and douches applied locally at different temperatures are designed for various purposes, stimulant and sedative. Lavage of the colon seems to be popular among the clientele, and an ingenious machine, which aims at re-educating a sluggish gut, produces alternation of pressure in the sigmoid colon by rhythmical injection and aspiration of fluid. On the dietetic side, most of the Vichy hotels coöperate by providing patients with one of two special diets, "gastro-hepatic" and "diabetic." For each of these categories there is a list of foods prohibited and foods allowed.

A research laboratory was set up in 1928, working under the control of the Institut d'Hydrologie et de Climatologie of the Collège de France. It has good facilities for work on chemistry and physiology; and in view of the normalising effect of the Vichy cure on disturbances of acid-base equilibrium the investigators there have lately been studying nervous excitability before and after treatment, as measured by chronaxie. Generally, though not always, chronaxie has increased with a change in urinary pH towards alkalosis, and vice-versa.[9] In the careful way that earlier scientific generations ascertained the chemical constitution of the waters, the present investigators are exploring their physicochemical properties. Then comes the harder task of discovering just how these properties affect pathological processes in the body.

The climate of Vichy resembles that of Paris: the season is from April to the end of October, and the spa is fullest when the weather is hottest—in July and August. The civil thermal hospital, founded by Louis XIV in 1696 for indigent people from all parts of France, now has 164 beds and admits about 800 patients between May 15 and Oct. 1.

Covered galleries at Vichy.

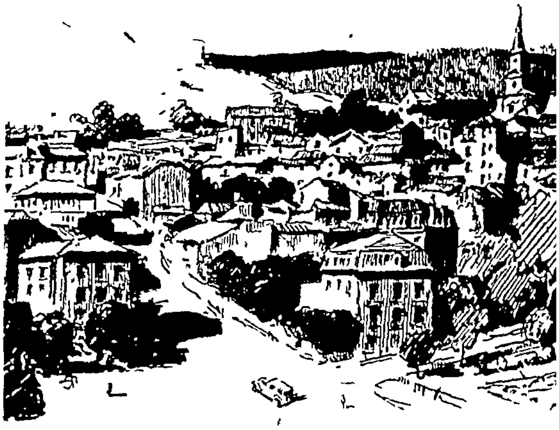
CHATEL-GUYON

About sixty years old, Chatel-Guyon is a rapidly ri spa, which already treats some 15,000 patients a y mainly for gastro-intestinal disorders and colitis. waters, whose consumption is described as the m important part of the cure, are warm (24–38°C) and bes free carbon dioxide and bicarbonates contain an unusu large amount of magnesium chloride (1·85 g. per li Their use is said to stimulate

gastro-intestinal motility, an

is mild. Hence they are re

constipation, whether spasmodic or atonic; for col especially the sequelæ of dysenteries and other trop infections; for digestive troubles in children; hepatic and renal complications of intestinal infect (e.g., "colibacillosis"), and for other miscellane complaints. Methods of treatment practised incl drop-by-drop infusion of fluids per rectum and appl tion of warm mud over the abdomen, which is employed at several other spas. The second-c



Chatel-Guyon.

bathing establishment has this year been enlarg by the addition of some 65 cabins; and the Établis ment des Grands Thermes is now to be complet renovated.

Rigorous régimes are a feature of the medical wo of this spa, and three standard diets are available patients: "Chatel-Guyon is a centre for digesti re-education."

The cure usually lasts 3–6 weeks, and the season is fro May to Oct. 5. Placed at the foot of the Auvergne mounta at 1300 ft., the town has a pleasant climate. There is casino and much to see in the neighbourhood.

AIX-LES-BAINS

Aix is derived from *aquæ*; but the sulphur waters Aix-les-Bains were used medically, it is said, long befo the Romans conquered Gaul and built their lar establishment around the source. In 1600 Henry Navarre, after taking the baths with "pleasure an contentment," decreed that they should be reserved f captains and soldiers wounded in his service. Aix ha a fresh renaissance towards the end of the 18th centur and in 1860 Haute-Savoie was joined to France. The sp acquired and has maintained a great reputatio especially for the treatment of rheumatism.

The clean and pleasant town built around the sourc lies beside the Lac du Bourget (the largest in France) its altitude is only about 900 feet, there is little wind, an the air is mild and dry, but fine mountains rise behin it and across the lake.

About a million gallons of radioactive water, contai ing much calcium sulphate, flows out daily at a tempera ture of 45–46° C; it contains *baregine*, a product o

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[9] Glenard, R., Lescoeur, L., Cuvelier, R. *Bull. Acad. Méd. Paris*, 1947, 131, 612.

HOSPITAL APPOINTMENTS

A SCOTTISH REVIEW AND FORECAST

THE ages of consultants and senior hospital medical ficers have been investigated by the Department of ealth for Scotland; and the Department offers a forecast the probable number of vacancies in the next few years. The information was collected in September, 1949; d the Department's report points out that since then ere have been some deaths, retirements, promotions, d new appointments; moreover, some sixty appeals ainst grading are pending. It is believed, however, at "these and other sources of possible error do not riously invalidates" the conclusion to which the figures em to point.

The report deals with 920 doctors, of whom 646 are aded as consultants and 274 as S.H.M.O.s. These, as e report says, are a comparatively young community, d their year-of-birth period covers almost exactly 40 ars (only 2 consultants were born before 1880 and only S.H.M.O.s after 1919). In this 40-year period the age-stribution of consultants and S.H.M.O.s is as follows: and over, 9%; 59–50, 23%; 49–40, 33%; and under , 35%. The age-distribution of the two groups parately, by 5-year periods, is as follows:

Age, years	*Consultants*	*S.H.M.O.s*	*Total*
70 and over	2	..	2
69–65	20	5	25
64–60	52	6	58
59–55	64	20	84
54–50	99	27	126
49–45	127	44	171
44–40	108	26	134
39–35	138	73	211
34–30	36	70	106
29 and under	..	3	3

Vacancies in the specialist service may arise through ath, retirement, or increase in the number of posts. It is not, of course, practicable to assess precisely the portunities which specialists trained in Scotland may d elsewhere in the United Kingdom, in the Services, abroad. With this reservation, the numbers of specia-ts in training at any one time, that is the numbers registrar appointments, should be related to the ospective vacancies."

> "There cannot at present be any certainty as to the number new specialist posts that may be created in the next few ars. The more obvious gaps—in the landward areas and in tain specialities—are being filled now and further expansion the hospital services cannot proceed far in advance of pansion of the hospital and outpatient facilities and in the mbers of nursing and other ancillary staff. These may ove limiting factors. It is safer, therefore, to confine examination for the present to the numbers required to maintain existing specialist establishment."

The normal retiral age is 65, though boards may tend contracts, perhaps with modification, up to the e of 70. Thus specialists born in 1885 or earlier should rmally retire in 1950; and these number 34 (consultants 28, S.H.M.O.s 6). In subsequent years the estimated mbers of "normal" retirals are: 1951, 7 (6 consultants, 1 S.H.M.O.); 1952, 13 (all consultants); 1953, 20 consultants, 3 S.H.M.O.s); 1954, 11 (10 consultants, S.H.M.O.); 1955, 16 (12 consultants, 4 S.H.M.O.s); 56, 16 (13 consultants, 3 S.H.M.O.s). Possibly not all ese retirals would be followed by individual replacements; some "representing posts, on part-time ntracts, with a limited number of sessions, might not. me S.H.M.O.s will, no doubt, be replaced by conltants." In addition there will be about 10 death cancies per annum, though, owing to the age-distribuon, the number may be fewer for the next few years.

"These calculations suggest that an output of trained gistrars of not more than 30 per annum would adeuately fill the prospective vacancies for some years to me over the whole specialist field.

> "The number of registrars in each grade, junior registrar, gistrar, and senior registrar, will, no doubt, be progressively duced so as to select from the initial entrants to the registrar grade only those capable of filling specialist posts. This qualitative selection should presumably be accompanied by a quantitative reduction so that the numbers emerging as trained specialists roughly approximate to the prospective vacancies—in Scotland and elsewhere. The proper rate of reduction at each of the several years of the registrar's training is a matter for consideration. The number of senior registrars in each year of training should presumably be related closely to the annual expectation of specialist vacancies. The number of registrars in each year has to be greater than the number of seniors and the number of junior registrars greater than the number of registrars. For example, one estimate is that for every 30 specialist posts that fall vacant each year the appropriate numbers of registrars in training might be:
>
> | | | |
> |---|---|---|
> | Senior registrars: | (? Fourth year | 30) |
> | | Third year | 30 |
> | | Second year | 30 |
> | | First year | 30 |
> | Registrars: | Second year | 40 |
> | | First year | 60 |
> | Junior registrars | | 90 |
> | *Total no. of registrars* | | *280 (+ ?30)* |
>
> If the process of selection is more severe the numbers in the earlier years might be greater, and conversely."

Taking 30 as the annual number of vacancies in existing posts in Scotland for the next few years, the necessary number of registrars in training to fill these posts is about 300. "Allowance has to be made, of course, for new posts and other needs outside Scotland, but even so, it seems necessary to consider whether the numbers of registrars and others at present in training to be specialists are justified by their prospects of obtaining specialist posts."

The report ends with this warning:

> "It is also necessary to consider the needs of the hospitals for medical staff below the specialist level in order to carry on the essential work. There may prove to be a substantial difference between the number of registrars which the prospect of specialist posts would warrant and the number of doctors of this level of experience who are actually needed in posts the bulk of which have in the past been filled by specialists in training. A situation of this kind might well require some reconsideration of the basis of hospital staffing, the relative responsibilities of specialists and registrars and the scope for hospital posts outside these two categories."

AGE OF GENERAL PRACTITIONERS

The Department has also issued the following figures for the age-distribution of general practitioners of known age in Scotland:

Age, years	*Principals* %	*Assistants* %	*Age, years*	*Principals* %	*Assistants* %
Over 80	0·2	..	40–49	26 0	6·0
70–79	3 6	0·76	30–39	29·6	35·4
60–69	9 2	0·76	20–29	6·7	55·2
50–59	24·6	1·52			

FUTURE REPORTS

Further studies now in progress include an estimate of the distribution, by age-group and locality, of general practitioners; and further tables will show the number of new medical practitioners and medical students who register for the first time in each year in Scotland and England and Wales. Later, all registrar appointments are to be analysed. Finally, the tables will be kept up to date by quarterly returns from the boards showing deaths, retirements, transfers, and new appointments.

The Department remarks that its analysis of specialist posts is still incomplete, but "the preliminary results have appeared so deserving of urgent consideration" that they are published without delay, for the information of regional boards, the universities, and the profession.

An analysis of registrar posts is urgently needed to complete the picture for Scotland; and it may be hoped that the Ministry of Health will soon be in a position to announce the figures for both specialists and registrars in England and Wales. The necessity for providing such information, particularly for specialists in training, has long been apparent; and on this first report from Scotland the trainees may judge that their darkest surmises are confirmed.

thermal establishment; or, when suitable, by bathing and sun baths at the attractive plage. Diet "is given every possible attention by the hotel-keepers."

Though most of the spas described export their waters, those of Vichy (Celestins), and Evian have probably the largest circulation. The subterranean torrent of the Cachat spring at Evian is piped and bottled in immense quantities, supplying some of the benefits of the spa to patients at home. No longer a "live" water, and less stimulating to the kidney, it can be taken more freely. Despite the large flow from this spring, the mineral content of the waters is virtually the same as it was when accurate analysis was first performed some sixty years ago.

The environment of Evian, however, cannot be bottled. It is both a hydromineral and a climatic station, and despite its physical-culture stadium, sports grounds, golf, great hotels, and elaborate casino, it is a restful place. Short journeys by water or by road bring one to others still more beautiful.

The Spa and the Social Revolution

The spas of France, as of other countries, have been developed as resorts for the wealthy. They have their hospitals for the poor, and their establishments for the people of modest means; but their main support in the old days was from the well-to-do, for whom fine hotels were built and every kind of entertainment was provided. Since the war much of the foreign clientele has been excluded by currency restrictions; and though we may hope eventually to see this particular obstacle removed, the continuance of high taxation in most countries makes it unlikely that the health resorts will regain their old fashionable glory.

Adaptation to the post-war social revolution cannot be easy. The temptation for any spa which is already a pleasure resort is to concentrate on its material attractions—its beautiful situation, its amusements, and its luxurious hotels. It can easily transfer its appeal from curists to tourists. Alternatively, however, it can become austere, returning to the old tradition of the place of medical retreat, where all and sundry can find simple accommodation and the best of medical care. Facing this choice, official French policy seems to be a compromise, with the balance rather tilted towards the medical side.

Opening the congress on *Thermalisme Social* at Aix in 1947, the minister of health said:

> "We have too long lost sight of the true character of a thermal cure. . . . A small error of vision has developed: our big stations have become much better known for their casinos than for their curative establishments, for their palaces than for their hospitals. . . . We must frankly review the problem from the right aspect—regarding the thermal towns as a natural resource which we can use for the benefit of people whose suffering we ought to relieve."[15]

The director-general of the Sécurité Sociale was cautious but also definite:

> "A spa is not and should not be preoccupied too much with tourists and holiday-makers. Its purpose is not to provide a tired worker with a holiday on sick-pay: its purpose is to look after him and to treat him. Certainly the importance of the tourist problem should not be underestimated, especially the problem of the tourist with limited means; and the spa, in so far as it is also a holiday resort, may have a part to play here. But the problem of the spa proper is, and must remain, purely medical. Only medical factors can be taken into account when making decisions on these matters. Indeed we might even go further and consider whether tourists who are not taking the cure, or who are not taking it on medical advice, should not be excluded from the spa to make room for those who are in real need of treatment. To put it differently, if in future our spas are to be organised on a democratic basis worthy of the name, logically we ought to give absolute priority over tourists to patients recognised to be in need of a thermal cure."[16]

Speaking of the growing aspiration that everyone should become equal before Medicine, he argued that spa treatment should no longer be the privilege of limited section of the community. The tendency i many countries towards equalisation of incomes dai reduces the number of individuals and families who ca face the expense of a thermal cure, and according arrangements have been made to help them.

> "One of the essential characteristics of thermal trea ment, which distinguishes it from all other forms of therap is that the cost of treatment proper represents only a fracti of all the expenses entailed. The heaviest expenses a often fares and board and lodging. This necessitates putti into operation methods of administration which are n needed to the same extent for other forms of therapy. T social-security organisations have had to enter into agre ment with the hotel-owners at the spas as well as with t doctors. They have had to introduce ways of reimbursi patients with fares. They have been obliged to set up speci administrative machinery."[17]

Very broadly speaking, the French system of soci security allows every patient to recover from the region funds about 80% of the fees paid to his doctor, and t charges for ordinary medicines; and the same princip has been applied to the spas. Patients approved for cure can reclaim their third-class fare, 80% of the co of three weeks' treatment, and 4000–5000 francs (varyi at different spas) for their lodging. The result of the measures is that the spas have revived remarkably sin the war; their pensions and their hostels for childr are well occupied during the season, even if the gre hotels are not; and at some of them there is *beaucoup* *monde* though less of it is the *beau monde* of the old day

Believing strongly in the health resort and the cur France has gone far to ensure that their benefits shall enjoyed by all who need them—according to their sta of health rather than the state of their finances. "F the idea of the patient as an individual dependent on h own resources, social security substitutes the idea of collective guarantee against illness and its cons quences."[18] And the spas have thereby been given new lif

But even in these difficult times the French are n thinking in purely national terms; they have n forgotten that their spas formerly drew health-seeke from half the world, and they believe that if the vario national health services were coordinated this cou usefully happen again.

> "Popular spas have always been visited by families fro many foreign countries. Today we must stress their inte national character—not only for families in easy circumstanc who can afford a journey abroad, which is often very expens but also for the whole of the population whatever the income group. Every country should make a list of t treatments offered at its spas, and where a disease can treated most efficaciously at a foreign spa patients should enabled to visit that spa to take advantage of the faciliti offered there. To begin with, these international exchang will no doubt give rise to difficulties, and will only have limited application. But the principle should be establishe At present we send patients abroad for serious operatio which cannot be carried out in their own countries; in t same way we must arrange for patients to be sent abroad f thermal treatment which offers them their only chance cure or relief. Though at present these patients may be fe there will probably be more and more of them in the future."

In the discussions between the governments of Weste Union the possibilities of such arrangements have alread been canvassed.

Meanwhile many thousands of English people hav been experiencing the refreshment of spirit that com of visiting their nearest neighbours abroad. More an more of us have come to feel the truth of the saying th everyone has two countries—his own and France. An whatever our opinions on spa treatment, more and mo of us have found reason to believe in the corrective an therapeutic effect of a visit to our second country.

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15. *Op. cit.* (ref. 11) p.8.
16. *Ibid*, p. 13.
17. *Ibid*, p. 15.
18. *Ibid*, p. 120.
19. *Ibid*, p. 16.

e phisitians are covetous, ignorant, impudent & runken, & for by that means he ruines himself and his rofession.

The universities have a great share in all these ill ayes by theire first bringing up & binding their yong udents. For they have lost the old & sound Aristoteles arning & spend all their time in ye new fangled fopperies [Cartes, Gassendi, Boyle, Hobbes, [? Regius] &c.

If ye phisitian dine abroad, misse his houres usualle orning, noones, & nights, or rather all the whole day ith slavish attendance, he then certainly looses his patient at brings ye [? aches] & becoms reproached [thereby]: sent for, & comes not presently, another comes & he neglected ever after of ye family & all their relations ith scandall of neglect. If ye phisitian venture his life pon attendance on his owne acquaintance in the dredfull me of ye plage, in the conclusion they rewarde him, with ying, he did his duity, as they served me in this Citty f London, where I got nothing soe much as the fugitive hisitians, but the King's gratious thanks for attending is soldiers in St. Thomas' Hospitall all ye time 1665.

The phisitian old & crasy shall be called out of his bedd London in winter nights to visit his patient & wth. mall reward, but in sum̄er or winter, when that patient omes to London & is sick he shall undeservedly call nother phisitian to his attendance & neglect the former t. attended in ye winter nights in ye country.

Then I considered in yt. letter how ye Divinity had n it far greater hopes & opportunities of preferment a better settled way of perpetuity & continuance of upportance for yonger Students by being Chaplains. icears, Curates, through all England, to wch. they did uickly attaine, but phisick was a tedious, long, & hargeable study, & 10 or 12 yeares at least after all ime & charge of taking a Dr. of Phisick's degree, before ny Dr. could hope to live by the benefitt of his profession. I then alsoe consider the com̄on and civill lawes. rch. farr exceede physick in certainty both of honour nd riches, to the carefull & industrious Students of them.

Mr. Church Dat: 2.72. to my last letter returned yt. e still continued his intentions for yr. son for phisick thereby to endeavour his maintenance by country ractice. I returned answer by letter dat: Novb. 2. 672 that what I had writt last to him was absolutely rom my [? sence] of ye finall decay of ye profession of hisick: but he continued soe still resolved. I would fford yr. son ye best entertainmt. I then could for dyet lodging for 3 or 4 months, that he might have opportunity in London to see our constant practice in our Hospitalls, both of phisick & surgery, & to be acquainted ith ye Apothecares [? books] & medicines, their gardens f phisicall plenty, & wth. the most materiall books for ractise of both. But now the improvement must wholly rise from himselfe, as he finds occasion by his owne ractise, & thereupon carefully reading & extracting constantly & exactly noting for his private use & emory what he shall read upon every disease, & thereby earne a readines to comprehende & put any case to any lder phisitians to obtaine his counsell & experience upon e care of his case.

Now this practise if industriously followed will really ring him into the right way & method of the practise f the art of phisick. And this way I was. And this ay of study & improvement of himselfe, by his owne dustry. I am now informing, suggesting & insinuating pon yre. son's capacity. For after he fully understands this course of study & practize mentioned, he must apply himself into ye country & im̄ediately put himselfe into dayly practice & exercise & curing poore patients. For reading alone, is good for just nothing, wth.out the constant association of practise & bringing all he reades to the use & profitt of the sicke by his owne contrivement, judgement, industry, & constant diligence, ever altering framing & suiting his medicins proper to the present case. Soe practise without constant Study, reading & examining what hath been done on like occasions by able renowned & famous old practizers of phisick wil be successles [;] but both judiciously joined together may produce an happy practice both to ye phisitian & patients, by God's constant blessing thereupon, wch. shal be hartily desired by

Yre. reall friend & servant

TH: WHARTON.

May 15: 1673.

Points of View

ARMY MEDICINE IN THE LATE WAR

SOME MISTAKES OF POLICY ?

JOHN W. TODD
M.D. Lond., M.R.C.P.
ASSISTANT PHYSICIAN TO FARNHAM HOSPITAL; LATE LIEUT.-COLONEL, R.A.M.C., OFFICER IN CHARGE OF MEDICAL DIVISION

(Continued from p. 1148)

3. Abuse of Hospitalisation *

THE reasons for admitting a soldier to hospital are: (1) he is acutely ill, bodily or psychologically; (2) he has chronic complaints and needs investigating; or (3) he has chronic complaints and it is necessary to dispose of him. There is, of course, some overlapping between groups; but most cases fall clearly into one or other.

Soldiers in the second and third groups were commonly given treatment; but, leaving aside those with such chronic "surgical" lesions as herniæ, which could be radically cured by surgery, they were not, or should not have been, admitted for the main idea of having treatment, unless they were also to be invalided from the Army. Treatment given for chronic "medical" conditions is virtually never really curative: and such remedies as insulin, liver extract, and thyroid, which when given continuously are almost as valuable as cures, had little relevance to the Army, since those affected by the diseases they relieve were almost all invalided. Even treatment for such a common recurrent condition as peptic ulcer was only very rarely followed by a man's returning to duty: in the case of soldiers a regulation expressly made invaliding compulsory, and among officers very few were retained in the Service after they had been proved to have peptic ulcer, unless perhaps they were Regulars.

THE ACUTELY SICK

Apart from malaria, and in certain situations venereal diseases, there were few regulations which implicitly or directly made hospitalisation compulsory for those affected by some specific acute disorder. It was assumed by the authorities, just as it is assumed in civil life, that the regimental M.O. or other doctor who first saw the patient should use his discretion as to whether to deal with him on the spot or evacuate him. It is therefore difficult to estimate how far acutely sick soldiers were unnecessarily hospitalised. Doubtless a high proportion of the wounded and the acute psychiatric casualties in battle were rightly taken to hospital. But it was my impression that too many of those with acute trivial illnesses were admitted. Regimental M.O.s and others in similar situations were rarely if ever *encouraged* to treat their own sick until they had recovered. Directives, suggestions, and propaganda tended to encourage the opposite attitude. And, whereas one sometimes heard of a regimental M.O. getting into trouble from his A.D.M.S. for retaining the sick too long, one did not hear of him being praised for looking after his own men in preference to sending them to hospital.

But certain regulations, besides those concerning malaria and amœbiasis, urged or compelled medical officers to retain men in hospital with certain acute conditions for fixed minimum periods. For example, an ALFSEA order said that soldiers who had had appendicectomies *must* remain off duty for at least a month. This order did not differentiate between the various categories of soldiers. It followed, therefore, that a clerk

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* The word "hospital" is here used as a generic name for all Army medical units behind the regimental aid-post.

THE KING'S FUND

STAFF COLLEGE FOR HOSPITAL ADMINISTRATORS

PRESIDING at a meeting of King Edward's Hospital Fund for London on Dec. 14, H.R.H. the Duke of GLOUCESTER said that the main purpose of the meeting was not, as formerly, to approve the list of grants for the year; it was rather to look forward and to take stock of the Fund's commitments. The management committee asked approval of three main groups of activities. First, they proposed that £100,000 be again placed at the disposal of the distribution committee for grants to hospitals. (Last June £250,000 was allocated for homes for aged sick associated with the hospitals, and this scheme was making good progress, but a full report would be deferred until the next meeting.) Secondly, they asked for £80,000 for the convalescent homes committee: "a new spirit is abroad among the convalescent homes which is largely due to the encouragement we have been able to give to many little homes which had become somewhat isolated." Thirdly, there were various miscellaneous activities and projects, including some which were well rooted before the recent changes (e.g., nursing recruitment and the emergency Bed Service), and other newer ones, such as the division of hospital facilities, the staff college for ward sisters, the training school for medical records officers at the Middlesex Hospital, and the projected training centre for hospital caterers at St. Pancras Hospital. The most important new departure was the establishment of a staff college for hospital administrators.

"Today, as a result of the new Act merging two separate administrative traditions and adding something of its own, there is evidence of a widespread need for practical help, and many believe that hospital administration, as understood in this country, is at the crossroads. Nobody, the Minister least of all, wants a bureaucratic hospital service; and if that is to be avoided, an active policy must be pursued aiming at flexibility and initiative. We believe that the foundation of a residential staff college where the different interests can come together may prove a decisive event. We want the hospital administrators of tomorrow *not only to be efficient but to work out for themselves how* to let the humanity which is the essence of the hospital shine through and illumine the administrative detail. We are therefore taking counsel with others interested, and notably with the Institute of Hospital Administrators, as to how best to achieve this result. We have acquired premises; we have appointed a small committee of which the Rt. Hon. Malcolm McCorquodale, M.P., is acting as chairman, and the members of which will be Sir Wilson Jameson, Mr. Fred Messer, M.P., Captain Brierley of the London Hospital, and Mr. Lees Read of Guy's Hospital, who is the president for the time being of the Institute of Hospital Administrators. We have been fortunate in persuading Mr. Constable, the present house-governor of St. George's Hospital, to resign his hospital appointment and become the first head of the new college. Some months must yet elapse before the college can be opened, but we anticipate that when we meet here in the summer it will be possible to name a definite date."

Sir WILSON JAMESON, chief medical officer of the Ministry of Health, said:

"The hospital part of the National Health Service is administered *in typical British fashion by committees*—committees of men and women who, at no small cost to themselves, give generously of their time to voluntary service. But a large modern hospital—still less a group of hospitals—cannot depend for its day-to-day management upon a committee however willing and competent its members may be. Just as a business must have a managing director so must a hospital have a chief administrator —and hospitals now constitute one of the largest, most complicated and costly enterprises in this country.

"In the Metropolitan regions there are more than 120 hospital management committees, each with a chief administrative officer; and there are in addition several hundred senior officers in charge of unit hospitals. Though hospital management calls for *special* inborn qualities of mind and spirit, much can be done to develop and strengthen these qualities by an enlightened *system of training*. In some countries training in hospital administration is provided by universities, but in England such provision on any scale is most unlikely, though in the teaching of the subject some of the methods of university instruction might well be u So here is a real need that the Fund can meet. The prop is to provide a college of hospital administration—in residential for students, in part a centre for the excha of ideas between existing administrators, members boards and management committees, doctors, nurses, others connected with hospital work. Wisely conduc such an institution will do much to raise the standard hospital administration in this country."

Sir EDWARD PEACOCK, treasurer, reported that Fund's total estimated income was £644,000, of wh £253,000 was ordinary revenue (mainly from inve ments) and the balance from the Nuffield Trust for Special Areas, and from legacies. The estimated exp diture for the year had been increased by the spec allocation of £250,000 for homes for the aged sick. T involved the spending of all but £47,000 of the yea receipts, an unusual procedure which it was not propos to follow in subsequent years as it was customary transfer large legacies to reserve. Sir ERNEST POOL chairman of the management committee, present estimates for the year.

THE PROFESSION IN DECAY

A WARNING TO ENTRANTS

A letter from THOMAS WHARTON, F.R.C.P., *to* Mrs. CHURC *dated May* 15, 1673.*

To yre. desired answer . . .—I shall returne you direct *the same I did to Mr. Chancēler Burnell to* his lett dated Nov. 4, 1672, wherein he desired my care a directions in the placing yre. son James, yt. [that] might have an insight of both chirurgery and anatom

. . . I writt to this purpose, that at present I had a yon student with me, yt. had bene 6 or 7 yeares at Oxfor of very good parts and naturall abilities, & graduat & had taught my son these 3 yeares, now *fitt for* university, that this yonge student had acquired exce lently in phisick, anatomy, surgery, botany, &c: y for all that I designed to disuade him from the embraci phisick for his livelihood; because now there was mo *apparent cause of its ruine & destruction* than ever; b the swarmes of quackes, mountebācks, chymists, Apoth cares, surgions, & especially this new upturned *brood* Vertuosis, who are most likely by their Jesuitisme policy, English-books, experiments, & receipts in phisick to fill all the familes of Note in England with their stuf to overthrow all our old settled & approved practice phisick *especially in London*: which is now miserabl impoverished by its burning & building & desertion trade, that they have scarce money for theire presen subsistance, little for phisick & phisitians & like to hav less hereafter. Soe that every one out of necessity *an* good husbandry must become theire owne phisitians make theire owne phisicke. For all our ladies & gentle women kepe & *store up receipt* books & closetts medicins fitted for most occasions.

Besides, *Phisick* is too much overstocked with Student graduated from ye University. For I do realy believe i will easily appear that now there is in *England 400* fo one phisitian that was formerly: for yt. it is impossibl but yt. theire owne multitude must shortly ruine *the* profession, without the plotts and envy of theire enemies.

He yt. begins ye practice of phisick, must resolve to be a perpetuall slave & servant *to ye meanest* & basest, all the dayes of his life, & if [he] neglect one instant, & comitt one error, or speake ye leaste word *amisse*, his fame & name is lost for ever to him & if his patient dye, hath killed him for certain, by ye view of ye *people*. *Upon ye Phisitian* is imposed taxes, poles, great charges for houses & servants & entertainments, more in this *age* than ever formerly! *Coaches*, [? Jacks] & charges expected, feastings. He is never called to any but miserable patients, where the *Apothecary, or* Surgeon or Chymist have bene tampering soe yt. cōmonly the phisitian is brought onely to take away *the scandall* of killing him to himself. The phisitian is made that cōm on jeare of the hunt, neglected *cōtemned & reproached* upon all *occasions : and* wch. is worst they will one reproach & scandalize another for his ill practize: wch. is very certaine & evident *to all* practizers. For generally were clearly there. not for their health's sake. because their units wished to be rid of them. were affected by organic defects. such as chronic bitis. splenomegaly, or flat-feet, but the reason for uselessness as soldiers was nearly always to be sought their psychological state. We were not allowed to them out. and all we could do was to recommend r discharge from the Army and keep them until a pital train took them to Secunderabad. which at time was their next port of call.

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* *Reproduced by permission from a MS. letter book in the library of the Royal College of Physicians of London.*

When a soldier finally received his medical board in ntral India, if merely lowered in category. he was harged from hospital and sent to the base reinforcent depot at Deolali. whence he would later be posted a unit considered suitable for him. But a British dier, recommended for invaliding to the United ngdom, was transferred to a hospital at Poona. ere he later had a review board. Only on confirmation the previous board's decision could he be sent to a by transit camp, to await the arrival of a ship to e him home.

Here, then, is the extreme example of the abuse of pitalisation in the Army. The damage done to rale by retaining men with chronic complaints in spital for such long periods is incalculable: and if eir military value at the beginning of their long rney was small it was much less at the end. The in reason for this state of affairs was that the disposal soldiers was made a *medical* matter. Besides the dical evacuation machine for the acutely sick and nded, there should have been a second machine for ting rid of soldiers found unsatisfactory.

ADDITIONAL REASONS FOR PROLONGING HOSPITALISATION

In civil life the great majority of hospital patients ve a strong desire to be discharged as soon as possible. is not so in the forward units of a war-time army. e military hospital's patients may come from condins of great danger and discomfort in the Burma jungle, which their discharge from hospital means a return. d however long a soldier remains in hospital he does t lose money. Even the best type of soldier, therefore, uld seldom strive to get himself discharged. The dical officer, too, when contemplating discharging diers to duty. might easily be influenced by the cking conditions to which they were returning.

There were also some less creditable reasons for longing the stay in hospital. One was the practice employing patients there. Such men were not as a e fighting soldiers but technicians or followers. In rma, sweepers, who were always scarce, were perhaps st apt to be retained and employed in this manner, en for months at a time. Other categories who were ilarly treated were cooks, clerks, and soldiers with skilled trade such as painting. metal-working, or pentry. For example. while I was stationed in a pital in Bengal early in 1945. a Madrassi came to office and asked to be discharged; he had been mitted three months previously and had spent almost whole time cooking in the sisters' mess. The reason his request was that his friend. who had been cooking the officers' mess for a similar period. had just been charged.

FATE OF THE SOLDIER AFTER DISCHARGE FROM HOSPITAL

In England or in base areas abroad the soldier who s admitted to hospital usually travelled only a short tance. And on discharge he immediately returned his own unit (unless the "Y list" procedure was in eration, when, if in hospital for longer than a specified riod, he returned to his depot to await posting). In rma, however, the soldier who was evacuated beyond field-ambulance level—and only the most trivial cases were not so evacuated—often travelled a long way to a casualty clearing station or malaria forward treatment unit, frequently by air. Even if he was retained in one of these units for only a few days. he might on discharge be some hundreds of miles from his own unit, especially during the mobile phases of the campaign. His usual destination was then the nearest transit camp, where he waited for an aeroplane or truck to take him forward. I have been unable to discover any statistics relating to the average time between discharge from a forward medical unit and the arrival back at the Front. Presumably this figure varied enormously according to local circumstances and in different periods of the campaign. At times it was a matter of weeks or months.

Soldiers who were evacuated as far as the advanced base hospitals of ALFSEA or the base hospitals of India Command were, on discharge, commonly sent to a convalescent depot. For a time there was an order in Central Command in India insisting that *every* soldier originating from ALFSEA should be so disposed of. For a front-line infantryman who had been severely wounded or had had such a febrile illness as typhus fever this was no doubt desirable. But it seemed absurd that clerks. drivers. sweepers, and nursing orderlies should go to convalescent depots and there indulge in activities far more strenuous than those performed when on duty. Here is an example of the common Army error of assuming (in orders) that all soldiers are equivalent. The lives led by parachutists and Pay Corps clerks. by commandos and sweepers in base depots, or by infantry of the line and medical officers in hospitals differ so widely that few orders can suitably apply to them all.

There seem to be no statistics as to the average time spent in convalescent depots in India and Burma. But it appeared that in many depots this time was very long. One commonly heard of men kept there for weeks after quite trivial illnesses.

Men originating in ALFSEA, when finally discharged to duty in India Command, were ordered to be sent to their depots. When I was at a hospital near Madras in 1944 many of our patients had to go to the Punjab. in which their depots lay. To get them on to a train might take a week or more, and about another week would be spent on the journey. However short a time they were kept in their depots, there was inevitably a long period before they finally arrived back in a forward unit. And at that time a high proportion of our patients had not been seriously ill, many only having had malaria.

British soldiers who had been recommended evacuation to England, and had finally had their review medical boards in a hospital at Poona, waited at a transit camp for a ship. But this ship might be many months in arriving, apparently because of the refusal of sea-captains to accept as passengers men who were nominally invalids. When the voyage was over the men would have their final board; and, according to whether invaliding or recategorisation was decided on, would return to civil life or to their homes or depots to await a posting.

The total period between a soldier's evacuation from the Front by his regimental M.O. and his final board in England was often very long.

I once saw a corporal who had spent two whole years in the process, starting in the Western Desert of Egypt and moving slowly via Durban. where he spent a year. As his disorder was congenital cystic disease of the lung, he could hardly be helped by being in hospital.

On another occasion I saw a warrant officer class I who was awaiting a posting in his depot and had already been 13 months off duty. He was a chronic bronchitic who, because of a small hæmoptysis, had been originally admitted in a base depot who had had an interval appendicectomy—and, in accordance with modern teaching, was out of bed the day afterwards and taking vigorous exercise within a week—was not allowed, for a whole month, to return to his duties of sitting in a chair. ALFSEA regulations concerning infective hepatitis, if not actually fixing minimum periods in hospital, gave the impression that even the mildest cases should remain casualties for many weeks.

Quite apart from these actual regulations, there seemed to be a widespread tendency to retain men with acute illnesses too long in hospital. And in my experience the C.O. of a hospital or the A.D.M.S. or D.D.M.S. very seldom made serious attempts to prevent this happening. There might be trouble, on the other hand, if someone in authority concluded that a single soldier had been discharged from hospital too soon. A long ALFSEA order issued to all medical units told the story of a Gurkha soldier with an eye affection who had been sent back to his unit without proper treatment. The responsible medical officer's behaviour was strongly condemned, the evident reason for the circulation of the order being to discourage others from committing a similar offence. But thousands of soldiers could be kept in hospital too long without causing anyone to receive the mildest reproof.

ADMISSION FOR INVESTIGATION

Elsewhere I have advanced the opinion that, in general, admission to hospital as a means of investigation is a mistake, both because of its futility and because of its tendency to worsen anxiety and encourage invalidism (Todd 1949). Others have put forward a similar view. Conybeare (1943), in reference to Service patients says:

> "Most psychiatric conditions present symptoms of a physical kind. Only too often are such patients referred to hospital where the most searching investigations—X rays, test meals, blood examinations, chemical and metabolic investigations, electrocardiograms, even gastroscopy—are carried out in a ruthless determination to exclude any possibility of physical disease. Such a régime carried out in hospital, often over many days or even weeks, only too often permanently shakes the confidence of the patient. Nor does this criticism only hold good with psychiatric conditions. It applies equally to personnel referred unnecessarily to hospital for the so-called investigation of a cardiac murmur, albuminuria, dyspepsia and other conditions. . . . Almost all necessary investigations can be carried out adequately in an out-patient department and the hospitalisation of personnel where hospital treatment is not essential can do nothing but harm."

Yet in the late war vast numbers of chronically complaining soldiers were hospitalised for investigation. Perhaps the largest category, at least among troops stationed in England, were those with the predominant complaint of dyspepsia. In some military hospitals, and especially in the Service wards of E.M.S. hospitals, might be seen rows and rows of dyspeptic soldiers. The essential basis of the symptoms of the majority was clearly to be sought in their state of mind—typically they complained of being unable to stomach the "greasy" Army food. Other large categories were those with the cardiac symptoms of emotional origin being investigated to "exclude" organic heart-disease, the chronic bronchitics, (especially if they had brought up a faint trace of blood, when they might have bronchoscopy and bronchography performed), those alleged to have had fits, and the enuretics.

This superfluous hospitalisation could rarely be blamed wholly on the official regulations, as in the case of malaria. Nevertheless, many regulations, by urging investigations in special circumstances or by insisting that those with certain complaints should be referred to a specialist, encouraged hospitalisation, and few had the opposite tendency. Many of the boarding regulations had a similar effect. For example, it was laid d that those with bronchiectasis should be invali Medical boards, therefore, often insisted on a bronchog in suspect bronchiectasis cases; and there is a com belief that bronchography should be done only inpatients.

What I have said so far applies mainly to tro stationed in England or in base areas abroad. In forward areas, by reason of distance, soldiers co hardly be sent as ordinary outpatients to a milit hospital, and it may be doubted whether the regimen M.O. often wished to send them. If a soldier's sympto did not seem severe and he was a useful member of unit, any investigation could be postponed until unit was withdrawn from the fighting line. On other hand, if he attended the sick-parade so much to be a nuisance, or if in other ways he was unsatisfact as a soldier, the regimental M.O.—either on his o initiative or at the suggestion or urging of a combat officer—would probably evacuate him through medi channels so as to be rid of him. In the forward are therefore, the reasons for hospitalising a soldier we first, because he was acutely ill, and, second, becau he had chronic complaints and it was necessary to disp of him.

ADMISSION FOR DISPOSAL

In England there was no need to admit soldiers f the purposes of disposal. Indeed, the machinery f recategorising or invaliding them from the Army, wha ever may be thought of its theoretical basis, w remarkably quick and efficient. A regimental M.O. cou send a soldier to see a specialist as an outpatient o day, and if the specialist recommended discharge fro the Service the soldier could attend a medical board day or two later, and with the board's confirmation provided with a civilian suit and a railway ticket his home the following day. On the other hand, if th specialist merely recommended lowering in categor and this was confirmed by the board, he could retur to his old unit and continue with his duties until poste to another unit of a type thought appropriate fo him.

Even abroad, in base areas the mere recategorisatio of a soldier did not necessitate his admission to hospital and this could be effected in much the same way as i England. But in the forward areas the situation differed There, if a man committed some serious crime he migh be got rid of through non-medical channels. Otherwis it seemed virtually impossible to dispose of a soldie except as a casualty. Requests to higher authorit that he be posted usually fell on deaf ears, and the fact of his being useless was no official ground fo getting rid of him.

In the Burma campaign medical boarding was forbidden even in such base areas as Chittagong and Comilla, which were hundreds or thousands of miles from the fighting, and could only be carried out back in India proper. And when a soldier reached a hospital in, say, Comilla, he might already have been in the evacuation machine for several weeks. He would there wait for an ambulance train to take him to Calcutta or further. Since there was an order that ambulance trains had to be full, so as not to "waste" transport, he might wait a few more weeks until a train-load of men had accumulated.

The further one was from the fighting, the higher was the proportion of men in hospitals who were there for disposal. In 1944 I was stationed with a large hospital near Madras, whose main source of patients was the Arakan Front, whence they travelled first to Chittagong and then by hospital ship. The surgical division was largely filled with the wounded, but the medical division was often a very depressing place. Ward after ward might be nearly full of useless riff-raff ned: the stoves were useless. Together, my her-in-law and I can just move each of them: so. much sweat we got them into the kitchen passage. e they took a couple of feet off the fairway—until Sunday.

From time to time we've tried to find a scrap-iron ant to take them away, and a fortnight ago I ght I had succeeded. Our local rag-and-bone shop sed to get a man to call with a barrow. I advised men, but the rag-and-bone lady thought one could ge. A week went by and nothing happened, and could stand the sight of the beastly things no longer. ery reluctantly my brother-in-law was persuaded to me in getting them into the back garden. We tried iding them, but they wouldn't slide. We tried rollers nder them but they wouldn't roll. So we heaved and hoved and lifted. The first one wasn't too bad. But the econd was a devil. We got it about four yards of the way hen I collapsed. My entire erectores spinæ seemed to ave divided. I was locked in agony in an anthropoid osition. My brother-in-law, who is a lawyer, offered anipulation, which I refused. After half-an-hour's rest, ke a fool, I returned to the fray. This time it went good nd proper, and I am now resting my prolapsed disc nd blessing the day those stoves arrived. . . .

This afternoon Jeremy rushed upstairs in high delight. Daddy," he said, "the man's been for the stoves." How did he move them?" I asked. "Oh! he just icked each one up and put it on his little hand-cart." eeing my face, he added: "he was much bigger than ou, at least seven or eight feet tall; and he told me that hen all the rag-and-bone men had a competition to e how much they could carry on their little carts, he on with fourteen and a half tons."

* * *

Last week I went to the Swedish church in London to e the Lucia. Every town, village, and office in Sweden hooses its prettiest girl for its Santa Lucia on Dec. 13. he wears a crown of spruce leaves bearing lighted candles nd walks in procession with her maids of honour, who fterwards bring round the coffee which is drunk with e traditional Lucia food. Santa Lucia symbolises the turn of the light. Nowadays Lucia's candles are electric, hough I cannot imagine where she keeps the battery. nd I thought it was further symbolic of the infiltration our all-demanding modern way of life even into the dest customs that, at the charming ceremony in ondon, poor Lucia had to make her procession a second me, not now in the dark, as Lucias always have done, ut with arc lights blazing and movie cameras burring, nd there was a microphone recording the Lucia songs.

* * *

Here is an extract from a letter written by Mr. Lamuell radley, surgeon at Dunster, Somerset, on Dec. 16, 38. Until I read it at the British Museum I did not alise how dangerous a Christmas goose can be.

A woman, aged 32, "of good Complexion, handsome statue d healthy Constitution," a year previously plucked five ese; they had been killed by a mad dog, and it seemed ity to waste them, particularly at Christmas time. "The next mation she was seized with a Horror, a trembling, and a eat anxiety of Spirits, which wore off and returned accordg to the state of the moon." The patient thought she as suffering from "the effect of the Poyson which the og had transmitted to these Birds," so she went to "a llow in the Neighbourhood, famous for Curing Mad Cattle: accordingly furnished her with his Drench of which she ok two Quarts at divers doeses: the symptoms of the adness then appeared no more, but sometime after she was iz'd with violent excruciating Pains in her Limbs, which blig'd her to keep to her Bed."

When seen ("As I visited a Patient hard by, I was sent for give my opinion on this Woman"), the bones in one leg, oth thighs, and one arm were found to be "entirely divided the middle." The sternum and ribs were strongly conracted, and the woman's standing height was reduced by ft. She died about 10 months after the plucking of the ese. Autopsy revealed that "the substance of the Bone as reduc'd to the form like to the yolk of an Egg: and what ttle was left was as thin as the Horn of a Lantern, and erfectly flexible."

With some relief I turned to the next MS in the llection—an "Ode to the Right Honourable the Earl Oxford." We are not having goose this Christmas.

Letters to the Editor

CONTROL OF TUBERCULOSIS

SIR,—May I comment on the letter by Dr. Mashiter and others in your issue of Dec. 10?

The control of tuberculosis might have been advanced had the signatories paid a visit to any clinic, in their own region, from which domiciliary management is being undertaken. They would have been able to study the reasons for such a development, the types of cases treated, and the technique employed. They might have discussed with medical, nursing, and welfare staff, and with patients, the psychological and other advantages which accrue from prolonged bed rest at home in contrast to periods in sanatoria where treatment has become such "an intensive process." Finally, they might have furthered the association of sanatorium with domiciliary supervision, thus promoting more efficient use of available beds. Appeals for such coöperation have been made frequently during the last few years but have met with little or no response.

The letter would have carried some conviction if any evidence had been produced that the intensive processes of modern sanatoria had contributed aught towards solving the problem of tuberculosis. Statistical evidence in this country has so far failed to substantiate such a claim. Had the writers reviewed Professor Heaf's first presidential address to the British Tuberculosis Association, they would have recalled his warning that far too much time is spent in the application of intensive processes to unsuitable cases. This has contributed largely to the present breakdown in tuberculosis administration, and has led to delays of nine months or more in the admission of treatable cases.

Domiciliary supervision and management, accompanied by frequent home-visiting, give to all clinic staff a much closer insight into the economic and social aspects of the disease. The value of welfare work is enhanced, and closer relations with the family lead to an increase in contact examinations. (In Willesden, contact examinations have doubled in the last three years.) There can be no more effective preventive measure than the conversion of infectivity. This can be rapidly secured in many cases by immediate rest under proper control and supervision in the patient's own home.

The devastations of two world wars have depleted the British community of industrial man-power. Tuberculosis is claiming a toll from our industrial population (in the age-group 15–50 years) far greater than that caused by any other disease. It is appalling that sufferers from this disease should be precluded from admission to all but a few hospitals and should be forced to wait many months for the institution of treatment. Such neglect leads but to further cases of disease.

In your issue of Dec. 10 Dr. Brailsford suggests that it is unjustifiable to admit, knowingly, patients with open tuberculosis to a general hospital. May I repeat that experience at the Central Middlesex Hospital completely refutes this view? Tuberculous patients are nursed in special wards to which are transferred *immediately* any open cases discovered in the general wards. Such a policy has resulted in an incidence of infection, as evinced by Mantoux-conversion in nurses, *considerably less* than in the better of the two groups reported by the Prophit Survey. A similar administration and lowered incidence of infection was reported by Dr. Court in your issue of Nov. 12.

Effort must be concentrated on increased coöperation with general practitioners in a search for cases in an early stage of disease. The admission of such patients to general hospitals for treatment in special wards can no longer be denied on the grounds of danger to nursing staff. The present position is so chaotic that instant to hospital in Malta, whence he was transferred to Egypt and later to Durban. According to his documents there was never any evidence of tuberculosis.

DISCUSSION

If most cases of malaria had been treated in their own units, instead of being held in hospital for 2 or 3 weeks; if amœbiasis had been diagnosed clinically and its victims had been kept in hospital as a routine for some 2 weeks, instead of 8 or more; if the time spent in hospital by soldiers with other acute diseases had been much less; and if admission for investigation and disposal had not occurred—then the number of beds needed to serve the Burma theatre would have been greatly reduced. And because of the lessened pressure on the evacuation and reinforcement machinery those who were admitted to hospital would not have travelled nearly so far, and those returning to duty would not have stayed so long in transit camps. If in addition convalescent depots had been reserved for front-line infantry and others living similarly active lives, and if the stay there had been considerably cut down, the number of soldiers hors-de-combat for medical reasons could have been enormously reduced, possibly to a tenth, or at most a fifth, of the actual figure.

Although so huge a number of soldiers were unnecessarily hors-de-combat as the result of sickness, this actual *figure* was not in itself particularly serious. For by the very nature of war only a small proportion of the fighting soldiers of an army are, at any one time, actually engaged with the enemy. Many may be in units in reserve, refitting, or retraining; others may be on leave, awaiting posting, or travelling from one theatre to another. The real gravity of the situation is to be found in the *disorganisation of units.* In reference to the Burma campaign, Marriott (1945) says:

> "The effect of disease in wasting man-power is not to be measured merely by arithmetical calculation of man-days lost—gigantic as has been this total. There must also be reckoned the effects due to disruption of units and the influence on morale. In the Arakan campaign in 1943 some units were losing their entire personnel, with replacement by reinforcements, every six to eight weeks. Imagine the task of commanders trying to operate forces, in the face of the already fearful difficulties of climate, terrain, and supply, with all their officers, N.C.O.s, and men constantly changing."

It was not, indeed, surprising that the campaigns of 1943 and 1944 in Burma were so unsuccessful.

I suggest that during a campaign all units should be encouraged, if local circumstances allow, to retain those of their acute sick who look likely to recover soon. As a corollary, the position of regimental M.O. should be considered one of the most important in the R.A.M.C., and confined to sound doctors of good personality. Even soldiers affected by certain mildly disabling disorders which are incurable while they remain on duty but curable in hospital (e.g., jungle sores and some other skin conditions, otitis externa, and many minor surgical lesions) may properly be retained with their units until these are withdrawn from the fighting line. Useless men whose presence adversely affects morale and endangers the lives of others should be disposed of through non-medical channels. Even if their units do not receive reinforcements to replace them, their disappearance will be a gain.

In Burma, in so far as the evacuation of sick and wounded was necessary, far greater efforts should have been made to prevent it from proceeding beyond field-ambulance level. Those brilliant and ingenious feats of air evacuation to base hospitals, which received so much publicity and appealed so strongly to the public mind, should, in general, have been reserved for the severely wounded and those with grave diseases such as typhus fever.

(*To be concluded*)

In England Now

A Running Commentary by Peripatetic Correspondents

A LITTLE while ago, on the spur of the moment, I exchanged our comfortable family saloon car for an ancien sports tourer. So far as cars are concerned I am abou the same mental age as my small son aged five, and together we agreed that the new old car was much more "sporty" than the old old car. Since then the daily trip from our small country cottage into the university town, where he and my daughter attend school and I work at the hospital, has become altogether more adventurous. I will pass swiftly over the early days when the moribund batteries made starting difficult and my unfortunate wife was dragged out to help push the car as fast as possible down a gentle slope to make the engine fire; the discovery that the reason for the stiff and erratic steering was three broken leaves in the near front spring, including the main leaf, which was attempting to perform its proper function in defiance of natural laws; and the unpleasantness of the first heavy rain when gouts of water poured on us through the threadbare canvas roof. The sequel to these disturbing but relatively trivial events was more alarming.

Starting off late (as usual) for school one day, I shot along our country road as fast as the cold engine would gather speed, but we had gone only a mile when disaster overtook us. The road there takes a gentle right-hand bend and is heavily scarred with pot-holes. As I bumped round this curve at about 40 m.p.h., imagine my horror to see the near-side door fly open and my small son precipitated out like a shot from a gun. My daughter started screaming from the back, and as I jammed on the brakes I felt that each bump might be his body. But small boys are tough, and by the time we had stopped the lad was picking himself up and shouting like the devil. I knew immediately he could not be much hurt, and running back to him I discovered that under a lot of dirt and a good deal of blood there were merely superficial grazes on both knees and the back of one hand. (It seems clear that we ought to start training our future parachutists at a very tender age.) I picked him up and put him in the car and drove back to the cottage with my daughter leaning over from the back and holding the boy firmly pinned in his seat for fear he should once more disappear. As I drew up at the cottage with a good deal of tooting on the horn, my wife appeared at the door, and with true feminine intuition, said as she looked me straight in the face: "He's fallen out."

I had to admit it, of course, and I did so rather nervously because she had told me several times that I must fit an additional fastener to the offending door, because there was no means of locking it. However, her relief at finding the boy unhurt saved me from recriminations, and after bathing and bandaging the grazes I took him off to school once more in the car, on the principle that a thrown rider should get back on his horse or a pilot should fly again as soon as possible after a crash. He came willingly enough, but insisted on sitting in the back, a decision with which I sympathised. But by the afternoon, when I went as a special act of thanksgiving to take the children home instead of leaving them to catch the country bus, he had recovered his spirits and insisted on sitting in front as usual. In fact he was feeling rather pleased with himself, because he had gained great kudos at school through embellishing the story (he is a born fisherman) by saying that he had fallen out while we were doing 65 m.p.h. and had been half-killed. But I was careful to buy an extra catch for the door on the way home and fix it on before I went in for tea.

* * *

When my brother-in-law brought home two cast-iron stoves he had won, I was delighted. Our house is an Early Victorian ice-box, and here was at last a chance of warming at least part of it. We installed and black-leaded the stoves and lit them. Smoke belched forth from all sides and they became just perceptibly warm. We consulted the experts and our worst fears were

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DISCUSSION

If most cases of malaria had been treated in their own units, instead of being held in hospital for 2 or 3 weeks; if amœbiasis had been diagnosed clinically and its victims had been kept in hospital as a routine for some 2 weeks, instead of 8 or more; if the time spent in hospital by soldiers with other acute diseases had been much less; and if admission for investigation and disposal had not occurred—then the number of beds needed to serve the Burma theatre would have been greatly reduced. And because of the lessened pressure on the evacuation and reinforcement machinery those who were admitted to hospital would not have travelled nearly so far, and those returning to duty would not have stayed so long in transit camps. If in addition convalescent depots had been reserved for front-line infantry and others living similarly active lives, and if the stay there had been considerably cut down, the number of soldiers hors-de-combat for medical reasons could have been enormously reduced, possibly to a tenth, or at most a fifth, of the actual figure.

Although so huge a number of soldiers were unnecessarily hors-de-combat as the result of sickness, this *actual figure* was not in itself particularly serious. For by the very nature of war only a small proportion of the fighting soldiers of an army are, at any one time, actually engaged with the enemy. Many may be in units in reserve, refitting, or retraining; others may be on leave, awaiting posting, or travelling from one theatre to another. The real gravity of the situation is to be found *in the disorganisation of units*. In reference to the Burma campaign, Marriott (1945) says:

> "The effect of disease in wasting man-power is not to be measured merely by arithmetical calculation of man-days lost—gigantic as has been this total. There must also be reckoned the effects due to disruption of units and the influence on morale. In the Arakan campaign in 1943 some units were losing their entire personnel, with replacement by reinforcements, every six to eight weeks. Imagine the task of commanders trying to operate forces, in the face of the already fearful difficulties of climate, terrain, and supply, with all their officers, N.C.O.s, and men constantly changing."

It was not, indeed, surprising that the campaigns of 1943 and 1944 in Burma were so unsuccessful.

I suggest that during a campaign all units should be encouraged, if local circumstances allow, to retain those of their acute sick who look likely to recover soon. As a corollary, the position of regimental M.O. should be considered one of the most important in the R.A.M.C., and confined to sound doctors of good personality. Even soldiers affected by certain mildly disabling disorders which are incurable while they remain on duty but curable in hospital (e.g., jungle sores and some other skin conditions, otitis externa, and many minor surgical lesions) may properly be retained with their units until these are withdrawn from the fighting line. Useless men whose presence adversely affects morale and endangers the lives of others should be disposed of through non-medical channels. Even if their units do not receive reinforcements to replace them, their disappearance will be a gain.

In Burma, in so far as the evacuation of sick and wounded was necessary, far greater efforts should have been made to prevent it from proceeding beyond field-ambulance level. Those brilliant and ingenious feats of air evacuation to base hospitals, which received so much publicity and appealed so strongly to the public mind, should, in general, have been reserved for the severely wounded and those with grave diseases such as typhus fever.

(To be concluded)

In England Now

A Running Commentary by Peripatetic Correspond

A LITTLE while ago, on the spur of the momen
exchanged our comfortable family
sports tourer. So far as cars are
the same mental age as my sm
together we agreed that the new old car was much
"sporty" than the old old car. Since then the
trip from our small country cottage into the unive
town, where he and my daughter attend school a
work at the hospital, has become altogether
adventurous. I will pass swiftly over the early
when the moribund batteries made starting diffi
and my unfortunate wife was dragged out to help
the car as fast as possible down a gentle slope to m
the engine fire; the discovery that the reason for
stiff and erratic steering was three broken leave
the near front spring, including the main leaf, which
attempting to perform its proper function in defia
of natural laws; and the unpleasantness of the
heavy rain when gouts of water poured on us thro
the threadbare canvas roof. The sequel to th
disturbing but relatively trivial events was m
alarming.

Starting off late (as usual) for school one day, I s
along our country road as fast as the cold engine wo
gather speed, but we had gone only a mile when disa
overtook us. The road there takes a gentle right-h
bend and is heavily scarred with pot-holes. As I bum
round this curve at about 40 m.p.h., imagine my hor
to see the near-side door fly open and my small
precipitated out like a shot from a gun. My daugh
started screaming from the back, and as I jammed on
brakes I felt that each bump might be his body.
small boys are tough, and by the time we had stop
the lad was picking himself up and shouting like
devil. I knew immediately he could not be much hu
and running back to him I discovered that under a
of dirt and a good deal of blood there were mer
superficial grazes on both knees and the back of one ha
(It seems clear that we ought to start training our fut
parachutists at a very tender age.) I picked him up a
put him in the car and drove back to the cottage w
my daughter leaning over from the back and hold
the boy firmly pinned in his seat for fear he shou
once more disappear. As I drew up at the cotta
with a good deal of tooting on the horn, my wife appea
at the door, and with true feminine intuition, said
she looked me straight in the face: "He's fall
out."

I had to admit it, of course, and I did so rather nervous
because she had told me several times that I must fit a
additional fastener to the c
was no means of locking it.
the boy unhurt saved me from recriminations, and
bathing and bandaging the grazes I took him off
school once more in the car, on the principle that
thrown rider should get back on his horse or a pil
should fly again as soon as possible after a crash.
came willingly enough, but insisted on sitting in th
back, a decision with which I sympathised. But by th
afternoon, when I went as a special act of thanksgivin
to take the children home instead of leaving them
catch the country bus, he had recovered his spirits an
insisted on sitting in front as usual. In fact he wa
feeling rather pleased with himself, because he had gaine
great kudos at school through embellishing the sto
(he is a born fisherman) by saying that he had falle
out while we were doing 65 m.p.h. and had been ha
killed. But I was careful to buy an extra catch for th
door on the way home and fix it on before I went in fo
tea.

* * *

When my brother-in-law brought home two cast-iron
stoves he had won, I was delighted. Our house is an
Early Victorian ice-box, and here was at last a chance o
warming at least part of it. We installed and black
leaded the stoves and lit them. Smoke belched fort
from all sides and they became just perceptibly warm
We consulted the experts and our worst fears were

mg.) with calcium phosphate (gr. 1), given six to hours after an initial dose of vitamin-K analogue mg.) with nicotinic acid (50 mg.), capped, so to the effect of the latter, rendering further dosage essary while giving the same guarantee of immunity.

I have not found that either vitamin P or calcium phosphate *alone has this highly desirable effect, and I* m unable to explain the action of the calcium phosphate, hough a connexion between vitamin P and blood-alcium has been suggested.[2] I should add, however, hat, in combination with vitamin P, in repeated doses nd in the above ratio, calcium phosphate appears to nhance the effect of the vitamin as a urinary sedative nd diuretic and also in rapidly relieving symptoms in he most acute cases of neuritis and fibrositis.

The above notes apparently suggest two different unctions of vitamin P—one affecting immunity, the ther bearing a more obvious relation to permeability.

The case of kala-azar quoted by Dr. Corkill, which as also being treated with antimony tartrate, should e considered in the light of evidence of some degree of ntitoxic effect of vitamin P in cases treated with organic rsenicals,[2] the close chemical analogy between arsenic nd antimony being suggestive.

It therefore appears possible that vitamin P exerts its pparent antitoxic or anti-infective effects by correcting preclinical or intraclinical increase in capillary permeability, thus reducing toxic absorption in cases of drug dministration and, in infective cases by the same echanism, allowing the body time to initiate antibody rmation. In this connexion the grave prognosis usually sociated with the hæmorrhagic and purpuric forms of fectious diseases is interesting and, as Dr. Corkill has ready suggested, invites further investigation.

Ffestiniog, Wales. D. MARCUS EVANS.

THE HEALTH OF NURSES IN HOSPITAL

SIR,—I would join with your correspondent, Dr. Brails-rd (Dec. 10) in the plea for greater concern for the health our nurses in hospital. The incidence of tuberculosis ay be greater in the nursing staff of general hospitals an that of the general population; but at least this ease occurs in a known group of staff, and if adequate dical care is provided the infection can be diagnosed rly and medical treatment started, with a consequent eater chance of recovery.

Over a period of four years' observation in Withington spital it was found that one-third of our entrants as ident nurses were Mantoux-negative. The number such Mantoux-negative reactors was 84, and of this mber 12 developed tuberculosis—i.e., 14%. During same time there were 172 primary positive reactors, whom only 2 developed tuberculosis—i.e., approxitely 1%.

f the hospitals find it impossible to prevent open es of tuberculosis being admitted to the wards, then s their duty to see that all known methods of detection the early lesion in their staff be applied. In the case the negative reactors in this hospital the test was eated each three months until conversion, and after t time a monthly body-weight and three-monthly ncal and radiographic examinations were made. o—and most important—these girls had impressed on them that they must report if they did not feel ll. Can one also hope that one senior physician be de responsible for the health of the staff, rather than ries of changing resident medical staff, for in my w this is one of the most important principles in nexion with the full medical care of nursing staffs hospital?

ithington Hospital, Manchester. J. M. GREENWOOD.

CEREBRAL PALSY

SIR,—The account by Dr. Agassiz and his colleagues of the early signs of cerebral palsy was most helpful. We should be interested to know what were the sources of their cases aged 6 months or under, and how many such infants have been diagnosed and treated. In Birmingham, where, at a special cerebral palsy clinic, we have seen over 200 cases a year for two years, we find it exceptional for the mother to have noticed anything wrong with her baby until the age of 6 to 9 months. Usually she has first consulted a doctor towards the end of the first year, when she is worried because the baby is not yet sitting up. Thus doctors seldom have the opportunity of diagnosing cerebral palsy in very young infants. Welfare doctors, who see infants in the early months, are not likely to look for the signs described by Agassiz et al. unless specially consulted about the child's backwardness, which, as mentioned above, the mother has probably not yet noticed. Backwardness, rather than stiffness and abnormal movements, has been the mother's first complaint in the overwhelming majority of cases. But so many normal children fail to pass the usual milestones at the age laid down in the textbooks that special clinics would soon be overloaded if every baby who is slow to smile or raise its head were referred to them.

An early case may occasionally be picked up at a follow-up clinic where infants who have suffered from birth injury or jaundice are studied. Such studies are at present being carried out in this department.

One other point: from our experience we feel that, in the past, too much stress has been laid on the discrepancy between the intelligence of spastics and athetoids. In a series of 340 cases where the intelligence was assessed, 49% of all cases had an intelligence quotient of less than 70, and the mean intelligence quotient of spastics and athetoids was not significantly different.

PATRIA ASHER
F. ELEANOR SCHONELL

The Children's Hospital, Birmingham.
Research Fellow, University of Birmingham.

SIR,—I feel that the observation made by Dr. Agassiz and his colleagues, that cerebral palsy associated with rhesus iso-immunisation is complicated by such severe mental retardation as to make treatment impossible or of no avail, should not be allowed to pass without comment. I have recently reviewed 36 cases of kernicterus which survived the neonatal period, the eldest patient being twenty-three years old. The more severely affected children developed a remarkable degree of extrapyramidal rigidity within the first six months of life; 9 of these died before reaching the age of three years; and it is cases which fall into this category, I presume, that Dr. Agassiz and his colleagues find to be virtually untreatable. The disability in the remainder varied from a mild chorea to a severe athetosis.

It has been difficult to forecast the ultimate extent of the physical handicap even when the child has reached the age of a year, and it has been impossible to be certain of the degree of mental impairment before the child has reached the age of four; the greater the child's physical handicap the older he must be before the level of intelligence can be adequately assessed. For example, at the age of eight, one severe athetoid was considered by a competent doctor to be a complete idiot and largely paralysed; at the age of eighteen he is still largely paralysed but he can now carry on an intelligent conversation, he has an extensive vocabulary, and he is the first to observe his diabetic mother's impending hypoglycæmia and to tell her to take a lump of sugar. Two other patients are earning their own livelihood, one as an usherette in a cinema and the other assisting in his father's shop. Two children are attending State

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Bicknell, F., Prescott, F. The Vitamins in Medicine. London, 1947; [illegible] relief could be obtained if 25% of acute medical beds in general hospitals could be assigned for the admission of treatable cases of respiratory tuberculosis. These beds should be controlled by the physician in charge of the associated chest clinic. In coöperation with a thoracic surgeon, he can utilise his beds to the best advantage by a close combination of hospital and domiciliary supervision. It follows naturally that if economy in bed usage can thus be secured, a more efficient use of sanatorium beds could be achieved by similar administration.

The interests of many thousands of tuberculous patients will best be served by the evolution of a system whereby one physician will be responsible both for their inpatient care and outpatient supervision in the chest clinic.

Willesden, London, N.W.10. C. H. C. TOUSSAINT.

SIR,—In your issue of Dec. 10, eight distinguished sanatorium physicians deal with the suggestion that chest-clinic physicians should have personal control of patients under treatment in the sanatorium as well as at the chest clinic, and they describe this proposal as retrograde. They suggest that the sanatorium physician would thus be displaced and the care of patients given to juniors controlled by an occasional visit from the clinic physician.

If this were true it would be a step in the wrong direction. But we believe that there is no reason why the chest-clinic physician should not be on the staff of the sanatorium serving his area and be allocated a number of beds to deal with part of his waiting-list. These cases would be treated in collaboration with the sanatorium physician. Such beds should comprise only a limited proportion of the total sanatorium beds. The remainder would consist of units under the sole charge of the sanatorium physician, and in these he would be able to carry out his functions of teaching and research even more effectively than at present.

Patients could then be admitted when they were ready to obtain most advantage from sanatorium treatment and not when their names came to the top of the waiting-list. The clinic physician would no longer have to guess whether his patient would still be likely to require sanatorium treatment after ten months or a year, as at present, but would be able to integrate the patient's home and sanatorium treatment so that the one would be a well-planned continuation of the other.

The flexibility of such a scheme, which would allow home treatment, general hospital treatment, or sanatorium treatment to be deliberately selected as and when required, would go a long way towards lessening present sanatorium waiting-lists, which, as the writers point out, are also being continually increased by recent therapeutic advances. It would, however, by reason of the increased turnover of patients, put an added strain on the nursing staff.

Surely a policy like this would not impair the work of either branch of tuberculosis control but would link up sanatorium and clinic teams to their mutual advantage.

HUGH CLIMIE

Ealing Chest Clinic, London, W.13. PETER W. ROE.

SIR,—I agree with Dr. Ruth Dingley (Dec. 3) that we should not allow children to leave school with undetected tuberculosis; but for my part I favour annual examination of all school-children by mass miniature chest radiography. In the City of Nottingham it has been the practice since 1944 to X ray all school leavers and to X ray the children from grammar schools, high schools, technical schools, and colleges, and university students, as nearly as possible once a year. The following table shows the cases of tuberculosis found by this means in three grammar schools.

GRAMMAR SCHOOL A (MALES)

Year	*No. radiographed*	*No. of activ*
1944	134*	–
1945	288	–
1946	415	1
1947	736	1
1948	881	1

GRAMMAR SCHOOL B (FEMALES)*

Year	*No. radiographed*	*No. of activ*
1945	417	2
1946	375	–
1947	689	–
1948	682	–
1949	697	2

GRAMMAR SCHOOL C

	Males	*Females*	*Total*	*Active males*	*Active females*
1945	210	190	400	1	2
1946	204	164	368	1	1
1947	376	298	674	1	–
1948	55	38	93*	–	–
1949	320	272	592	–	–

* School leavers only.

The active cases of post-primary tuberculosis discov in these schools were completely unsuspected, in spit the excellent inspections of the school medical serv Unfortunately not all of them were early cases; some had bilateral disease. But the important thin that they were completely unsuspected! Neither v they all of school-leaving age.

In Grammar School B no active cases were fo during 1946, 1947, or 1948, but two cases were fo in 1949 and others are expected within the next years because in 1948 one of the teachers was founc have active pulmonary tuberculosis with a posi sputum. It is highly desirable that all teachers sho be radiographed with their classes.

To my mind, Mantoux-testing of groups of sch children is not a practical proposition, whereas m miniature chest radiography is ideally suited for t purpose, and can easily cope with large groups at rate of 100 volunteers per hour. The X-ray examinat is speedy and relatively inexpensive, and when scheme is carefully organised it interferes but little w the normal school routine.

Mass miniature radiography does *not* create a tuber losis phobia in children. It is our practice for somec to visit the school before the X-ray survey takes pl at each school to explain to the children what it is about, and the value of the examination. Most child would, I think, prefer a speedy miniature chest X-r examination to being "pin-pricked" for a Manto test.

A. E. BEYNON
Medical Directo
and Chest Physician

Chest Radiography Centre,
Nottingham.

VITAMIN P AND ANTIBODY PRODUCTION

SIR,—I was greatly interested to read in your is of Dec. 10 the letter from Dr. Corkill, in which he dra attention to the possible connexion between vitamin and antibody production in response to infection. I shou like to record some phenomena which may have so bearing on it and may also help to throw light on t ultimate physiological function of this vitamin.

In following up my earlier investigations into t effects of vitamin-K analogue in a number of min toxic and infective conditions,[1] I devised a simple a rapidly effective method of treating the common col which consisted in a six-day course of vitamin- analogue (10 mg. once daily) with nicotinic acid (50 m twice daily). In most cases so treated during the pa two years this routine has ensured immunity for abo three months. Later, while studying the effects vitamin P [illegible] conditions, I noticed a apparently [illegible] toxic states, and afte much experiment I found that a single dose of vitamin

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1. Evans, D. M. *Practitioner*, 1946, 157, 391.

stiffness during the day, but we have not observed any lation to the time of the injection.

As Lewin and Wassén also noted the skin in the articular gion to be warmer and redder following the injections, serial in-temperature readings have been made, which do not nfirm their observations. One patient stated that he did el warmer after his second injection, and one sweated freely ter his second injection.

8 inpatients have received 5 mg. of deoxycortone acetate ramuscularly and 1 g. of ascorbic acid intravenously daily, r periods varying from four to fourteen days.

Of these patients, 3 are definitely worse and their injections ve been stopped; 3 are improved; and 2 are unchanged. f the "improved" patients, 2 walk more easily, and the d has increased strength in a previously badly affected rist. Only 1 of these cases has shown improvement greater an expected from simple physical treatment.

(c) Of the 2 outpatients, 1, a youth, aged twenty-two, with rly rheumatoid arthritis (joint-pain, no swelling or deformies) of moderate severity has had three combined injections. is pains disappeared one hour after the first injection and e remained pain-free for twenty-four hours. He received ree combined injections in one week and then stated that s pains had completely disappeared. Unfortunately in this se no objective measurements were possible. The other patient after two injections has shown slight improvement.

Briefly, then, of 17 patients, 4 are worse, 1 is better, nd the remainder show only the improvement expected om simple physical treatment. We intend to continue ith our therapeutic experiments under close observa-on. The main purpose of this letter is to indicate that ur preliminary trials do not support the optimism gendered by the original report of Lewin and Wassén.

S. J. HARTFALL
R. HARRIS.

Leeds.

SIR,—When the preliminary communication by the wedish workers Lewin and Wassén was published in our issue of Nov. 26, five active cases of rheumatoid thritis were in the Tindal General Hospital, and it as decided to treat them with deoxycortone acetate id ascorbic acid for a week. To obtain an unbiased inion, a surgeon saw each case before the treatment as begun, and again at the end. His findings are sed on the amount of pain and swelling in the worst ints, the degree of movement present, &c. All other eatment was stopped during the trial period, and the sage and duration of treatment were the same for ch patient, though cases 1 and 4 had, in addition to the ll course, a single preliminary injection of deoxycortone etate and ascorbic acid before the trial was begun; hile case 4 was so obese that all the injections were ven intramuscularly and it was impossible to complete l her investigations. It should be remarked that ewin and Wassén found that equally good results ere obtained if all injections were given intramuscularly.

The course of treatment consisted of three injections ily for the first 2 days; two injections daily for other 2 days: and then one injection a day for a rther 3 days, between Dec. 1 and 7, inclusive. The sage of each injection was 5 mg. of deoxycortone ctate in oil intramuscularly, followed within a few inutes by 1000 mg. of ascorbic acid (10% solution) travenously (the night doses on the first 2 nights ing given wholly intramuscularly). This is well up to e dosage recommended by Lewin and Wassén, and, anything, is higher than they consider necessary.

CASE 1.—A man, aged 27, with 4 years' history of pain nd stiffness in shoulders, wrists, knees, ankles, and temporo-andibular joints. Wasting of intrinsic muscles of hand. oor general condition.

Before trial: Shoulders, elbows, knees, and wrists involved, ith increasing deformity of hands. X-ray films of hands ggestive of rheumatoid arthritis. E.S.R. 15 mm./hr. Wintrobe); Hb 84%; B.P. 115/70 mm. Hg. Weight st. 9½ lb.

After trial: Less tenderness in all joints, especially the wrists, but no increase in range of movement. E.S.R. 3 mm./hr; Hb 80%; B.P. 135/80 mm. Hg. Weight 8 st. 7½ lb.

Patient's impression: "The injections make me feel happy. Feel a little better."

Surgeon's impression: Little subjective or objective improvement.

CASE 2.—A woman, aged 60, with 4 years' history of pain, tenderness, and swelling in the left shoulder and both feet. Later both hands and right knee involved. Poor health.

Before trial: Pain and tenderness in right elbow, both wrists, and right knee and ankle; with wasting of hand muscles. X-ray films show cystic changes in heads of metacarpals. E.S.R. 50 mm./hr; Hb 87%. Serum-sodium 315 mg. per 100 ml. Weight 9 st. 10½ lb. B.P. 140/75 mm. Hg.

After trial: Practically no change. E.S.R. 40 mm./hr. Hb 83%. Serum-sodium 345 mg. per 100 ml. Weight 10 st. 1½ lb. B.P. 135/80 mm. Hg. A trace of œdema.

Patient's impression: "It makes me feel cheerful. Otherwise no effect."

Surgeon's impression: No subjective or objective improvement.

CASE 3.—A woman, aged 67, with 2 years' history of pain and stiffness in knees; later shoulders and hands involved. Complicated by pernicious anæmia and Raynaud's phenomenon in hands.

Before trial: Pain and stiffness in wrists, some wasting and ulnar deviation of metacarpals, with poor finger-flexion. X-ray films of knees show osteo-arthritic changes; wrists show much decalcification suggestive of rheumatoid arthritis. E.S.R. 35 mm./hr.; Hb 91%. Serum-sodium 350 mg. per 100 ml. B.P. 140/75 mm. Hg. Weight 10 st. 2½ lb.

After trial: No change in joints. E.S.R. 12 mm./hr: Hb 85%. Serum-sodium 310 mg. per 100 ml. B.P. 160/90 mm. Hg. Weight 10 st. 3 lb.

Patient's impression: Injections make her feel happy. Otherwise no change.

Surgeon's impression: No subjective or objective improvement.

Note: This patient presents all the appearances of rheumatoid arthritis, but we think it just possible that she may eventually prove to be a case of lupus erythematosus (disseminata) despite the absence of skin lesions at present.

CASE 4.—A woman, aged 45, with 15 years' history of pain in shoulders, arms, and ankles, with marked limitation of movements and ulnar deviation of metacarpals. Increasing obesity since 1940.

Before trial: Pain in shoulders, wrists, and ankles. No movement at elbows, no pronation-supination, and practically no movements of thumbs and ankles. Marked tenderness. X-ray film of elbow shows osteo-arthritis with rheumatoid changes.

After trial: Very little pain in joints. Slightly increased movements of elbows, thumbs, and ankles.

Patient's impression: Very pleased. Injections make her cheerful.

Surgeon's impression: Not very much real change.

CASE 5.—A woman, aged 60, with 3 years' history of pain and stiffness in hands and knees. Has felt poorly, and since April, 1949, has spent most of the time in bed.

Before trial: Pain and tenderness in right shoulder and wrists, and wasting of hands. Much swelling and pain in knees and ankles. X-ray films of wrists show fairly advanced rheumatoid arthritic changes in carpus. E.S.R. 53 mm./hr.: Hb 67%. Serum-sodium 340 mg. per 100 ml. Weight 6 st. 10 lb. B.P. 110/70 mm. Hg.

After trial: Less pain and no tenderness in shoulders, wrists, or knees, with increased range of movement in left knee. E.S.R. 40 mm./hr.; Hb 76%. Serum-sodium 330 mg. per 100 ml. Weight 6 st. 11½ lb. B.P. 120/75 mm. Hg.

Patient's impression: Greatly relieved. Life is worth living once more. Treatment made her cheerful and she has been sleeping and feeling better.

Surgeon's impression: Marked subjective and some objective improvement.

schools and another a private school. Of those over the age of four whose intelligence quotients have been assessed, 6 out of 15 have an intelligence quotient of 70 or over, the best 3 being 100, 98, and 95, while 6 have intelligence quotients of 50 or less.

I fully realise that children with kernicterus are often mentally retarded, but to summarily dismiss a severe case, especially in infancy, as being hopelessly mentally deficient is fair neither to the parents nor to the child.

JOHN GERRARD
Lecturer in Pædiatrics,
University of Birmingham.

The Children's Hospital,
Birmingham.

IRON POISONING

SIR,—Will you allow me to add the following case to the most interesting series mentioned in your columns.[1]

On April 23, 1949, at 2 P.M., a healthy 14-month-old male child, while left alone for half an hour, swallowed 30 'Fersolate' tablets. On re-joining the child, the mother noticed that he was in pain, and fortunately perceived at once that he had swallowed the tablets. She administered an emetic of salt and water. The child was sick twice and brought up 15 tablets with the coating still intact.

He was admitted to hospital forthwith and the stomach was washed out, considerable quantities of iron being removed. On admission, his colour was poor and the pulse was weak and rapid. By 8 P.M. his colour and pulse were normal and he appeared to have recovered. He had a good night, and next morning seemed little the worse for his mishap, being discharged to his home later in the day.

The cases you listed have been a salutary reminder to me of the potential gravity of the above case.

North Devon Infirmary, Barnstaple. R. M. J. HARPER.

OBSTETRICAL BRAINS TRUST

SIR,—Though Dr. Hugh Jolly (Dec. 10) may have the support of the *Oxford English Dictionary* in stating that the first ovulation (or the occurrence of spermatogenesis) marks the exact beginning of puberty—"the state or condition of having become functionally capable of procreating offspring"—I venture to suggest that this definition often becomes unworkable. Would Dr. Jolly, for example, regard a woman of 25, whose menarche occurred at 13 but who has had only anovular cycles, as prepuberal; or a man with fully developed accessory sexual organs, but with azoospermia not of acquired type, as similarly prepuberal? The position in circumstances such as these (which are not purely hypothetical) is surely untenable. Indeed, the *O.E.D.* definition breaks down more completely and more frequently than does Dr. Jolly's; for according to the former, a woman with blocked tubes, or a man with blocked vasa deferentia, being "functionally incapable of procreating offspring" would ipso facto be excluded from the state of puberty.

I think the clue to the problem lies in the fact that the gonads have a dual function: they produce both sex hormones and gametes, and whereas there may be hormones without gametes there are never gametes without hormones. Morphologically and psychologically the changes traditionally associated with puberty depend on the incretory function of the gonads; only the reproductive function depends on gametogenesis. Hence it seems illogical to deny the status of puberty to an individual who differs from one accepted as puberal solely in the failure to produce gametes. The fact that the incretory function of the ovary precedes gametogenesis is recognised by the distinction sometimes made between "puberty," defined as the morphopsychological state resulting from the action of the sex hormones, and "nubility," the condition in which gametogenesis is also occurring (strictly meaning "marriageable"). It seems reasonable, therefore, to regard puberty as dependent on the action of the sex hormones and independent gametogenesis; in which case Dr. Jolly's differentiat between sexual precocity and precocious puberty becor little more than a quibble.

Obstetric Hospital, University College
Hospital, London, W.C.1.
G. I. M. SWYER

CHILDREN REFERRED TO THE PSYCHIATRIS

SIR,—It does not seem to me that Dr. Mood explanation (Dec. 10) of the persistence of enur nocturna will hold water—if you will pardon the metap Taken literally, it would imply an "automatic bladd whereas the condition is nothing like that. The enur is nocturnal, which means that inhibition must functioning satisfactorily, on the whole, in the daytin in fact, there clearly *is* what Dr. Moodie calls "a defi sensory impulse," and in the absence of some spe abnormality in the nervous system there is no physi reason why it should not give warning in sleep as v as in waking life. If it fails to do so, we are justif in regarding the symptom, from the point of view treatment, as psychological. A small bladder, whet inherited or acquired, may be a slight handicap, si it demands more of the patient than mere inhibiti —he must actually get out of bed. But I do not see h otherwise than psychologically Dr. Moodie would tr it, short of blowing it up through a catheter. I assume, course, that a training procedure would be classed a form of psychological treatment (though an etymolog might argue that point).

Much the same may be said of crossed cereb laterality, to which Dr. Moodie attributes many cases stammer and backwardness. Whether given or n I suggest it should be regarded merely as a slig handicap, which is of little or no real importance adult life, but which can be made to loom very la in the mind of the child, as indeed can almost anythin

The Psychological Laboratory,
Cambridge.
W. E. HICK

THE TONSIL AND ADENOID PROBLEM

SIR,—I wish to draw your attention to an erro one word in your report (Dec. 10, p. 1087) of my rema at the Royal Society of Medicine on Dec. 2. This occu in the last sentence, where I am quoted as having said "For over two hundred years tonsillectomy has prove a beneficial operation." I actually said "two *thousan* years."

Oxford. RONALD MACBETH.

DEOXYCORTONE ACETATE AND ASCORBIC ACID IN RHEUMATOID ARTHRITIS

SIR,—With the supplies of 'Cortisone' restricted a they are in this country at the moment, many rheumato logists will have been anxious to confirm the prelimina report of Lewin and Wassén in your issue of Nov. 26.

In the last three weeks we have investigated the effec of this therapy on 17 patients, all cases of rheumatoi arthritis. The results have been disappointing; we hav never seen anything like the response obtained wit cortisone in rheumatoid arthritis as demonstrated to on of us at the Mayo Clinic earlier this year.

The cases were in three groups: (*a*) 7 inpatients i Harrogate; (*b*) 8 inpatients in Leeds; and (*c*) 2 outpatient in Leeds—all under the care of one of us (S. J. H.). W may summarise our results as follows:

(*a*) 7 patients have received combined deoxycortone-acetate (DOCA) and ascorbic-acid therapy, in the dosage suggested by Lewin and Wassén, daily for eleven days. They have also had basic minimal physical treatment.

Of these patients, none have shown improvement greater than expected from the simple physical treatment they have received; one is rather worse. Several have shown variations the end of 9–10 minutes a regular heart-beat was hed. After the operation the patient's colour good and his pulse fair. He did not, however, start again, and artificial respiration had to be The patient's general condition gradually ated and he died at 2.15 A.M. The anæsthetist d: "I was engaged on another operation when the supply of oxygen was going low. I called and told her. She went out and called a porter. mpty oxygen cylinder was removed from the and the other substituted. I took it for granted hen I asked for oxygen I would get it."

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[1] Leading article, *Lancet*, Nov. 12, p. 898. Porter, H. *Ibid*, Dec. 3, p. 1060.

coroner found that the patient died from respira- ilure caused by anoxæmia due to nitrous oxide ently administered for oxygen in the course of esthetic given for an operation for a perforated ulcer. "I am bound to think," he observed, was carelessness."

Trichlorethylene Addiction

Birmingham on Dec. 12 a man aged 26 was tried murder of his mother, to whom he was said to be d. According to the *Manchester Guardian* (Dec. 13), employed at a power-station where trichlorethy- as used for processing machinery and for cleaning He had become addicted to the drug by soaking dkerchief in it and sniffing it regularly: and one he attacked his mother when he returned from hift. The prosecution, finding no evidence of accepted the accused's plea of not guilty of murder ilty of manslaughter. Defending counsel said would have called medical evidence that trichlor- e induced a state of delirium with complete loss trol. Sentence of five years' imprisonment was

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Parliament

QUESTION TIME

Medical Services in Malaya

el M. **Stoddart-Scott** asked the Secretary of State if he would make a statement with regard to the services provided for British troops in the Malayan n; and if he would state what improvements could ected in the immediate future.—Mr. **Emanuel** LL replied: The medical services in Malaya include uate number of Service hospitals and medical officers tain the normal health of the troops and to care for and wounded. Difficulties, however, arise in securing ediate surgical treatment of battle casualties. Since is carried on by numerous small columns of troops perate in difficult country and are frequently on the it is impracticable to provide surgical facilities for out operations in the immediate vicinity of the Consequently it is necessary for casualties to be ed to the hospitals where surgical attention can n.

are three Service hospitals in Malaya district, which the mainland of Malaya, but there is only 1 Army and it has accordingly been necessary to utilise the of civil surgeons. In Singapore island there are ervice hospitals and 3 Army surgeons. To meet the cy of surgeons in the Army as a whole, arrangements een made to engage immediately a number of civil s for short-term contracts. Three have already d the terms and conditions of service, and, subject being physically fit, will be sent to the Far East as possible to complete the establishment in that theatre. evacuation of casualties presents great difficulties in f the nature of the country, and efforts have been or a considerable time to devise a suitable means of sport from the jungle to the nearest hospital. Various ave been undertaken and work is now proceeding on dification of three helicopters to make them suitable task. They should arrive in Malaya in April, 1950. meantime, the effects of delay before surgical treatment are being minimised, as far as possible, by the use of penicillin and other drugs.

Colonel **Stoddart-Scott**: Can the Minister say why the first announcement that the War Office made was that there were 7 surgeons active in the Malaya district when the establishment is only for 3 and there is actually 1 surgeon functioning? Would the Minister say why it was not possible to have evacuation by air before next April?—Mr. **Shinwell**: The public relations department of the War Office were correct in the statement they made. They referred to the strength in the whole area, and that was 7. There is one in the Malaya district, 3 in Singapore, and 3 in Hong-Kong. They referred to the whole theatre and not to Malaya in particular. That was what was said and, so far as this was concerned, they were correct. Nevertheless, I agree that it is insufficient, and we are taking all possible steps to deal with the situation.

Mr. **Anthony Eden**: Could I ask the Minister about the helicopters? I understood last March when I was there that they were soon to be expected. Why is it that it cannot be until next April that these helicopters are to be there?—Mr. **Shinwell**: I regret very much that difficulty in this connexion. We were promised the helicopters last March or April, but unfortunately it was discovered that the type of helicopter which was to be made available was unsuitable and modifications have had to take place ever since. I cannot hope to procure them before March or April.

Mr. **Somerville Hastings**: Can the Minister say whether there are not capable surgeons in the R.A.M.C. who could be flown out there at once so that, at any rate, there might be a sufficient number of surgeons able to deal with those who are wounded?—Mr. **Shinwell**: First, I must emphasise that we have experienced no serious difficulty in Malaya. Attention has been drawn to the shortage of surgeons, but it must not be assumed that anything serious has resulted from that shortage, although at the same time I regret the shortage. On the question of flying surgeons from the R.A.M.C. out to Malaya: unfortunately, for some considerable time we have had to give attention to the shortage of surgeons in this country and in other theatres.

Mr. **Quintin Hogg**: The Minister in his first answer concentrated almost entirely on surgeons. Can he give us some idea of other medical attention available? For instance, how long does it take for the casualty to get back to a R.A.P.? Are there casualty-clearing stations and advanced dressing-stations? What is the general picture? Mr. **Shinwell**: The hon. gentleman must not be hot and bothered about this. There is no occasion for engendering heat about it. We want to deal with this matter as speedily as possible, and that is precisely what we are endeavouring to do. As regards the availability of medical services—dressing-stations and the like—the position is by no means unsatisfactory.

Dr. S. **Segal**: Can the Minister say how many surgeons in this area hold consultant status; further, could he not perhaps look into the matter of offering adequate remuneration in order to procure the highest possible type of surgeon-specialist to be flown out to that area?—Mr. **Shinwell**: We are in fact offering excellent terms to civilian surgeons in this country. For service abroad we are offering from £1800 to £2200 a year, according to qualifications. In addition, they will receive a foreign-service allowance and an outfit allowance. On the whole, the terms are rather good.

Colonel **Stoddart-Scott** gave notice that in view of the neglectful attitude of the War Office in this matter he would raise it again on the adjournment of the House at the first opportunity.

Medical Standard of Recruits

Replying to a question Mr. **Shinwell** stated that the number of National Servicemen taken into the Army between Nov. 1, 1948, and Oct. 31, 1949, was 114,856. In the same period 5506 National Servicemen were discharged on medical grounds and 229 died.

Examiners of Food Handlers

Mr. **Charles Taylor** asked the Minister of Health whether, in view of the model by-laws which he had issued to local authorities in England and Wales to ensure cleanliness in the handling, wrapping, and delivery of food, he would make an order giving employers the right to insist on bacteriological examination of employees engaged in these businesses.—Mr. **Arthur Blenkinsop** replied: I know of no powers under which such an order could be made.

It will be seen that in cases 1, 2, and 3 the surgeon could find little or no improvement and these patients themselves noted no convincing improvement either, though in cases 2 and 3 there was a slight fall in the E.S.R. and in case 1 a fall which was so marked that we are doubtful of the accuracy of the reading. In cases 4 and 5 the patients considered there was an undoubted slight improvement, as did the surgeon in case 5. In case 5 also there appears to be a significant fall in the E.S.R. and the most striking clinical results have been obtained.

Three patients (cases 1, 3, and 5) spontaneously remarked that the injections made them feel more cheerful; the other two cases said the same on direct questioning. The blood-pressure rose slightly in all 5 cases, though hardly significantly. Case 2 gained 5 lb. in weight, developed slight œdema, and had an increased serum-sodium at the end of treatment, suggesting that continued treatment at that dosage might carry certain risks with it.

Our own and the ward sisters' impression of the results broadly correspond with the surgeon's and the patients', and have proved disappointing. We are fairly confident that the injections produced a temporary euphoria, which was even remarked on by other patients, and it is possible that this euphoria played a large part in the improvement noted in cases 4 and 5. In no case could the claims of great benefit put forward by Lewin and Wassén be confirmed. On the present evidence we would advise against the indiscriminate use of this treatment in such cases until further work has been done on it.

V. LLOYD HART
Physician.

F. STARER
House-physician.

Tindal General Hospital,
Aylesbury, Bucks.

SIR,—We were most interested, and instructed, by Dr. Kellgren's letter of Dec. 10. We were surprised to read that he had had such bad results in a series of 5 cases of rheumatoid arthritis treated with deoxycortone and ascorbic acid as described by Lewin and Wassén, while we were having good results in a series of 23 cases. We have made verbal inquiries of other workers and hear that some are having failures and some successes. For this incongruity the following explanations are possible:

1. *Differing selection of cases.*—This appears improbable, for we have heard of one worker who has had 11 failures in 11 cases of polyarthritis, whereas we have only had 2 failures in 23 cases. We did no case selection, but treated all cases as they became available at the rheumatism clinics and hospitals we attend.

2. *Unconscious psychotherapeutic suggestion.*—We believe we have now made enough controlled observations to exclude this possibility.

3. *Differences in technique.*—In a treatment which depends on the interaction of two drugs technique is clearly of the greatest importance. It seems that the deoxycortone must be available in muscle at the time the wave of intravenous ascorbic acid occurs. The work so far done suggests that the blood-level of ascorbic acid must be raised to between 5 and 10 mg. per 100 ml. Such a level is obtained by an intravenous injection of 1 g. but begins to fall off at once. So if the deoxycortone is not available no result need be expected.

Two cases of rheumatoid arthritis under the care of one of us (G. E. L.) in hospital were treated on the same occasion, the intramuscular injections being given by a nurse. (Until then we had been in the habit of giving our own injections.) In the first of these two cases it was noticed that the injection was given into the outer upper third of the buttock by a vertical stab. In this case there was a good response with loss of pain the full extension of a knee which had had a small *fl* deformity for two years. In the second of these two it was noticed that the deoxycortone injection given diagonally into bunched-up flesh. There wa response whatever. Three days later this second pa was treated again, care being taken that the deoxycor was given intramuscularly. On this occasion there some response, pain was partly relieved, and wal was somewhat easier. The result was not convir but suggestive. Since then one of our patients who previously responded very well has been given deoxycortone subcutaneously, and no response follo

We appreciate that on this scanty evidence it is proven that the deoxycortone must be given into mu and not fat, but it seems probable that the actio altered by the site of the injection. We hope soo have evidence which will decide this point. Meanwhi does seem important that observers should take partic care over the intramuscular injection. It shoul course always be given into the lateral aspect of the th for, as is well known, many injections in the butt go into fatty tissues. We feel that failure to pay s attention to this detail may be the cause of some of incongruities which are arising.

GEOFFREY E. LOXTO
DAVID LEVAY.

London, W.1.

Medicine and the Law

Burns from Unguarded Fires

WRITING on the Prevention of Burns and *Scalds* our issue of July 30, Dr. and Mrs. Leonard Colebr showed how perilous to children are electric and gas f which have no guard to prevent inflammable clot catching alight. At an inquest reported in the *Manche Guardian* of Dec. 13 Mr. Jessel Rycroft, the Manches city coroner, said: "This is the seventh electric fatality I have investigated in the last few months. have already appealed to the authorities to take act and it is time somebody woke up and did somethi about it."

The Wrong Cylinder

On Dec. 6 the Norwich coroner investigated the dea of a 58-year-old man who died after nitrous oxide w administered from a cylinder which was mistaken believed to contain oxygen. At the inquest, accordi to the *Eastern Daily Press* of Dec. 7, a senior surgi registrar said that when he saw the patient, who had perforated peptic ulcer, he decided that immedia operation was necessary. During the operation t sister said that the patient's pulse had stopped. opened the upper abdomen and massaged the hea through the diaphragm; it began to beat again. T perforation was sutured and the incision closed.

The anæsthetist, a junior registrar, said that befo the operation the patient was shocked and showed sig of mild chronic bronchitis. Anæsthesia was begun 5.45 P.M., and induction was uneventful. About 3 minutes before the patient was brought into the operatin theatre the oxygen cylinder became empty; he imm diately turned on what he thought was the spare cylinde which had been renewed by a theatre porter during th previous case. When the patient was brought into th operating-theatre, he was noticed to be cyanosed. "I was placed on the operating table at 6.1. Becomin alarmed at his general condition, I shut off everythin except what I thought to be the oxygen supply an administered artificial respiration, but within one and half minutes the heart failed. I found out that wha I thought to be a cylinder of oxygen was in fact nitrou oxide. This was at once remedied."

Notes and News

AN AMERICAN VIEW

October Dr. Willard C. Rappleye, professor of medical in Columbia University, New York, made an study of the British health service. In a report to h Macy jun. Foundation, he remarks on "the spirit of coöperation and the earnest efforts of the the hospital authorities, the local authorities, the boards, the Ministry, and the public to implement Service in a manner satisfactory to all concerned." In National Health Service the broad programme of pre- medicine has been handicapped by the greatly d remuneration in the clinical services. "Perhaps the serious difficulty at the present time is the reduction in number of full-time medical and dental officers because of increased opportunities and rewards of specialist, con- t and hospital staffs. This has been reflected in the reduction in the number of students enrolled in of Public Health, for example." As regards general rs, there has been a certain reduction in the and incentive for self-development, and a loss of for some: "the conscientious practitioner, can render very much more satisfactory services previously, although he is handicapped by the avy demands on his time for certificates, reports, and scriptions."

Most people consulted by Professor Rappleye believed that supply of doctors was adequate for the population, but he distribution of physicians "is quite faulty in some areas." The number and quality of men seeking to study medicine, he was informed, have not changed since the service started. Every medical-school authority consulted was of the opinion that practically all students intend to try to qualify r specialist status. "However, since only about one- ard of the physicians completing their registrarships can pect to obtain appointments as consultants . . . it is pected that the economical and professional pressure will ter increase sufficiently to persuade many recent graduates go into general practice. As soon as all available consultant tions are filled the number of such posts vacated annually y be 20% or even less of the output of medical schools." found general agreement that the service is operating "on asonably satisfactory basis under all the circumstances in at Britain, including particularly the serious conditions of national economy. . . . The real test of the National alth Service is ahead. Its future will be determined not doctors, medical schools, or hospitals but by the over-all nomic, social, and financial condition of the Nation."

THE RADCLIFFE CODE

HOUSEMEN and registrars at the Radcliffe Infirmary, ford, have been provided with some bedside reading in e new "handbook," designed, the Regius Professor of dicine says in his foreword, to tell them "how to do ngs, where to get things, who is who, and what is what." s it does, especially the last; for after some historical tes and a list of the staff it turns at once to the by-laws d instructions. "Each Registrar and Resident House ficer" says the first, "shall receive from the Administrator copy of this Handbook when he enters upon his duties, shall acknowledge its receipt by signing the book provided hat purpose." The newcomer is then directed to give his ble attention to his work for the Infirmary; told who dismiss him, what he must do if he wants permission eep out, and how many guests he can have to dinner; is (very properly) required to join a medical protection iety. These peremptory rules of conduct mastered, the ung house-officer and the slightly older registrar may n for solace to the pages which follow. They will find it, —not because the style is any more conciliatory, but ause the matter is so good. The chapter on note-taking uld be redundant if the houseman has been properly ined as a student; but this aspect of his work is often glected by his busy seniors, and he may never have acquired e necessary good habit. The detailed instructions given re should make his notes a model. A description of the llection of specimens for the clinical pathology and the hemical laboratories follows, and there is a short chapter the preparation of patients for X-ray procedures. A few tes on the anæsthetics department, the dispensary, and ne miscellaneous topics end a book which is packed with ful stuff but would be improved, we think, by putting the instructions and by-laws last. After all, even housemen are human, and registrars are only a little lower than the angels.

FOR THOSE ENGAGED IN SOCIAL WORK

SINCE the war ended, laws have changed so much and social services grown so much that the National Council of Social Service have been obliged to revise their handbook[1] completely. The new edition has been planned to form a companion volume to *Voluntary Social Services*, the second edition of which appeared last year. The handbook gives a great deal of useful information about public health and social services, housing, child care, education, amenities (such as parks, civic restaurants, art galleries, and broadcasting), industrial services (including the employment of the disabled), town and country planning, war pensions and allowances, the work of the courts of justice, the juvenile courts, the probationary system, and the prison service. Occupational diseases seem somehow to have slipped out of the net; but otherwise the handbook is thorough and informative, and every social worker will want a copy.

TRIBUTE TO DR. WILFRED HARRIS

A SPECIALLY pleasant function took place on Dec. 12 at Claridge's Hotel when a party of sixty assembled to do honour to Dr. Wilfred Harris on his 80th birthday. The party consisted of members of the staffs of St. Mary's, the Maida Vale, and the National Hospital, and there were many old house-physicians and registrars of Dr. Harris present. After the reading of a poem of praise by Mr. Zachary Cope, tributes were paid to the guest of the evening by Dr. Gordon Holmes, F.R.S., Dr. F. M. R. Walshe, F.R.S., Dr. Russell Brain, and Lord Moran; and the standard of postprandial oratory was very high. Dr. Harris in reply dwelt on his early days in neurology and his association with great figures of the past such as Hughlings Jackson, Charlton Bastian, and Victor Horsley. The evening terminated with a presentation of a set of Elizabethan spoons to the guest, who revealed himself as expert in antique silver as in matters neurological. The assembled company departed with a yearning to reach the age of 80 possessed of the same clarity of mind and activity as that of their guest.

FULBRIGHT TRAVEL GRANTS

THE United States Educational Commission in the United Kingdom offer these travel grants to citizens of the United Kingdom and Colonies to go to America for an academic or educational purpose, such as study, research, or lecturing. Applicants must have a guarantee of financial support in dollars in America for their stay; undergraduate and post-graduate students must show proof of admission to an American institution of higher learning, and all applicants, whatever their programme in America, must be definitely affiliated with such an institution. But applications may be made by candidates who have not yet concluded the above financial and institutional arrangements, and in certain rare cases of exceptional merit the commission will try to help obtain dollar support or institutional connexion. Preference will be given to candidates who intend to stay nine months or more, but applications for shorter periods from well-qualified persons who cannot be spared from their present activities for so long will be accepted. Grants cannot be given for attendance at conferences alone. These grants are available for travel to America between June 1, 1950, and May 31, 1951: they will cover the cost of return rail and steamship fares between the candidate's home in the United Kingdom or Colonies and the destination point in America. Further particulars may be had from the commission, 55, Upper Brook Street, London, W.1.

CONVALESCENT HOMES

EARLIER this year regional boards were asked to undertake, in association with local health authorities, a survey of all untransferred convalescent homes, with a view to their allocation for use either by the board or by the local health authority. As a result of consultations between the Ministry of Health and the County Councils' Association and the Association of Municipal Corporations, these arrangements are to be modified. Boards are now asked to undertake, instead, only a fact-finding survey of the untransferred homes, placing them in the following broad categories:

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1. Public Social Service: Handbook of Information on Services Provided by the State. 8th ed., 1949. Pp. 128. Cloth 7s. 6d., paper 5s. Published by the National Council of Social Service, 26, Bedford Square, London, W.C.1.

Grants to Medical Students

In answer to a question Mr. GEORGE TOMLINSON stated that the Ministry of Education was prepared to consider extending, for a period of 6 months in the first instance, an award under the Further Education and Training Scheme to a medical student appointed to a resident post in order to supplement his salary if the circumstances justified it.

Dr. S. SEGAL: Could not newly qualified doctors be encouraged to undertake posts as trainee practitioners with doctors in general practice while waiting for their hospital appointments?

Education of Handicapped Children

In reply to a question Mr. TOMLINSON stated that since Jan. 1, 1946, 53 boarding special schools, exclusive of hospital schools, had been opened with accommodation for 3300 pupils, and he estimated that 30 more, with accommodation for about 1500 pupils, would be provided by the end of 1950. During the same period, 39 new boarding homes with accommodation for 917 pupils had been approved. No new training centres for handicapped persons had been provided under the Education Acts, and no additional provision was expected next year. The training facilities provided by the Ministry of Labour under the Disabled Persons (Employment) Act, 1944, were available for handicapped pupils when they left school.

Employment of Epileptics

In answer to a question Mr. GEORGE ISAACS stated that at Oct. 17, 1949, there were 14,370 epileptics registered as disabled persons of whom 1732 were unemployed. Epileptics, if suitable for ordinary employment, were eligible for all the training facilities provided for disabled persons, at Government training centres, at technical colleges, and with employers. If they required sheltered employment they could obtain training and work in 'Remploy' factories.

Smoke Abatement

Mr. A. R. BLACKBURN asked the Minister of Health to what extent local authorities during the past five years had taken powers to control and reduce smoke pollution of the atmosphere in the areas for which they were responsible; and what steps were being taken by him to promote further progress in this matter.—Mr. A. BEVAN replied: 8 local authorities have taken powers to establish smokeless zones, 17 to control the emission of smoke from new furnaces, 18 to provide district heating: the City of London has taken power to extend its by-laws for regulating smoke. I have asked all local authorities who are installing solid-fuel appliances in their new houses to select those of improved types which will burn smokeless fuel and I have approved a small number of experimental district-heating schemes.

Obituary

THOMAS ALBERT HINDMARSH

M.S. DURH., F.R.C.S.

Mr. T. A. Hindmarsh, surgeon to the Royal Victoria Infirmary, Newcastle upon Tyne, died on Dec. 8 at the age of 60.

He graduated M.B. with honours from the University of Durham in 1911 and he held house-appointments at the Royal Victoria Infirmary under Rutherford Morison before serving throughout the 1914–18 war. After a period in general practice in Cumberland he returned to Newcastle where he settled in consulting surgical practice. In 1919 he took the M.S. with first-class honours and in the same year he obtained the F.R.C.S. He joined the staff of the Royal Victoria Infirmary to serve as assistant surgeon first with R. J. Willan and later with Professor Grey Turner. He was also on the staff of the Whickham Cottage Hospital, Hexham War Memorial Hospital, Alnwick Infirmary, and the Palmer Memorial Hospital, Jarrow.

G. A. M. writes: "'T. A.' or 'Thomas Albert,' as he was called, personified the Northumbrian approach to surgery. Without showmanship or eloquence, perhaps at times somewhat naive, he was yet well able to take a full and useful part in surgical discussions. Indeed on occasion, drawing upon his vast experience, he could do so with devastating effect. His contribution to the discussion on toxic goitre at the Oxford meeting of the Association of Surgeons stole the show and was virtually a personal triumph. He did a tremendous amount of hospital work, besides having a large private practice; but, despite these distractions he was an omnivorous reader of current surgical literature and an enthusiastic member of a surgical travelling club. His work was always up to date and his theatre drew many visitors. It is especially sad that he should die just when he was rearranging his life to devote himself to the more academic side of surgery and place the benefit of his experience at the disposal of those now being trained. Universally popular, a keen golfer and fisherman, and with an enormous fund of good stories, he had a host of friends and almost certainly no enemies. Although I was not a close personal friend I feel impelled to record this appreciation because T. A., typically, once went out of his way to help me to start in a branch of surgery in which he himself was not entirely disinterested. Such actions account in part for the great affection in which he was held and because of which he will be remembered by many."

His old chief, G. G. T., adds: "Albert Hindmarsh was a good sound general surgeon with a very wide knowledge of the art. Though his tastes were far too catholic to be limited to any one branch of work for years he had done a great deal in caring for toxic goitre in which he had a very large experience and in which he was particularly successful. He was always cheerful and optimistic and devoted to his patients. Of recent years he often seemed to be called upon to operate on professional friends and he was widely trusted. A hard worker, he was never reluctant to undertake new duties, and his activities covered a wide area in the North Country. He was a loyal colleague and fast friend. Quite recently he had been appointed as examiner in the final fellowship, but alas he had not yet taken his place on the court when he died.

Dr. JUSTINA WILSON

IT was a fortunate chance that, owing to her husband's early retirement from work in India, Dr. Justina Wilson returned to England. After travelling widely in Europe and studying physiotherapy in Germany and Sweden, she founded her school of massage in Baker Street about 1909. Later she fused this with the Swedish institute in Cromwell Road, which had been founded by Dr. Mary Hawkes, who herself was a pioneer in introducing Swedish methods of physical medicine into this country. Dr. Wilson thus became connected with [illegible] the Royal Free, and, later, St. Mary's [illegible] When she found the lack of a medical qualification impeding her beloved work, she started as a medical student and qualified in 1916. At this time she was directing the Swedish institute, and she had started in private practice—truly a task that would have daunted most people.

She was always young in mind, ready to try any new ideas in her work, though a staunch Conservative in her politics. Her reputation was international and she was consulted widely by clinicians abroad. Each year she tried to spend some time travelling in Europe, and on these journeys bought any piece of apparatus or new gadget which appealed to her as likely to help her work. She was a pioneer of—among other things—short-wave pelvic diathermy, especially for patients suffering from chronic inflammatory states and sterility. This led her to study and practise endocrine therapy, which she always tried to base firmly on scientific data since she considered that this subject was open to "quackery."

Her private practice was very wide in its scope, especially during recent years, and she brought to the relief of her many patients a wide experience, an expert knowledge, and an immense fund of kindness and sympathy. She did not suffer fools gladly and had a caustic tongue with a flow of language that was presumably derived from her Irish ancestors. Dr. Wilson was essentially an individualist in her methods of treatment and in her acceptance or rejection of current ideas; but she constantly disclaimed anything that appeared to her sham or merely expedient.

During the late war she worked excessively long hours in London, and each weekend journeyed down to Eastbourne to spend a short time with her invalid husband; it was only after his death in 1948 that her will to work and live diminished.

G. M. S.

TEMPOROMANDIBULAR ARTHROSIS *

JENS FOGED
M.D. Copenhagen
FORMERLY PROFESSOR OF SURGERY IN THE DENTAL SCHOOL OF COPENHAGEN

A SURGICAL lesion of the temporomandibular joint that the practitioner is likely to meet fairly often and of which we have had considerable experience in our department is temporomandibular arthrosis. The clinical picture seems to have been but relatively little known until recently, owing to the slight interest shown by pathologists in the temporomandibular joint compared with that shown in other joints, though functionally the temporomandibular joint is one of the most important joints in the body, playing a chief rôle in the intake of food and hence in the general physical condition.

This lesion is usually called temporomandibular cracking, snapping joint, machoire à ressort, or Kiefergelenkknacken, which names, however, denote only one of the symptoms. I have established (Foged 1941a, b, and c) that the cracking of the temporomandibular joint and accompanying clinical features are due to arthrosis—a degenerative non-infectious condition—and that the cracking (or snapping) is merely one of several symptoms in the more serious cases. In 1940 I suggested that the disease be called arthrosis temporomandibularis, which name covers its ætiology, pathogenesis, pathological anatomy, and symptoms. So far as I know, this name has not been criticised, and it has been adopted by Nørgaard (1947) and Boman (1947).

The lesion seems to have been described first by Sir Astley Cooper in 1823, and the first account of its surgical treatment was by Annandale (1887), who reported two successful cases of fixation of the meniscus. Much has been published on this subject since then, perhaps the most important being by Axhausen (1931), Boman (1947), Dufourmentel (1929), Konjetzny (1921, 1929), Posselt (1945), and von Stapelmohr (1929). The chief histological descriptions are those of Bauer (1932) and Steinhardt (1933, 1934); and Nørgaard (1947) has described temporomandibular arthrography.

MATERIAL

My material comprises 94 patients, with 138 instances of temporomandibular arthrosis, admitted to our department within the last nine years. These figures give an exaggerated impression of the frequency of the lesion, because most of the patients with temporomandibular arthrosis in this area are treated here or in the Rigshospital.

ÆTIOLOGY

Age and Sex

The lesion was found mostly in persons aged 20–30 years, and more often in women than in men. The distribution was as follows:

Age (years)	*No. of patients*	*Bilateral lesion*
<10	0	0
10–20	20	9
20–30	39	20
30–40	14	6
40–50	10	3
50–60	5	3
60–70	4	1
70–80	2	2
Total	94	44

Of these 94 patients, 17 were male and 77 female.

Duration

The disease is usually a protracted and chronic one. In 42 cases the onset was 2–14 years before admission: in 126 cases the duration was as follows:

Duration (years)	*No. of cases*
<$^1/_2$	37
$^1/_2$–1	20
1–2	27
2–3	12
3–4	8
4–5	5
5–10	7
10–14	10
Total	126

The ætiological factors are direct or indirect mechanical injuries. The direct injuries are acute mechanical trauma, such as a blow on the temporomandibular joint or on the mandible. The indirect injuries are repeated or chronic, such as protracted or forced yawning, subluxations and luxations, displacement of the bite (dental or prosthetic), dysfunction and hyperfunction (e.g., grinding and clenching of the teeth, and habitual or occupational strain on the teeth), disorders of articulation (e.g., obstruction to gliding movements, locked articulation, cross-bite, and forced bite), and unilateral function with either normal or reduced height of the bite.

It will be seen that the pathogenesis is analogous to that of corresponding forms of arthrosis in other joints. Dysfunction is most often due to anomalies of dental apposition and bite, the effect of which on the joint is transmitted partly during mastication and partly through habitual or nervous hyperfunction of the jaws—e.g., gritting of the teeth, and habitual firm clenching of the jaws (Posselt 1945).

CLINICAL PICTURE

Symptoms

The symptoms, and the number of cases in which they were noted as being present or absent, were as follows:

Symptoms	*Present*	*Absent*
Pain	113	25
Reduction of mobility	87	49
Locked articulation	29	106
Difficulty in mastication	115	22
Cracking, grinding, &c.	113	25

As a rule the patient first notes an oft repeated, but otherwise asymptomatic, cracking in the temporomandibular joint; sooner or later this is followed by pain on movement at the joint, especially on mastication. Gradually the pain becomes worse and is accompanied by reduction of mobility, which at first is usually insignificant, though worse in the morning, when it is difficult to move the joint. Later, the maximal opening of the mouth is reduced, and it becomes increasingly difficult to separate the teeth, with the result that finally the patient can hardly take any solid food, and he tends to become weak and emaciated.

Remote symptoms, which are emphasised especially in the American dental journals, have not been prominent in my material. This may, however, be because it was only after the end of the war, when foreign journals again become accessible to us here in Denmark, that my attention was attracted to such symptoms. The main ones are: headache, migraine, neuralgic pain, and abnormal sensations and disturbances of the ears, nose, mouth, and throat. In only a few of my cases has this multiform symptom complex been so pronounced that the patients complained of it of their own accord.

In some cases the lesion has spontaneously regressed or even disappeared either temporarily or permanently.

Signs

On physical examination a cracking in the joint was often heard. Inspection seldom revealed any abnormality. On palpation there was often tenderness on deep pressure and grating or cracking could be felt in most cases. Reduction of mobility on yawning, with lateral deviation or protrusion of the jaw, is one of the most important signs and was present in various degrees in the great majority of patients. Locking of the joint was observed only once.

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* Read before members of the British Provincial Surgical Club on their visit to Copenhagen.

(*a*) those which provide convalescent treatment within the scope of the hospital service, and may therefore be appropriately used by regional-hospital boards; (*b*) those which provide recuperative facilities of the "holiday home" type, and may therefore be appropriately used by local health authorities; and (*c*) those which are a combination of (*a*) and (*b*). When this information has been obtained consideration will be given, on a national basis, in consultation with the two associations, to the question whether there should be any, and if so what, allocation of convalescent homes or beds between regional boards and local health authorities. For the purpose of the regional review, boards are asked to invite the council of the county or county borough in which each convalescent home is situated to nominate one or two representatives to join the board's officers in the survey of it.

University of London

At a recent examination for the diploma in psychological medicine the following were successful:

Eric Brenman, William Calder, D. H. Clark, J. A. Ewing, Joan I. Hallinan, Julius Hönig, Solomon Jacobson, J. M. Macdonald, J. H. McDougall, D. F. Macgregor, Secundus Mansvelt, J. D. Morrissey, Clement Rose, Lotte Rosenberg, I. M. Shepherd, Mohammad Shuaib, R. L. Sikes, R. J. Stanley.

Dr. A. C. Dornhorst has been appointed to the readership in medicine at St. Thomas's Hospital medical school, Dr. W. H. Hughes to the readership in bacteriology at St. Mary's Hospital medical school, Mr. Jack Joseph to the readership in anatomy at Guy's Hospital medical school, and Dr. R. B. Lucas to the readership in pathology at the Royal Dental Hospital. The title of reader in pharmacology and therapeutics has been conferred on Dr. C. A. Keele in respect of his post at the Middlesex Hospital medical school.

The following teachers have been granted recognition as teachers:

R. S. Lewis, oto-rhino-laryngology, Mary J. Wilmers, children's diseases, King's College Hospital; J. A. Hobson, mental diseases, Ian Jackson, obstetrics and gynæcology, Middlesex Hospital; Frances Gardner, medicine, Gladys Hill, obstetrics and gynæcology, George Qvist, surgery, Royal Free Hospital; A. G. Cross, [illegible] H. Morris, anæsthetics, St. Mary's Hospita[illegible] ntal surgery, J. W. Schofield, dental surgery, [illegible] Hospital; Gerald Garmany, mental diseases, [illegible] School.

The following have been granted probationary recognition for two years from October, 1949:

A. M. Horsnell, dental surgery, London Hospital; S. J. Holt, organic chemistry, J. B. Jepson, biochemistry, D. G. O'Sullivan, chemistry, Middlesex Hospital; A. G. Stansfield, pathology (morbid anatomy), Royal Free Hospital.

The John Marshall fellowship in surgical pathology, of the value of £700 a year tenable at University College Hospital medical school, has been awarded to Mr. B. B. Milstein, F.R.C.S.

Aureomycin and Chloromycetin Centres in Scotland

The Scottish regional hospital board centres for the distribution of 'Aureomycin' and 'Chloromycetin' are as follows:

Region	*Distribution centre*	*Tel. no.*
Northern	The Medical Superintendent, Raigmore Hospital, Inverness.	Inverness 681
North-Eastern	Dr. J. Smith, City Hospital, Aberdeen.	Aberdeen 2242
Eastern	Dr. W. Jamieson, King's Cross Hospital, Dundee.	Dundee 85211
South-Eastern	Tl[illegible]	Edinburgh 30271
Western	Tl[illegible] Glasgow.	Glasgow Central 9600

For the present the use of these drugs is restricted to certain conditions, which were listed in our issue of Nov. 19 (p. 955).

London County Medical Society

The annual general meeting of the society will be held at St. Giles' Hospital, Camberwell, S.E.5, on Wednesday, Jan. 4, at 3.15 P.M., when Dr. C. D. S. Agassiz will give an address.

U.S. Air Force Appointments

Major-General Harry G. Armstrong has succeeded Major-General Malcolm C. Grow as surgeon-general of the U.S. Air Force. Brigadier-General Dan Clark Ogle becomes deputy surgeon-general.

Poliomyelitis

During the week ended Dec. 10, notifications in England and Wales numbered: poliomyelitis 124, and polioencephalitis 10. In the previous week the totals were 141 and 15.

Royal Appointment

Dr. R. Bodley Scott has been appointed physician to His Majesty's Household in place of Dr. D. T. Davies, who was recently appointed physician to the King.

Presentation of Nobel Prize

In Oslo on Dec. 10 Lord Boyd-Orr, F.R.S., received the insignia and diploma of the Nobel peace prize. Afterwards he announced that he would use the award of £7815 to help in establishing in London a house where peace organisations could carry on their work.

Bulgaria Withdraws from W.H.O.

The government of Bulgaria has announced its withdrawal from the World Health Organisation. The U.S.S.R., Byelorussia, and the Ukraine withdrew last February. Up till now sixty-seven countries have ratified the W.H.O. constitution.

M.R.C. Staff Televised

Dr. P. L. Mollison, director of the blood-transfusion research unit of the Medical Research Council, and Dr. Margaret Mackay took part in a television programme on blood on Dec. 12. The programme included a short film sequence, taken for the broadcast by Dr. Brian Stanford, showing the use of fibrin foam in an operation for cerebral tumour.

Cryogenine, which was the subject of an article last week, by Geoffrey Bourne, is supplied as 'Cryogénine' (Lumière) by the Anglo-French Drug Co., Ltd., 11, Guilford Street, London, W.C.1.

Appointments

ALERGANT, C. D., M.B. Lpool, M.R.C.P.: consultant venereologist, Liverpool region.

BLACK, JAMES, M.D. Glasg., F.R.F.P.S., M.R.C.P.: medical director, no. 2 mobile mass-radiography unit, and asst. chest physician, Liverpool region.

DALZELL-WARD, A. J., M.R.C.S., D.P.H.: senior asst. M.O., public-health dept., Berkshire County Council.

MCCARTHY, MICHAEL, M.B. N.U.I.: deputy regional blood-transfusion officer, Liverpool.

Colonial Service:

BALLETTO, G. M., M.D. Genoa: M.O., Tanganyika.
CLARK, E. M., M.R.C.S., D.T.M. & H.: senior M.O., Kenya.
EDDY, T. P., B.A. Oxfd, M.R.C.S.: senior M.O., health, Sierra Leone.
GERBER, J. H., M.D. Berlin: M.O., Sierra Leone.
GOSCINSKI, ANTONI, M.D. Poznan: M.O., British Honduras.
GURD, C. H., M.B. Brist.: M.O., Nyasaland.
LANGWILL, A. M., M.B. Edin.: M.O., Nigeria.
MATHEWS, T. C. H., M.R.C.S.: M.O., Kenya.
QUIN, W. M., M.A., M.B. Edin., F.R.C.S.E., D.T.M. & H.: senior specialist, Sierra Leone.
SARKIES, J. W. R., M.R.C.S.: temporary ophthalmologist, Gold Coast.
SCOTT, D. B., M.B. Edin.: M.O., Gold Coast.
TILLMAN, JOHN, M.B. Edin., D.T.M. & H.: senior M.O., Nyasaland.

Births, Marriages, and Deaths

BIRTHS

CONWAY.—On Dec. 7, the wife of Dr. D. J. Conway—a daughter.

GARAI.—On Dec. 11, in London, the wife of Dr. Oliver Garai—a son.

IRVINE.—On Dec. 13, in London, the wife of Dr. R. E. Irvine—a daughter.

LEGGATT.—On Dec. 11, at Goring-by-Sea, the wife of Dr. H. D. Leggatt—a son.

READ.—On Dec. 12, in London, the wife of Dr. N. P. Read—a son.

RICHARDS.—On May 30, at Saskatoon, Saskatchewan, Canada, to Dr. Elizabeth Richards, wife of Dr. A. G. Richards—a son.

ROSS.—On Dec. 9, the wife of Dr. D. N. Ross—a daughter.

WOOD.—On Dec. 10, in Sheffield, the wife of Dr. Derek Wood—a daughter.

DEATHS

BRIERLEY.—On Dec. 8, at Ramsey, Isle of Man, Edward Edelsten Brierley, M.B., C.M. Edin., F.R.C.S.E., aged 77.

CAINE.—On Dec. 12, at New Ferry, Cheshire, Nathaniel Caine, M.D., C.M. Edin.

CHAMPION.—On Dec. 13, at Framfield, Sussex, Selwyn Gurne Champion, M.D., C.M. Edin.

ELLIOTT.—On Nov. 28, at Sea Point, Cape Town, Charles Caldwell Elliott, M.D. Lond., aged 83.

HIRD.—On Dec. 11, Alan James Hird, M.B., B.Sc. Glasg., M.R.C.P. [illegible]

MACKESSACK.—O[illegible] Peter MacKessack, D.S.O., M.B., [illegible]d, aged 77.

STEPHEN.—On D[illegible] George Stephen, M.B. Aberd., F.R.C.S.E., aged [illegible]

WEBB.—On Dec. 10, at Brighton, Frederick Henry Webb, M.B., B.Sc. Edin., aged 50.

lications

The only complication following surgery in our material was facial paralysis, which developed in 10 cases, but it was only partial and transient.

RESULTS

The results of surgery, as established by follow-up examination of 33 patients (41 cases), were as follows:

Good result	.. ..	32 cases
Improvement	.. ..	7 ,,
Unchanged	.. ..	2 ,,
Total	..	41

The follow-up period varied from six months to eight years; for 27 patients it was at least a year. "Good result" means that the patient is symptom-free, mobility of the jaw free, and mastication unhampered, though there may still be some cracking which does not inconvenience the patient. "Improvement" means that the patients are still not quite symptom-free.

The ability to open the mouth wider after the operation is illustrated in fig. 2.

Since the cases included here were severe, these results may be said to be satisfactory. Similar good results of surgery have been reported by Boman (1947) among others.

As a rule, the scar after the operation is visible but very small.

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". . . If the world's governments will give one-hundredth part of the money they are using for war preparation to the specialised agencies of the United Nations, obstacles to peace will vanish. The United Nations is a better organisation than the old League of Nations, but its specialised agencies lack authority and funds. If the sixty governments which adhere to these would agree to devote to them one unit of their currency for every hundred they are devoting to preparation for war, and allow them freedom of action, I venture to predict that within a few years the political issues which divide nations would become meaningless and the obstacles to peace disappear. . . . The nation or group of nations which will make a great new gesture of friendship and an offer to collaborate with all governments in a simple and concrete world plan to development would win the allegiance of the people of all countries, who are sick to death of political conflict and preparation for war. The government which is strongest and surest of itself is the one which should take the lead in this road to peace. Any who refused to collaborate could be ostracised from the family of nations until they were willing to put the welfare of all before their own selfish interests. . . . Let there be less talk of war which inspires fear and panic and more talk of the great new age struggling to be born."—Lord BOYD-ORR, M.D., F.R.S., when receiving a Nobel peace prize in Oslo

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A COMPARISON OF THE ANTI-THYROID ACTIVITY OF PARA-AMINOBENZOIC ACID AND THIOURACIL COMPOUNDS

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para-Aminobenzoic acid (P.A.B.) was first considered as a possible anti-thyroid agent soon after Mackenzie and Mackenzie (1943), Mackenzie (1947), and Astwood et al. (1943) had shown that it inhibited the function of the thyroid gland in rats. Gordon et al. (1945) showed that P.A.B. increased the weight and lowered the oxygen consumption of the thyroid gland in rats. Franklin et al. (1944), using surviving thyroid slices from sheep, demonstrated that P.A.B., thiourea, and thiouracil depressed the conversion of radioactive iodine to radio-thyroxine and radio-di-iodotyrosine at a concentration of 10^{-3}M.

Though the results of experiments on animals suggest that P.A.B. might prove effective in the treatment of thyrotoxicosis, only three reports of its use for this purpose in clinical practice have been published: Berman (1945) claimed good results in 6 cases treated by injection, and Popp (1947) gave P.A.B. by mouth with success in 4 patients, though Williams (1947) reduced the basal metabolic rate (B.M.R.) in only 2 out of 8 patients so treated.

PRESENT INVESTIGATION

A drug which would be as effective as the thiouracil group without displaying their toxic effects would be of great value. It was therefore decided to compare P.A.B. with thiouracil drugs in a few cases of thyrotoxicosis, and to use radioactive iodine to assess the relative efficacy of the two groups of drugs in normal people by the method of Stanley and Astwood (1947).

Preparation of P.A.B.—The sodium salt of *p*-aminobenzoic acid (Na P.A.B.) was prepared according to the following prescription:

Sodium hydroxide	..	40 g.
P.A.B.	..	137 g.
Essence of lemon	..	21 ml.
Chloroform water to	..	80 fl. oz.

This mixture, which is quite palatable, contains 1 g. of Na P.A.B. in each $^1/_2$ oz. dose.

Method.—Ten patients were treated with P.A.B. by mouth for periods varying from three weeks to nine months. All received 4 g. a day except case 6, who received 8 g. a day. All the patients, except case 5 who defaulted, were treated with thiouracil compounds (2 with propyl thiouracil and 7 with methyl thiouracil). The duration of thiouracil treatment varied from six weeks to two years except in case 9, who developed leucopenia after five days' treatment and cannot be considered a valid case for comparison. The dosage was that usually given for maintenance, but rather higher doses than usual were given to cases 1 and 3, who were resistant to the drug.

TOXIC EFFECTS OF P.A.B.

In the late war P.A.B. was used by Yeomans et al. (1944) in the treatment of typhus and was found to be safe in large doses for short periods (4–8 g. initially, A conspicuous and characteristic sign in the unilateral cases is deviation of the chin to the affected side when the patient opens his mouth wide (fig. 1). This sign was present in over half the cases. In about 20% of the cases the muscles of mastication were weak and atrophied on the affected side. The lesion is usually monarticular but may be bilateral. Bilateral lesions, however, seldom develop simultaneously and are rarely of equal severity. There is never any pyrexia.

In sum, the signs are similar to those of arthrosis of other joints.

Investigations

Radiography.—X-ray examination often revealed either structural or topographical pathological changes in the temporomandibular joint: deformities of the capitulum and articular tubercle; irregularities in the contours of the articular surfaces; narrowing of the joint gap; and a sclerotic subchondral marginal zone. This picture was often associated with reduced mobility of the capitulum on radiography during maximal opening of the mouth, and with upward and backward displacement of the capitulum. In many cases, however, the X-ray findings were normal. In many cases valuable information has been obtained from arthrography (Nørgaard 1947).

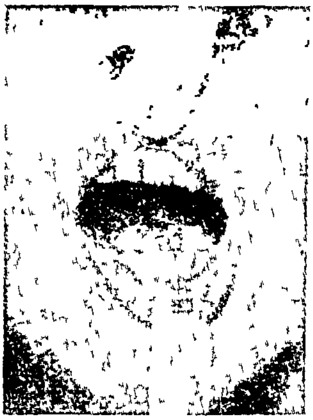


Fig. 1—Left temporomandibular arthrosis in a girl aged 18, showing reduction in maximal opening of mouth, and deviation of chin to left.

Blood Tests.—The Wassermann reaction and the gonococcal complement-fixation test were negative in practically all our cases, and the erythrocyte-sedimentation rate was nearly always normal.

Mastication.—I wish to emphasise the necessity of having the patients examined by a dental surgeon capable of assessing the masticating apparatus, discovering any dental factors which might favour the production of the temporomandibular arthrosis, and suggesting conservative methods for their elimination.

Analysis of Findings

The signs, and the number of cases in which they were found or not found, were as follows:

Findings	*Present*	*Absent*
Audible cracking .	51	83
Swelling, deformity	10	128
Tenderness . .	65	73
Intermediary cracking*	103	35
Terminal cracking*	17	120
Reduction of mobility	83	53
Deviation on yawning	69	64
Muscular atrophy .	27	111
Anomalous bite	111	18
Abnormal radiogram .	81	45

* "Intermediary" and "terminal" cracking occur when the mouth is partly and fully open respectively.

PATHOLOGY

The following changes were found at operation: (1) in many cases the meniscus showed evidence of altered mobility either in abnormal looseness or, more often, in too firm fixation to the capitulum by fibrous adhesions, (2) sometimes the lower joint cavity was more or less obliterated; and (3) the articular cartilage showed macroscopical and microscopical signs of degeneration, sometimes with deformity of the capitulum.

DIAGNOSIS

The symptoms are so characteristic that the correct diagnosis can hardly be missed. In the differential diagnosis only chronic monarticular arthritis may have to be considered, and here the X-ray findings, erythrocyte-sedimentation rate, and antistreptolysin titre will give significant information.

TREATMENT

Dental

Every case of temporomandibular arthrosis should be treated, even if the symptoms are only slight, in the hope of checking its progress. Primarily the treatment should be conservative, and here I strongly recommend measures which aim at restoring the bite to normal. This treatment is entirely dental and consists in prosthetic measures and adjustment of the height of the teeth, &c., to suit each case. Encouraging results have been obtained in our department (Posselt 1945), and similar good results have been published by Goodfriend (1932), Glahn (1932), Krogsgård (1944), Lindblom (1936, 1942), Boman et al (1943), and Miller (1943). This treatment is usually protracted and expensive, and months may elapse before it has any obvious effect. Diathermy, short-wave therapy, or radiotherapy sometimes produces temporary improvement. The pain may require analgesics for its relief.

Surgery

The following are the indications for surgery:

(1) Dental examination has revealed no cause that can be treated by a dental surgeon, or dental and other forms of conservative treatment have failed.

(2) The patient is unwilling or unable to await the outcome of conservative treatment or has no means or opportunity for such treatment.

(3) Progressive limitation of movement or frequent locking of the joint.

(4) The clinical condition, especially its duration, the severity of the symptoms, and the radiological findings suggest irreparable pathological changes in the joint.

Operation

The operation is always performed under local anæsthesia, either regional blocking of the mandibular nerve at the foramen ovale, or, more often, infiltration anæsthesia. I used to employ the preauricular incision of Schuckardt, but for most cases I now favour the Bockenheimer-Axhausen postauricular incision, which gives the surgeon a better view of the field. As a rule the operation consists of extirpation of the meniscus, together with severance of adhesions; sometimes only severance of adhesions is required but in a few cases resection of the capitulum has been necessary.

I have treated 36 patients by operation, in 8 of them the lesion was bilateral, making a total of 44 operations. The bilateral cases were always dealt with in two operations separated by a considerable interval of time

After-treatment

This is the simplest possible—fluid diet and prohibition of mastication for a couple of days, followed by active training of the movements of the lower jaw.

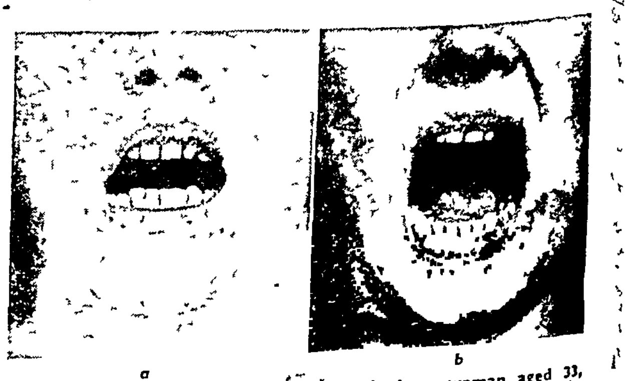


Fig. 2—Right temporomandibular arthrosis in a woman aged 33, showing maximal opening of mouth: a, before operation, b, six years after extirpation of meniscus.

In only 1 case was the response to methyl thiouracil smaller than in the two typical curves shown.

With P.A.B. the usual dose was 4 g. In general the effect of this dose was noticeable but less than that of methyl thiouracil, and did not seem to last so long. Fig. 2 gives three examples of curves obtained with P.A.B.: the uppermost is from a case where 4 g. of P.A.B. had no apparent effect; in the middle one some reduction in the rate of iodine retention is seen; and in the lowermost, with 6 g. of Na P.A.B., the take-up was completely suppressed after 72 minutes.

Most of the curves were of the form shown in the middle tracing of fig. 2, where there is a discontinuity in the straight line but where one can draw some kind of straight line through the experimental points after the break. The slope of the straight line obtained in these curves is, for a particular patient, proportional to the clearance-rate of the thyroid for the plasma-iodine. We have therefore tried to estimate the ratio of the clearance-rate before and after P.A.B. produces an effect. In 8 people given 4 g. of P.A.B. the clearance-rate with the drug was on the average half the clearance-rate without the drug. In 9 people given methyl thiouracil the clearance-rate was on the average reduced to 0·2 of the original clearance-rate.

These figures are approximate but suggest that 4 g. of Na P.A.B. produces a smaller anti-thyroid effect than does 200–300 mg. of methyl thiouracil.

Stanley and Astwood (1947) made a very comprehensive survey of some thirty-two anti-thyroid drugs, using 90 patients. They attempted a relative classification of those drugs by assigning them to one of five groups giving different degrees of inhibition, and by comparing the weights of drug necessary to give roughly the same degree of inhibition.

Our own results represent more tests for a given drug than were used by Stanley and Astwood. The curves of figs. 1 and 2 illustrate the wide range of effects produced by a given drug in the group of patients tested. We have therefore attempted a greater division of the observed degrees of effectiveness by assigning a number between 0 and 10 to each test according to the degree of effectiveness observed. For example, the group marked 0 shows complete absence of effect, group 6 shows suppression of take-up for the full time of the observation, and group 10 shows a substantial reduction in gland activity after the administration of the anti-thyroid drug.

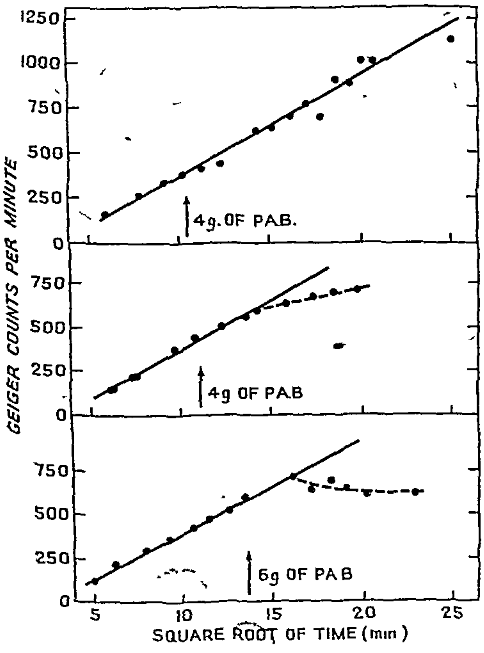


Fig. 2—Effect on accumulation gradient in thyroid gland of: (upper tracing) 4 g. of P.A.B.; (middle tracing) 4 g. of P.A.B. in another patient; and (bottom tracing) 6 g. of P.A.B.

COMPARISON OF POTENCY OF Na P.A.B. AND METHYL THIOURACIL

Drug	Dose	Degree of response										
		0	1	2	3	4	5	6	7	8	9	10
Methyl thiouracil	200 mg.	..	..	..	× ×	..	..	×	..	×	..	..
Methyl thiouracil	300 mg.	..	..	×	..	..	×	..	..	..	×	× ×
Na P.A.B...	4 g.	×	..	× × ×	×	×	..	..	×	..	..	..
Na P.A.B...	6 g.	..	..	..	..	..	..	..	×	..	..	..

Each × represents one subject tested.

In the accompanying table are set out the results of all the seventeen tests made, classified in this manner. This again illustrates our conclusion that 200–300 mg. of methyl thiouracil is substantially more effective than 4 g. of P.A.B. in depressing the iodine uptake of the gland.

CONCLUSIONS

The results of the clinical tests, and the evidence obtained by the tracer technique in normal persons, seem to show that P.A.B. has a definite anti-thyroid action, probably sufficient to influence mild or moderate degrees of thyrotoxicosis but significantly less than that of the thiouracil compounds. Patients with more severe grades of thyrotoxicosis are unlikely to be improved unless toxic doses are given. It should be remembered that methyl thiouracil has only one serious side-effect—agranulocytosis—whereas P.A.B. has at least three potentially serious side-effects—depression of the bone-marrow, renal damage, and fatty infiltration of the liver.

SUMMARY

The experimental and clinical evidence suggesting an anti-thyroid action of the sodium salt of *para*-aminobenzoic acid (Na P.A.B.) is briefly reviewed.

Thiouracil compounds were found to be more effective than P.A.B. in a clinical trial, though this showed that P.A.B. has some anti-thyroid action. Of 10 thyrotoxic patients treated with P.A.B. 6 did *not* respond at all, and in only 1 was full control obtained; there were no toxic effects. When 8 of these patients were treated with thiouracil compounds full control was obtained in 3, and only 2 did not show any response.

The technique described by Stanley and Astwood (1947) was used to compare the effectiveness of Na P.A.B. with that of methyl thiouracil in suppressing the uptake of radio-iodine into the thyroid glands of people with normal thyroid function. By this method a single dose of 200–300 mg. of methyl thiouracil was found to be substantially more effective in reducing iodine uptake than a single dose of 4 g. of Na P.A.B.

It is concluded that Na P.A.B. has a slight but definite anti-thyroid action in safe dosage (4 g. a day); but to obtain an action comparable to that of the thiouracil group toxic doses would be necessary. It is suitable only for the treatment of mild cases of thyrotoxicosis.

Thanks are due to Mr. G. Blomfield, F.R.C.S., for his cooperation; Miss L. Fearn for technical assistance with the Geiger-counter measurements; and Mr. J. Bowen for the construction of the counter housing and stand.

References at foot of next page

followed by 2 g. two-hourly). Depression of the bone-marrow and renal damage were thought to be possible complications. Zarafonetis et al. (1948) found that P.A.B. in high concentration inhibited all phases of granulocyte development in 10 cases of chronic myeloid leukæmia. Their patients received Na P.A.B. 2–4 g. two-hourly, and blood-P.A.B. levels were kept at 10–30 mg. per 100 ml. All the patients had glycosuria, and glucose-tolerance studies in 2 of them showed that their renal thresholds for glucose were lowered, suggesting that P.A.B. may interfere with renal phosphorylation. The same workers reported a death from toxic hepatitis in a boy of 4 years with subacute disseminated lupus erythematosus who was receiving 8 g. daily. May and Vallance-Owen (1948) treated 5 cases of myeloid leukæmia with P.A.B., and noted a profound fall in the total leucocyte-count and a tendency to hæmorrhage, the latter being attributed to leukæmic infiltration into the walls of small vessels, which were subsequently damaged by P.A.B.

Cruickshank (personal communication) has described the necropsy findings in 3 children treated with large doses of P.A.B. for acute rheumatism. Apart from the pathological changes due to acute rheumatism, gross fatty infiltration was found in the liver in each case. The treatment had lasted up to three weeks, and P.A.B. 1–3 g. had been given two-hourly, the blood-P.A.B. level occasionally rising above 45 mg. per 100 ml. The mode of death seems to have been what would be expected from acute rheumatism, but there seems to be little doubt that the fatty infiltrations were due to P.A.B., since identical changes were found in rabbits treated with large doses of P.A.B. by Cruickshank and Mitchell (1949).

In our cases no toxic effects were noted. In view of the higher dosage used in case 6, the bone-marrow was examined before and after treatment. Daily white-cell counts, alkali-reserve estimations, and examinations of urine were also done on this patient. No abnormality was detected in any of these tests during or at the end of treatment. It therefore seems that in moderate dosage (up to 8 g. a day) for short periods Na P.A.B. is safe, but that in larger doses it may be dangerous.

RESULTS OF CLINICAL TRIALS

In assessing the efficacy of the treatment four grades have been adopted:

O, no improvement.

+, slight improvement—i.e., slight general diminution of all toxic signs, or well-marked improvement in at least two signs.

++, great improvement in all signs and symptoms, but not complete control.

+++, complete control.

Subjective improvement alone has not been counted as evidence of any clinical control of the disease; the B.M.R. and the blood-cholesterol levels have been used as criteria in the assessment of results.

The results can be summarised as follows:

	Cases on Na P.A.B.	*Cases on thiouracil compound*
No improvement	6	2
Slight "	3	2
Great "	0	1
Full control	1	3
Total	10	8

It will be seen that, with P.A.B., slight improvement occurred in 3 patients, and complete control in only 1. The results with thiouracil were notably better—slight improvement in 2 patients, great improvement in 1, and full control in 3. Two patients were selected for P.A.B. therapy because of toxic reactions to thiouracil. Four patients seemed to be resistant to both groups of drugs: 1 of these had previously relapsed after thyroidectomy, and 1 subsequently relapsed after operation. In more than 100 cases treated with thiouracil and studied by us for from one to four years the incidence of complications necessitating the withdrawal of therapy was 12%, and 2% of the patients were resistant to the drug (Goodwin 1949).

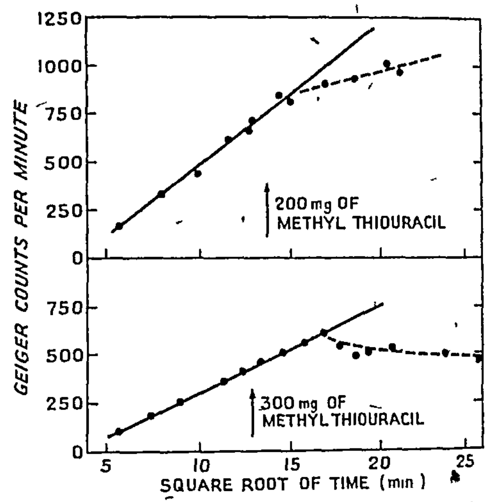


Fig. 1—Upper tracing shows effect on accumulation gradient in thyroid gland of 200 mg. of methyl thiouracil. Lower tracing shows alteration produced by 300 mg. of methyl thiouracil.

ASSESSMENT OF RELATIVE EFFICACY

After these clinical trials, radioactive iodine was used by the method of Stanley and Astwood (1947) to compare the effectiveness of Na P.A.B. and methyl thiouracil in normal people.

The technique is based on the fact that a dose of anti-thyroid drug, administered after a tracer dose of radioactive iodine and during the period when the active material is accumulating in the gland, produces a well-marked effect on the process of accumulation. This effect is an alteration in the shape of the standard build-up curve, and can readily be detected if the curve is plotted as a straight line. Over a limited time this can be done by plotting the activity in the gland against the square root of the time. A straight line results, since the early part of the curve during the build-up period is approximately parabolic. If the anti-thyroid drug is given during the period when a straight-line graph is expected, the effect on the iodine retention in the gland can readily be noted. This straight-line relationship holds for about 10 hours in normal persons, but for only about 3 hours in toxic cases. The latter are therefore unsuitable for this type of investigation.

By this method 19 people were tested. In 2 people the uptake was abnormal and no anti-thyroid drug was given; 1 of these was later found to have received a dose of an iodine compound about three days before the test. One group of people, who were tested with methyl thiouracil, received either 200 mg. or 300 mg. of the drug. It was evident that 200 mg. of methyl thiouracil produced a well-marked change in the capacity of the gland to take up I^{131}. It was in general, however, too small a dose to suppress the take-up entirely. With 300 mg. of methyl thiouracil a greater effect was generally obtained; indeed, some of the curves seem to indicate that there was a real regression of thyroid activity, involving a tipping out into the blood-stream of active iodine previously taken up into the thyroid tissue.

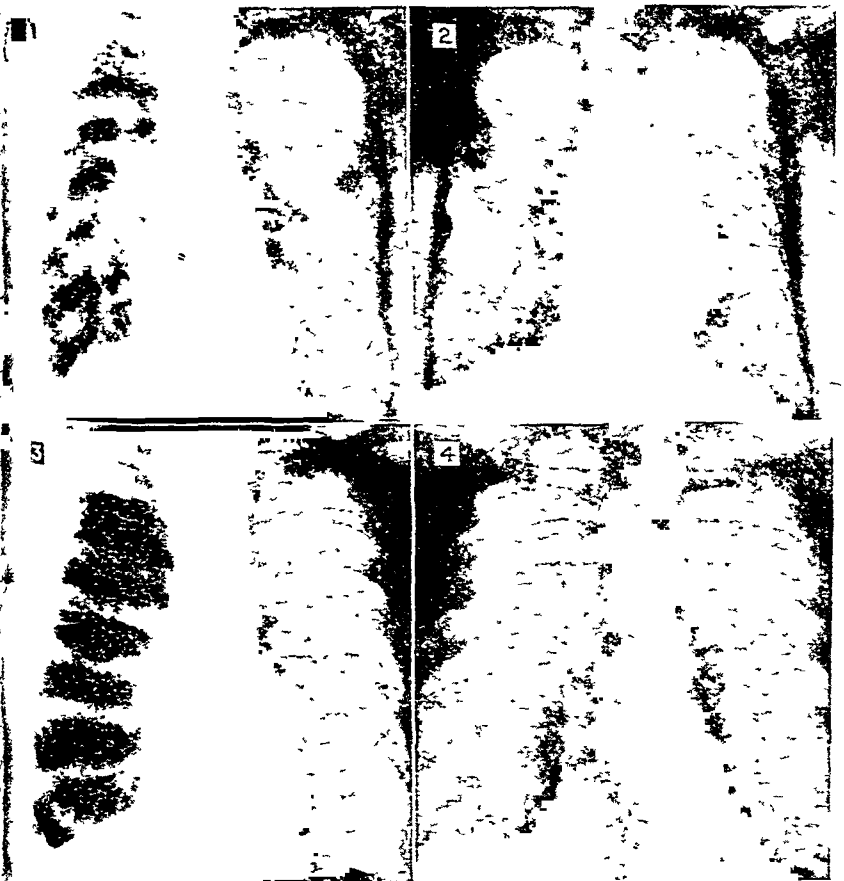
Fig. 1 shows two curves which are typical of the results obtained with methyl thiouracil, the upper one showing the effect of 200 mg., and the lower the effect of 300 mg.

With methyl thiouracil the effect of the suppression of the iodine uptake lasted as long as counting continued, generally about 6–8 hours after the drug had been given.

dust or fume inhalation, or of previous major illness. Thus the radiographic lesions are not attributable to residual changes following any specific illness or incident of which any of the workers were aware.

A sample of coke-flue dust obtained in the course of his work by a coke-oven worker was submitted to one of us (D. J. T. B.) for analysis. The dust had the appearance of burnt ash from coal; and the fine fraction, with a particle size of about 2 µ, was separated by means of a current of air. This fraction contained 34% of total silica, 2·6% of free silica, and 17·5% of iron compounds expressed as iron oxide (Fe_2O_3).

The fact that dust-products arising from the combustion of coke are siliceous is of primary importance. Similar pulmonary lesions have not been found by us, for instance, in ship's firemen who handle coal but whose work conditions resemble somewhat those prevalent among the present group. The possibility cannot be excluded that deposition in the lungs of iron oxides, which chemical analysis has shown to be present in the sample of coke-flue dust, may have caused some of the radiographic changes. These changes, however, do not resemble those of siderosis, reticulonodulation being less prominent than a patchy and rather coarse fibrosis.



Illustrative radiographs of the chest.

Case 1.—Aged 58 years, blacksmith for 36 years. Productive cough and dyspnœa for many years, gradually increasing. Right lung: fibrosis in upper zone, less in mid zone, nodulation in mid and lower zones. Left lung: miliary nodulation in lower zone, both hilar shadows accentuated

Case 2.—Aged 57 years, boiler-stoker for 23 years (working conditions reputedly bad) Cough with sputum and shortness of breath for 2 years; one small hæmoptysis Many fine râles heard in both lower zones posteriorly. Right lung: fibrosis in lower zone with several translucencies suggesting bronchiectasis, fibrosis in mid zone Left lung: fibrosis in lower zone adjacent to diaphragm

Case 3.—Aged 46 years, blacksmith for 30 years No symptoms; chest condition detected by mass radiography Right lung: slight fibrosis and translucencies in upper and lower zones. Left lung: clear, emphysematous

Case 4.—Aged 59 years, blacksmith for 46 years Shortness of breath gradually increasing for 4 years; productive cough for 3 weeks Clinically, bronchitis in both lower zones Right lung: well-marked striation and nodulation in mid and lower zones. Left lung: slight fibrosis in lower zone.

Most of the men admitted inhaling both gaseous and dusty products of burning coke, but a few claimed that little dust was inhaled. Thus the issue is raised of the relative importance of sulphur dioxide inhalation alone, and in combination with dust. It is not known whether chronic inhalation of small amounts of sulphur dioxide can cause pathological changes in the lungs that are demonstrable radiographically. Rambousec (1913) found, however, that traces of the gas acting over long periods set up inflammation of mucous membranes, bronchial catarrh, expectoration of blood, and inflammation of the lungs.

Johnstone (1941) listed the trades in which sulphur dioxide is used or in which there is risk of its being inhaled; these include foundry-workers, blast-furnace operators, and coke-oven workers. Accidental prolonged inhalation was followed by pulmonary œdema, respiratory paralysis, and asphyxia. He quoted Kehoe as reporting that chronic exposure produced upper-respiratory catarrh, anosmia, loss of sensation of taste, and increased fatigue; and other observers had noted in men exposed at work to the gas a lessened tendency to "colds" and bronchial and respiratory infections. Jacobs (1941) comments that sulphur dioxide readily evokes a defensive respiratory reflex in those unaccustomed to it, but that in time the amount necessary to produce an equal defensive response increases, indicating that tolerance may be acquired to its inhalation in small amounts. He fixed the maximum concentration that can be inspired for several hours without serious symptoms as 10 parts per 1,000,000. Durrans (1948) observed that workmen in a chemical factory exposed to an atmosphere "heavily charged with SO_2" remained remarkably free from "colds"—a fact attributed by him to the antiseptic qualities of the gas. Neither in these nor in other references to the results of sulphur dioxide inhalation is there any mention of chest radiographic findings.

Our tentative conclusion is that the series exhibits occupational pulmonary disease in men exposed to "sulphur" fumes and dust from coke-fires. Individual susceptibility may be a factor in determining the extent of the disease or disability, and the relative importance in causation of each product of combustion, solid or gaseous, is still undecided. The chemical composition of coke-flue dust could in itself account for the X-ray appearances that have been demonstrated. The patchy distribution of the X-ray changes is more readily explicable if we assume that protracted exposure to sulphur dioxide has caused localised chronic inflammation in the lungs, and that dust has later accumulated in these affected areas.

Further examinations of workers in these and allied trades are needed, irrespective of the

PNEUMOCONIOSIS AFTER EXPOSURE TO SULPHUR DIOXIDE FUMES AND DUST FROM COKE FIRES

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THERE are two aids to the detection of new types of pneumoconiosis:

(1) The patient's history. In areas with trades known to expose workers to the hazard of industrial chest disease, the physician will inquire into past dusty occupations and present work. In other areas, however, where the risk is smaller or is unrecognised, inquiry may be more perfunctory and thus an important clue remain undiscovered. In a centre where industry is various and much of it semi-skilled, workers will commonly have changed jobs once or oftener.

(2) The recognition among groups of workers of similar chest radiographic findings suggesting occupational disease. Retrospective inquiry may then discover some common factor, or factors, in past or present work conditions. The X-ray abnormality is one or more of the following:

(*a*) Fibrotic lesions that are non-tuberculous and are not attributable to, or not obviously the relic of, previous acute chest illness (e.g., pneumonia or abscess).

(*b*) Generalised miliary nodulation or nodulation mainly localised to mid and lower zones of one or both lungs.

(*c*) Chronic infiltration of bronchopneumonic type without any specific bacteriological findings in the sputum.

In pneumoconiosis lesions seen radiographically are usually bilateral; but they are not necessarily distributed symmetrically, or evenly in the affected area of lung.

Attention has been drawn to pneumoconiosis among boiler-scalers on the basis of common radiological findings and a history of inhalationary risk (Dunner 1943, Dunner and Hermon 1944). Chemical and pathological studies confirmed that siderosilicosis was present in the lungs of a boiler-scaler who died (Harding et al. 1944). Some of these patients, despite negative bacteriological findings, had been regarded up to then as cases of tuberculosis and even treated in a sanatorium.

Similarly, new types of pneumoconiosis have been detected in radiator and boiler finishers (Dunner et al. 1945), graphite-workers (Dunner 1945, 1948, Dunner and Bagnall 1946), and dockers handling grain and cotton seed, &c. (Dunner et al. 1946).

PNEUMOCONIOSIS IN STOKERS

Cases in the present series first attracted notice because of a similarity in chest radiographic findings which promoted a full inquiry into occupational history. The original case was in a man with radiological evidence of basal pulmonary fibrosis and bronchiectasis. Questioning revealed that he had been a "boiler-stoker" for 23 years, and that during his work in a confined space he inhaled "sulphur" fumes and quantities of dust, both originating from burning coke.

This case caused us to be on the alert for others, referred to the chest clinic, whose work exposed them to similar conditions. In this way a group of trades has been singled out which did not at first appear to have a common denominator of inhalationary risk. However, all the workers admitted that they had been exposed to irritant "sulphur" fumes and dust arising from coke-fires, in the course of working by open coke-fires or during intervals of hand-stoking. The trades represented in the series are boiler-stoker, blacksmith, plater, and employees in coke-oven and gas-works.

Gas-workers are subject to varying conditions, but a tour of a large efficient unit convinced us that no appreciable risk of inhaling sulphur dioxide exists, since, in the carbonisation of coal, air is excluded from the retorts. At the retorts workmen inhale briefly, but repeatedly, whiffs of crude coal-gas in a freely ventilated space. In this factory protective measures were enforced at all stages of gas-making. In the smaller and less efficient works protection may be less rigorously carried out by men and management, so that various gases and fumes or coke-flue dust may be inhaled.

Hitherto, 10 workers engaged in these trades have presented radiological signs of chronic pulmonary lesions. These 10 patients represent only a small proportion of the 50–60 such workers who have passed through the chest clinic since 1941. Thus not all the men exposed to risk develop radiographically demonstrable lesions. The radiographs of 4 men have been selected for reproduction.

All 10 patients in the series had respiratory symptoms, of which the chief were productive cough, exertional dyspnœa, and irritation of the nose and throat and sometimes of the conjunctivæ. As in pneumoconiosis generally, the severity and duration of symptoms bore no constant relation to the length of exposure or the extent of X-ray abnormality. Physical signs were by no means specific and did not conform with the abnormality later revealed by radiography. When present, sputum was repeatedly examined for tubercle bacilli, both by smears and by culture, with negative results.

The radiological appearances were those of irregular patchy fibrosis involving both lungs but usually predominant in one. In one case the right lung alone was affected, the left being emphysematous. In another the fibrosis was more diffuse, the upper zones being spared. In most the mid and lower zones showed nodulation which had occasionally produced, by confluence, patchy consolidation. Radiological evidence of emphysema was usually present, the radiotranslucent emphysematous zones being in sharp contrast with the adjacent areas of dense fibrosis. There were further signs of emphysema—flattening of the cupolæ of the diaphragm, and widening of the intercostal spaces and costophrenic angles.

In the differential diagnosis, tuberculosis was excluded with certainty. Pulmonary syphilis and Boeck's sarcoidosis were carefully considered and finally ruled out.

DISCUSSION

The association between radiographic pulmonary lesions of the type described here and a common risk of chronic inhalation of sulphur dioxide and dust, both arising from combustion of coke, is striking. It suggests a causal connexion between these occupational factors and the chronic pulmonary lesions found, which may be a type of pneumoconiosis hitherto unrecognised. In none of the workers was there any history of other risk of

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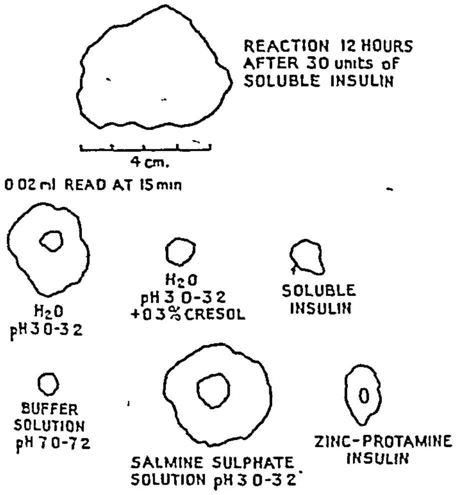
REACTION 12 HOURS AFTER 30 units of SOLUBLE INSULIN
4 cm.
0·02 ml READ AT 15 min
H₂O pH 3·0-3·2
H₂O pH 3·0-3·2 +0·3% CRESOL
SOLUBLE INSULIN
BUFFER SOLUTION pH 7·0-7·2
SALMINE SULPHATE SOLUTION pH 3·0-3·2
ZINC-PROTAMINE INSULIN

1—A typical pattern from intracutaneous tests in a patient reacting cutaneously to insulin.

edles were used. Each reaction was read after minutes' interval and plotted.

RESULTS

The results showed that patients reacting cutaneously their routine therapeutic insulin irrespective of brand so reacted to the test insulin. In some patients there ere accessory factors, such as a moderate reaction to e buffer solution pH 3·0–3·2 or a fairly intense reaction salmine sulphate, a possible explanation of these ing that the solutions were non-isotonic. None of the sts gave such an intense reaction as those obtained with lutions containing insulin.

A typical pattern from intracutaneous testing is shown fig. 1. This pattern, however, is not invariable, ce fig. 2 shows a pattern from a patient who exhibited mild local reaction and yet did not respond to intrataneous injection of insulin. Only a few patients in e present series gave this pattern of reactions. Though l British commercial insulins are prepared from ystalline insulin, secondary protein (species protein) ay come over in the preparation and be included in the al product. The quantity of this secondary protein the final product may depend on the quality and ate of the raw pancreas or the care taken in the storage nd preparation of the insulin.

To test this hypothesis a solution of insulin recrystallised six times (supplied by Boots Pure Drug Co.) as prepared in the department of pharmacology of the niversity of Leeds, the final product having the me pH and antiseptic content as commercial soluble ulin. This was used on 34 diabetic patients who cted to various brands of insulin. The test site as the flexor surface of the forearm. The patients ere given 0·02 ml. of this solution intracutaneously nd also an injection of 0·02 ml. of insulin taken from eir current vial. The areas of reaction were compared fter 15 minutes, and the results were as follows :

	Mean area (sq. mm.)	*Difference*
Patients' current insulin	635·5	484·9 ±56·1
Insulin recrystallised six times ..	150·6	

he difference is strikingly significant.

Jorpes (1949) stated that about 300 patients in Sweden eceived recrystallised insulin because they had had ocal reactions with other kinds and most of them were eleved of the reactions. The results of the present nvestigation confirm Jorpes's findings and demonstrate r the first time the quantitative improvement attained th purified insulin.

In 2 patients the area of reaction to an intracutaneous injection of insulin recrystallised six times approximated to that caused by commercial insulin :

Solution injected	*Area of reaction (sq. mm.)* Case 1	Case 2
Patient's current insulin	320	664
Insulin recrystallised six times ..	375	587
Solution 2 (water adjusted to pH 3·0–3·2 plus 0·3% cresol) ..	62	82

It will be seen that neither cresol nor the pH of the solution was responsible for these reactions. Perhaps six crystallisations are insufficient to remove all traces of secondary protein, and perhaps these 2 patients were unduly sensitive. On the other hand, it is possible that they were sensitive to insulin protein itself. Without further evidence the correct explanation is not apparent.

DISCUSSION

In patients with severe local cutaneous reactions, especially of the generalised type, desensitisation has been attempted by Bryce (1933) and Corcoran (1938), and Weitz (1943) described a method of gradual desensitisation. These techniques are tedious to perform and are not uniformly successful. One patient remained free from allergic symptoms only for fifteen days (Bayer 1934).

In the milder reactions other methods of treatment have been described, such as changing the brand of insulin, and giving antihistamine drugs—e.g., 'Benadryl' (Leavitt and Gastineau 1947) or 'Anthisan' (Hunter and Hill 1947). Paley and Dews (1949), however, show no statistically significant reduction in the size of the cutaneous reactions when anthisan was used.

Diabetic patients troubled by cutaneous sensitisation to insulin may undergo spontaneous desensitisation and this fact invalidates many of the claims of successful therapy. Spontaneous cure has occurred in 30·5% of the present series.

It is therefore suggested that recrystallised insulin should be made available for the treatment of patients whose local reactions are sufficiently distressing. During this treatment spontaneous desensitisation may occur, and even if it does not, sensitivity may be sufficiently diminished for the patients to tolerate commercial insulin *once again*.

SUMMARY

The incidence of cutaneous reactions to insulin therapy in 147 patients attending the diabetic clinic at the General Infirmary, Leeds, in 1947–49 was 55·8% and was not confined to any one brand of insulin.

Most of the sensitive patients reacted to a test solution of commercial soluble insulin.

The importance of minor accessory irritative factors has been demonstrated, such as the pH of the solution and the salmine sulphate.

The mean area of reaction to an intracutaneous injection of the patients' current batch of insulin was 635·5 sq. mm., and with insulin recrystallised six times was 150·6 sq. mm. The difference is strikingly significant. This result confirms quantitatively the clinical findings of other workers.

It is postulated that some patients are sensitive to insulin protein itself. Alternatively, these patients may be sensitive to minute traces of secondary protein still lingering in the purified insulin.

Treatment of distressing local insulin reactions with recrystallised insulin is recommended.

I wish to thank Messrs. Boots Pure Drug Co. for supplying the recrystallised insulin and other test substances, and Mr. P. Hay, of the Department of Pharmacology, University of Leeds, for preparing the solutions.

References at foot of next page

presence of chest disability. Animal experiment may perhaps yield confirmatory results. Hitherto we have not had the opportunity to study affected lungs at autopsy, which might well provide conclusive evidence.

SUMMARY

Pneumoconiotic lesions not previously described have been found radiologically among workers in a group of trades involving exposure to sulphur dioxide fumes and dust from coke-fires.

Chemical analysis of a fraction of the dust with a particle size of about 2 μ has revealed siliceous and iron compounds.

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MECHANISM OF CUTANEOUS REACTIONS TO INSULIN*

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DURING the early weeks of insulin therapy many diabetic patients are troubled with cutaneous reactions. This complication is rarely so severe that the insulin has to be stopped, but it is annoying and disturbs the patients when they are adjusting themselves to a new mode of life. Local sensitisation at the site of injection has been attributed to various factors. Banting et al. (1922) thought that protein impurities in their insulin preparation were the cause of induration of the subcutaneous tissues and an area of reddening of the skin surrounding the site of injection. With increased purification of the insulin a reduction in the incidence and severity of cutaneous reactions was reported.

When the long-acting protamine insulins were first introduced they were said not to produce cutaneous reactions, but Kern and Langner (1939) noted redness and swelling at the site of injection of protamine insulin. A similar claim was made for globin insulin by Bauman (1939), but other workers (Malins 1945, Paley 1948) have shown that it also can produce skin reactions.

In 1930, Campbell et al. showed that with crystalline insulin reactions were less severe than with commercial insulin. Allan and Scherer (1932) and Altshuler (1937) confirmed this work. Davidson (1934) and Corcoran (1938) reported single cases which gave positive reactions to intracutaneous injection of 0·1 ml. of crystalline insulin but did not indicate how many recrystallisations had been done on the insulins used. Hult and Jorpes (1949) reported a dramatic improvement following the use of recrystallised insulin instead of ordinary insulin in a sensitive patient.

Kern and Langner (1939) studied 104 diabetic patients, of whom 16% showed cutaneous reactions to protamine-zinc insulin. No positive test was noted in the whole group when injected intracutaneously with a protamine solution containing 0·1 mg. of nitrogen per ml. These workers concluded "that sensitivity to protamine could not be invoked as an explanation for the local re experienced by the 17 diabetic patients from inj of protamine-zinc insulin." Page and Bauman (1944) on the other hand, showed that protamine was in About 19% of their diabetic patients gave a reaction to intracutaneous injection of protamin solution. They also demonstrated the highly irritating effect of a zinc-chloride control solution. In the group of diabetic patients reactions to commercia beef insulin were five times as frequent as to purifie crystalline insulin.

INCIDENCE

Local skin sensitisation to insulin is undoubted common, but statistics of incidence vary great Lawrence (1925) stated that 30% of his patients had th complication, whereas Collens et al. (1934) found a incidence of 7·5%. Protamine-zinc insulin is reporte to give a higher incidence of cutaneous reactions soluble insulin. Nevertheless (see above) Kern an Langner (1939) reported an incidence of only 16% t protamine-zinc insulin. In the diabetic clinic of th General Infirmary at Leeds 55·8% of patients startin insulin therapy in 1947–49 developed cutaneous reactions Of the 147 cases studied, the reaction was mild in 81·7% (immediate in 74·4% and delayed in 7·3%) and severe i 18·3% (immediate in 17·1% and delayed in 1·2%).

The problem, therefore, is of practical as well a academic interest and merits a reinvestigation of th mechanism of these reactions.

METHOD

Diabetic patients reacting locally to their injection of insulin were submitted to a battery of intracutaneou tests as follows:

(1) Water adjusted to pH 3·0–3·2.

(2) Water adjusted to pH 3·0–3·2 with the addition o 0·3% cresol *B.P.*

(3) Ordinary soluble commercial insulin ('Regular,' wher insulin is in crystalline form), the pH and antiseptic conten of this solution being identical with test solution 2.

(4) Buffer solution with pH 7·0–7·2.

(5) Sterile 1% solution of salmine sulphate adjusted t pH 3·0–3·2.

(6) Commercial zinc-protamine insulin prepared from th same stock of insulin as test solution 3, the pH being the sam as in test solution 4 and the salmine content the same as i test solution 5.

Testing was done on the flexor surface of the forearm 0·02 ml. of each solution being injected intracutaneously Autoclaved all-glass tuberculin syringes with no. 2

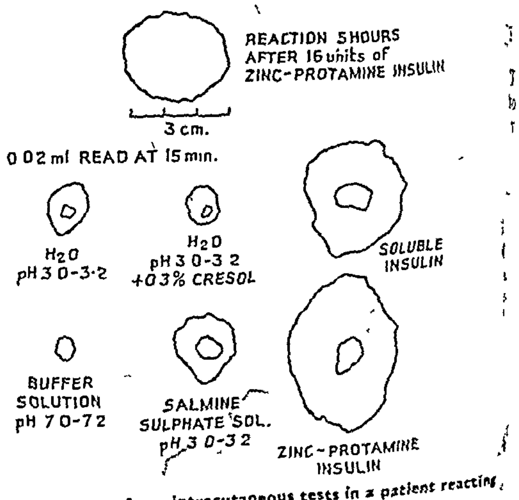

Fig. 1—Typical pattern from intracutaneous tests in a patient reacting cutaneously to insulin.

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* Based on a paper read before the section of medicine at the 117th annual meeting of the British Medical Association at Harrogate on June 28, 1949.

movement—e.g., in pressing down his car accelerator. looked well. and his legs. as before, had full power and muscle bulk; but there was general exaggeration leg tendon-jerks and bilateral ankle-clonus, which was d on the left. but not so on the right. The plantar were now indefinite but tended to be flexor, particu- on the right. In the arms there was no definite abnor- lity, but the tendon-jerks were all brisk and there was ble finger-flexion in the left arm. Sensitivity to cotton- was still diminished on the dorsa of both feet. especially left. Vibration sense was also slightly diminished at ankles, especially the left.

Aug. 31. 1948.—The patient was very well. "Jumpiness" the legs had now almost gone. A slight sensation of ness and swelling in the small toes of left foot was some- times noted at end of the day. There was hardly any weak- ness in the toes of the right foot; such as existed was more rked on dorsiflexion and in the small toes. There was very ghtly more weakness in the toes of the left foot, being a ttle less in the hallux than in the other toes. There was o other weakness. The tendon-jerks in the legs had increased, pecially in the left. Ill-sustained clonus could be elicited the left ankle. The tendon-jerks in the arms were brisk d normal. The plantar reflexes were flexor in the right and indefinite in the left. The abdominal reflexes were present, but the lower abdominal reflexes were diminished. sation was normal apart from moderate diminution of preciation of vibration, which was equal in both legs and ced at the ankles.

DISCUSSION

Gauthier (1913) pointed out that until 1874, when phoid paralyses were shown by Leydon to be due to ions of the nervous system, the view of Gruber (set in 1860) had been generally accepted—i.e., that weaknesses were due to the effects of typhoid fever the muscles. Since then, many types of nervous mplications have been described, and it is generally reed that myelitis is one of the least frequent of them. is certainly less common than typhoid polyneuritis, d even this is rare. as Wilson (1940) has pointed out, ing Rolleston's 12 examples among 3102 cases of typhoid ver. Similar figures were produced by Dufourt and oment (1934) in the Lyons epidemic, in which there re 10 cases of neuritic type among 3000 cases of phoid fever. But for many years it has been suggested at this extreme rarity of typhoid myelitis may be due incomplete examination of the nervous system or to masking of the signs by those of the general disorder. Bernheim (1895, 1912), examining a large number cases of typhoid fever from the end of the first ek of the illness and into convalescence, found at at any part of this period, and independently the severity, the tendon reflexes, particularly in legs, might become exaggerated. This was so 60% of his cases and was either transitory or lasted several weeks, and in these he felt that there was demyelinating lesion of the pyramidal tract. Rolleston 06) found alteration of the abdominal reflexes in out of 45 cases of typhoid fever; 34 of these showed mplete loss of abdominal reflexes and 4 had extensor ntar responses. Toomey (1934) described 19 cases of phoid fever which, over a period of just under three eks, showed in turn loss of abdominal responses, crease in knee-jerks, ankle-clonus, and extensor plantar sponses.

These cases of so-called myelitis "fruste" following phoid fever are probably much more common than the ree other clinical types of typhoid myelitis which ve been described: (1) "transverse" myelitis, in ich impairment of power and sensation lies pre- minantly below one level in the cord (Schiff 1900, pine 1903); (2) "ascending" myelitis (Landry's drome), which may develop very rapidly or by step-ladder" progress (Raymond 1885, Etienne 1899); d (3) "disseminated" myelitis. which may show more attered motor and sensory loss, and occasionally ataxia well (Marie 1884).

The prognosis of cases with general parenchymatous lesions varies greatly. Rapid death may ensue (Schiff 1900, Etienne 1899). or good recovery be made even from severe and extensive lesions of the spinal cord such as was described many times by Gauthier (1913). Renault and Levy (1913) in a child aged 4 years. and O'Brien (1944). The time in the course of the typhoid fever at which the myelitis appears does not seem to affect the prognosis. but it is evident that the chance of survival is better in limited myelitis than in one which rapidly becomes widespread. But prospects for full recovery are more difficult to assess at an early date, as can well be seen from the protracted history of our moderately affected case.

SUMMARY

A case of typhoid myelitis and neuritis of very protracted course is described.

The nervous symptoms came on at the end of the fifth week of a moderately severe attack of typhoid fever and resembled encephalitis; signs of neuritis and of a lesion of the spinal cord followed some weeks later.

Recovery, though very slow, has been continuous. but even after 5½ years is not yet quite complete.

The long period of healing suggests that there are permanent changes in the spinal cord. but, judged by present signs. these changes are surprisingly slight.

The progressive improvement seems to have been due to the recovery of demyelinated tracts, including the pyramidal. and to the clearing of an associated neuritis.

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DEOXYCORTONE WITH ASCORBIC ACID VERSUS ADRENOCORTICOTROPIC HORMONE IN RHEUMATOID ARTHRITIS

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WE have shown (Spies and Stone 1949a) that in persons with nutritive failure and hypotension the administration of deoxycortone acetate produces an immediate increase in blood-pressure and body-weight (the increase in weight is associated with retention of sodium), and that the blood-pressure promptly falls when the deoxycortone acetate is discontinued (fig. 1). We have also been giving large injections of ascorbic acid intravenously to persons with rheumatoid arthritis without producing any demonstrable change in their condition (unpublished work).

It was decided to select patients with rheumatoid arthritis, restrict them to a diet low in sodium, and give them injections of deoxycortone acetate and ascorbic acid. The patients were restricted to a diet containing not more than 200 mg. of sodium daily. Each of the

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PROTRACTED NERVOUS COMPLICATIONS OF TYPHOID FEVER

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THE affinity of the typhoid toxin for all parts of the nervous system has long been recognised, and in describing the nervous complications of the Lyons epidemic of 1928 Dufourt and Froment (1934) pointed out once again that all parts of the cerebrum and cerebellum, mid-brain, medulla, spinal cord, meninges, nerve-roots, and peripheral nerves may be involved.

Outbreaks of enteric fever being uncommon in this country, descriptions of its neurological lesions are very infrequent in British publications. Rolleston (1906), in a study of the reflexes of 45 typhoid victims, noted the absence of abdominal reflexes in the majority, ankle-clonus in 15, and extensor plantar responses in 4. He concluded that the toxins of the typhoid infection were liable to produce " perturbation, however transient, of the pyramidal system." Against this brief record many reports of typhoid polyneuritis, meningitis, and myelitis, and accounts of cord compression by typhoid abscess are found in reports published in other parts of the world, particularly France and Latin America.

The following case, seen with typhoid fever 5½ years ago and since observed at intervals, is presented as an example of a probable moderate degree of typhoid myelitis. It also illustrates the fact that in the wake of typhoid fever neuritis may develop concurrently with myelitis and at first mask the signs of the lesion in the spinal cord.

CASE-RECORD

A male clerk, aged 31, was admitted on Jan. 16, 1943, with ten days' history of severe headache and two days' history of a swinging temperature. He had had anorexia, epistaxis, and diarrhœa (attributed to cascara) shortly before admission.

On admission he was thin and complained of general headache, malaise, and a feeling of abdominal distension. Temperature 103°F, pulse-rate 96. The patient was rational and alert. His tongue was furred and somewhat dry. There was no neck rigidity, and Kernig's sign was negative. The abdomen was soft and slightly distended. The spleen was not felt. There were no rose spots. The cerebrospinal fluid was clear, and contained no increase in protein or cells.

Progress.—The patient was constipated for the first two days in hospital, after which an enema produced a hard offensive stool showing no abnormal organisms. On Jan. 18 the first rose spots were noted, and these continued to appear for three days and then faded. The white-cell count was 6000 per c.mm. (polymorphs 76%, lymphocytes 21%, monocytes 2%, eosinophils 1%). On Jan. 21 the patient passed about 2 pints of blood per rectum and afterwards looked pinched and dehydrated. Up to this point the temperature had been 104°F with remissions. After the bleeding the pulse-rate rose to 140. One pint of blood followed by glucose saline was given intravenously, with considerable improvement. Constipation continued, but the [illegible] *became clear* and the abdomen was not distended. [illegible] were considerable *intermissions* in the fever, though up [illegible] Feb. 1 there were *occasional rises to 104°F. Constipation* persisted, and there was little appetite through most of February and the first half of March. During *this period* the temperature usually was between 100° and 103°F, with occasional *intermissions*. On Feb. 11 the patient [illegible] mentally confused and inclined to ramble. On the 22nd phlebitis developed in the left saphenous vein and spread up *into the* thigh, causing swelling of the whole of the left leg. This gradually settled, and it was then noted (early in March) *that there was general wasting of the legs* and considerable weakness in dorsiflexing both feet. The soles were hyperalgesic, and the appreciation of touch and vibration was diminished in the feet. All the tendon-jerks in the lower limbs were much depressed, and the calf muscles were tender. The patient got up on April 16, *having by then* been afebrile for a week after several further minor bouts of fever. *S. typhi*, which was first isolated from the stool on Feb. 1, persisted till Feb. 18, sulphaguanidine [illegible] *little effect. The Widal reaction* was positive up *to* 1 in 640 dilution on Feb. 18. The tendency to foot-drop, though decreasing, lasted until the patient was discharged on May 15, 1943, being moderate in the right foot and severe in the left, for which he needed a *toe-raising spring. On his* discharge the patient was taking a good diet with added vitamins—A, B_1, and D concentrates—and he continued to take these vitamins for many months.

Follow-up.—The patient was seen again on June 30, 1943, when he reported that in the six weeks since *discharge he had* gained over 1 stone in weight. He could walk quickly but *could not run, because of residual weakness in* the legs. On examination, he showed only very slight movements in the toes of the left foot, but those of the right foot were a little stronger. There was weak dorsiflexion of both feet, particularly *of the left foot. The knee movements* were good, and no wasting of the leg muscles was seen. There was no tenderness anywhere. The knee-jerks were very brisk, the ankle-jerks *absent, and the* arm-jerks brisk. The right *plantar reflex was definitely extensor*, but the left plantar reflex was unobtainable, because of the associated lower-motor-neurone lesion. There was, however, a bilateral leg-withdrawal response. The abdominal reflexes were all present. On the feet and round the ankles sensitivity to touch was diminished and the appreciation of pain blunted and delayed. Vibration sense was impaired in both feet, *particularly* the right.

On *Sept. 14, 1943, the patient had lost the* weakness of the legs and was in generally excellent condition, but dorsiflexion was very weak in both halluces, more so in the left than the right. The knee-jerks were exaggerated, especially on the right side; the right ankle-jerk was present, but that on the left was still absent. There were bilateral *extensor*-plantar responses, with leg withdrawal. The vibration sense was still impaired, especially in the *right foot. The impairment of* sensitivity to pinprick *now* covered a *sock-like* area, more *extensive in the right leg.*

Jan. 31, 1944.—The patient felt still further improved and could walk well and run a little. There was now a feeling of stiffness in flexion of the *halluces*, and on examination these movements proved to be a little weakened, especially in the left foot. Otherwise there were *normal* power and bulk in all leg and thigh muscles. Both knee-jerks were exaggerated, much on the left and *moderately on the right.* The right ankle-jerk was brisk, and the left ankle-jerk was *for the first time* definitely present. Both plantar reflexes were extensor, but all the abdominal responses were *brisk.* The arms showed normal *power* and coördination, and the arm-jerks were brisk. Sensation showed *persistent changes*; sensitivity to touch (cotton-wool) and pinprick was still diminished in both feet, more so *in the left* foot than in the right; vibration sense at the ankles was slightly diminished more so on the left side. *Joint* sense was *normal.* The cranial nerves were all normal.

Oct. 10, 1946.—The patient reported steady progress ever since his last visit nearly *three years previously,* but *had* noted a persistent slight stiffness in the toes and the development of a " jumpiness " in the feet, *especially* the left. During the previous year this *had become* apparent *as* an occasional

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SUMMARY AND CONCLUSIONS

patients with moderately severe rheumatoid is were restricted to a low-sodium diet and given mg. of deoxycortone acetate intramuscularly and of ascorbic acid intravenously each day without any of symptoms. The ascorbic-acid injections were discontinued, but the injections of deoxycortone and the diet remained constant.

e days later three of the patients were given [illegible] ic hormone in divided doses without knowledge. The other three were given distilled at the same intervals and under the same circum[illegible]. The three receiving the A.C.T.H. had prompt Within eight hours they were improved, and improvement continued steadily during the three in which the injections were continued. The T.H. was then discontinued and these patients ptly relapsed.

This study was aided by grants from the Birmingham s Committee and from Hoffman La Roche Inc. The cortone acetate and A.C.T.H. were obtained through the rtesy of Dr. Kenneth W. Thompson, Organon Inc.; 'Lonalac' from Dr. Warren Cox, of Mead Johnson and ; and the ascorbic acid from Dr. Elmer Sevringhaus, of offman La Roche Inc.

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SYPHILITIC BURSITIS

WITH REPORT OF A CASE

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Verneuil (1868, 1873), of France, is credited with the st accurate account of involvement of the bursæ d tendon-sheaths in syphilis. He recorded 4 cases of elling of the extensor tendon sheaths of the fingers in condary syphilis and later described gummatous bursitis. Moreau (1873), Chouet (1874), and Voisin (1875) made philitic bursitis the subject of their theses. Keyes 876), in America, published 5 of his own cases and ferred to 9 others in the literature, and several cases om other countries were recorded during the next few ars (Finger 1884, Buechler 1889). Churchman (1909) ported 1 personal case, analysed the 26 cases published to then, and gave a masterly review of the subject ich remains the best available.

Since Churchman's paper about 12 further cases have en recorded, mostly by Americans (Lane 1924, Coues 26, Garner and Schoch 1931, Swartz and Tolman 32, Epstein and Friedlander 1932, Morrissey and eynolds 1933, Milian 1933, Schrager 1944). Several these authors drew attention to the rather surprising sence of any published reports from the British Isles d to the fact that English writers on syphilis have her not referred to syphilitic bursitis or have given no tisfactory description of it.

CONGENITAL SYPHILITIC BURSITIS

Bursitis has only once been described in congenital philis—by Coues (1915), who reported an indolent ecranon bursitis in a boy aged 13. The bursa was ened and found to contain "gummy honey-like aterial." The blood Wassermann reaction was negative, t a radiogram of the legs showed tibial periostitis, d the response to specific treatment was prompt. Coues remarks that Clutton (1886), in his original account of symmetrical synovitis of the knees, did not mention the bursæ, and that there is no record of their involvement in other cases of synovitis.

BURSITIS IN ACQUIRED SYPHILIS

A simple serous bursitis and tenosynovitis can occur in the secondary stage of syphilis, but the symptoms are of short duration with or without treatment and cause so little disability that the condition is of minor importance. Though 9 of 26 cases collected by Churchman (1909) were of this type, all cases subsequently recorded have been in the tertiary stage.

Age.—If Coues's congenital case is excluded, the patients' ages have ranged from 41 to 68.

Sex.—Women are affected much more often than men.

The *duration of the syphilitic infection* has usually been unknown, but has been known to exceed twenty years.

The duration of the bursitis has been from a few days to fourteen years.

Bursæ Involved.—In most of the cases in women one or both prepatellar bursæ have been involved. In men the olecranon bursa has often been affected, but almost any bursa may be involved. Labarthé (1873) described involvement of an occupational bursa at the radial border of the right index finger in a joiner.

Influence of Trauma.—Trauma is undoubtedly of great importance in determining the localisation of syphilitic bursitis. Many of the women with prepatellar bursitis had been employed as cleaners, and other patients have given a definite history of an accidental injury which preceded the bursitis.

Clinical Features.—At an early stage the affected bursa is swollen, moderately tender, and fluctuant, but the overlying skin is unaltered. Later the swelling increases but becomes firmer and no longer fluctuant, and the surrounding tissues also become indurated. Subsequently the overlying skin shows a dull red discoloration and breaks down into punched-out ulcers, which tend to be grouped in the arcuate pattern typical of nodular ulcerative cutaneous syphilides. Eventually, if no treatment is given, a large fungating mass of gummatous tissue may develop. Symptoms are disproportionately mild. Spontaneous pain and tenderness on pressure are slight or moderate. There is little or no limitation of movement in the neighbouring joint and no radiological evidence of syphilitic involvement of the joint or bones. Tertiary cutaneous syphilides on the skin elsewhere have been present in several reported cases, but evidence of involvement of the cardiovascular system or of the nervous system has been exceptional. The blood Wasserman reaction is positive.

Pathology.—Material for histological examination has seldom been obtained. In Schrager's (1944) patient the changes were those of a simple gummatous inflammation.

Treatment.—The response to specific treatment has in most patients been dramatic, many cases resolving completely in 6–8 weeks.

CASE-RECORD

A married woman, aged 64, had been employed for the last seven years as a cleaner. Eight months before she attended the skin department she had felt slight pain in the left knee when kneeling at work. A soft swelling had then appeared over the knee-cap, and in a few weeks had become larger and harder and caused much discomfort on kneeling. After about two months the overlying skin had broken down into a few ulcers, which had discharged slightly, since when the condition had not changed. The patient had not had to give up work, because pain on kneeling had never been severe, and there had been no difficulty in bending the knee. She had had no spontaneous pain in the knee.

three meals was prepared and served under the supervision of Miss Jean Grant, nutritionist. Bread and butter without salt were used, and 'Lonalac,' a low-sodium milk powder, was given in an amount equivalent in protein value to a quart of whole milk. Each patient was allowed 60 g. of meat and one egg daily. The rest of the diet consisted of foods low in sodium content (Bills et al. 1949) in amounts sufficient to give a total of less than 200 mg. of sodium daily.

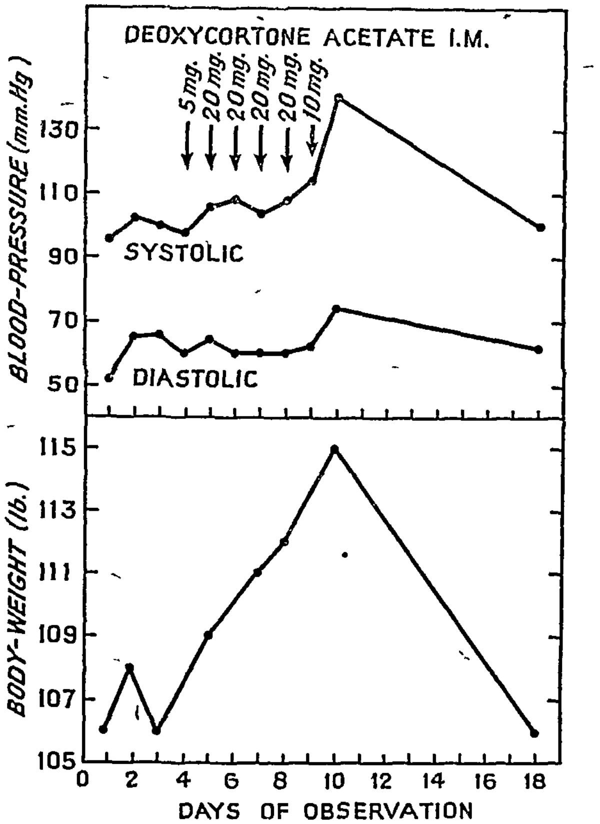

Fig. 1—Prompt increase in body-weight and blood-pressure under treatment with deoxycortone acetate.

To ensure that our patients were capable of responding we felt that we had to inject them with a compound which we knew could ameliorate the symptoms of rheumatoid arthritis. Hitherto we had tested A.C.T.H. on two patients with eosinophilia, who had responded to A.C.T.H., given in amounts of 25 mg., by a decrease of 50% or more in the circulating eosinophils. Thus A.C.T.H. had been shown to be potent in this manner (fig. 2).

Accordingly three men and three women, aged 31–64, were chosen. All of them had moderately severe rheumatoid arthritis and had had it for 2–10 years.

We had initiated this study but had not noted any relief from the combined injections of deoxycortone acetate and ascorbic acid when the preliminary communication by Lewin and Wassén (1949) appeared in THE LANCET. In this article they stated:

> "Five minutes after the injections the articular pain began to diminish and the articular mobility began to increase. Fifteen to thirty minutes later, the pain had practically disappeared and the mobility improved as much as the anatomical changes in the joints and muscular atrophy would allow. All the patients reacted in a similar way. In some cases the improvement was astounding. . . . The effect lasted from two to six hours, occasionally more than twenty-four hours."

We continued our studies for some days with their observations in mind, but we saw no amelioration of symptoms despite the fact that the ascorbic acid and deoxycortone acetate were injected almost simultaneously.

Without the patients knowing about it we divided them into two groups. Three of them were given injections of A.C.T.H. (8mg. four times a day); the other three were given injections of distilled water at the same times. Both groups remained on the diet, which was constant, and received the daily injections of deoxycortone acetate. By the time the injections of A.C.T.H. were started the patients were excreting little sodium in the urine. A representative study is shown in fig. 3.

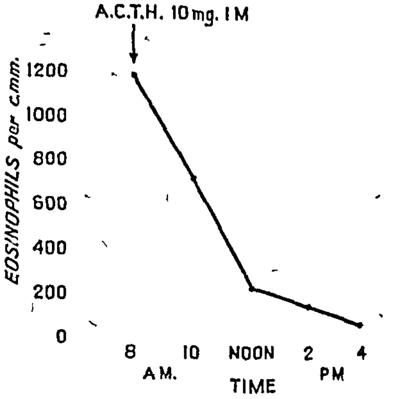

Fig. 2—Rapid decrease in eosinophilia after a injection of A.C.T.H.

The three patients receiving A.C.T.H. responded a has been described by Hench et al. (1949), Spies and Stone (1949b), Spies et al. (1949), and Markson (1949). They had an increased sense of well-being, they became less stiff, and the swelling and tenderness of the joints decreased. The patients could do things which previously they could not have done. One man, for example, who had previously had to be aided to get out of a wheelchair, could get out of the chair and walk to an automobile. After three days' therapy we were certain that the patients had responded clinically and we stopped giving the A.C.T.H. because of its scarcity. The tenderness, swelling, stiffness, and irritability returned within a few days. In a few more days the patients had relapsed almost to the condition in which they were at the start of treatment.

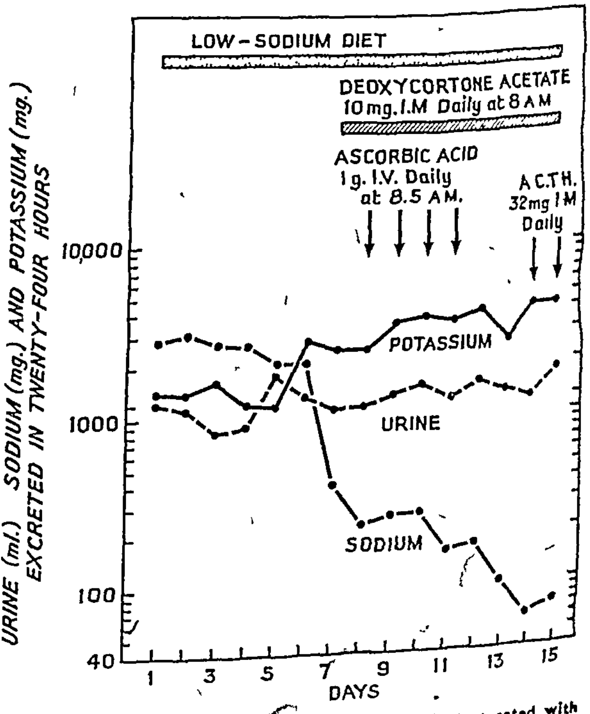

Fig. 3—A representative chart of one of the patients treated with injections of deoxycortone acetate and ascorbic acid, followed by injections of A.C.T.H.

; lumbar puncture usually revealed an increased content of the cerebrospinal fluid; and myelo- usually established the diagnosis. Other con- in the differential diagnosis were tuberculous metastatic carcinoma, and spondylolisthesis. 3% of operations no lesion was found. Naffzinger's and pain on lumbar pressure with the patient prone were important aids. Treatment followed the lines of bed rest, a plaster jacket for six weeks, and thereafter a corset, operation being reserved for cases which resisted treatment or recurred often. Manipulation was dangerous. Exploration must be extensive, including the 4th and 5th lumbar and the 1st sacral roots without laminectomy; both sides should be explored and the theca opened. Arthrodesis was usually performed only if relief was incomplete.

Mr. **Wardle** regarded retropulsion of a disc as secondary to loss of equilibrium of the whole spine and loss of elastic reaction in many discs. A plaster jacket, applied in head suspension, had given complete relief in 60% of patients. Mr. J. R. **Armstrong** detailed causes of operative failure: sometimes there was no lesion, or, more often, exposure was at the wrong level or a midline disc made disclosure difficult; a double lesion occurred in about 20% of cases; a bilateral lesion might need exposure on both sides; insufficient removal might allow further protrusion; a previously healthy disc might prolapse; a nerve-root might be damaged or might become adherent; there might be arthritis of intervertebral joints. Arthrodesis at the time of operation was unnecessary; it increased the complications and danger—and demanded more prolonged postoperative immobilisation. If required, arthrodesis could more conveniently be done later; it was difficult to repeat an operation on a root after an unsuccessful arthrodesis.

Mr. R. H. **Young** admitted an increasingly conservative approach. Mr. **William J. Virgin** (Liverpool) had studied deformation of vertebral discs under load and recovery on release. Performance, which improved with age and with successive loadings, did not appear to depend upon an intact nucleus, but upon the fluid content of the disc. Mr. G. L. **Alexander** (Bristol) stated that lumbar-disc protrusion might co-exist with spondylolisthesis, at the same or at a different level. Mr. **Nicoll** regarded myelography with the newer fluids as safe and helpful. Dr. E. J. **Crisp** had found that about 80% of patients were relieved by the application of a plaster-of-paris jacket without suspension. Mr. **Sayle Creer** (Manchester) advocated early operation, and Mr. **Philip Newman** emphasised the dangers of flexion in manipulation. Mr. A. D. **Le Vay** thought that clinical investigation was often neglected. Mr. K. H. **Pridie** (Bristol) ascribed the 20th-century tribulations of the low back to its want of one day's rest in seven.

Other Subjects

Protrusions of Cervical Discs.—Mr. **Alexander** referred first to nerve-root compression. He ascribed the frequent affection of the 6th and 7th cervical roots to their thickness; the 8th cervical root, also thick, escaped because its course was less oblique and it was less prone to stretching by cervical and shoulder movements. In cord compression, the symptoms and signs were often confused and lumbar puncture seldom helped, but myelography was helpful. Cord compression called for laminectomy and removal of the displaced material. Operative results were imperfect. Mr. **Barnes** advocated laminectomy in cases of injury of the cervical spine, with paraplegia but without bone displacement, if myelography revealed a protruded disc.

Lambotte and the Early Period of Bone Suture.—Prof. J. **Verbrugge** (Antwerp) painted a vivid picture of Monsieur Aloin Lambotte, an early pioneer of bone suture. At 85 this versatile and ingenious man still sometimes operated.

Fractures of the Upper End of the Radius in Children.—Mr. C. C. **Jeffrey** (Birmingham) confined himself to fractures through the neck of the radius and separations of the upper epiphysis. Most were abduction injuries, the position of the forearm determining the direction of the tilt, which could be estimated before reduction by radiography with the limb in various positions of rotation. Closed reduction was performed by digital pressure on the radial head in an appropriate position of rotation with adduction of the elbow. Late review showed good results provided that the radial head had not been completely displaced. Occasional premature fusion was much more pronounced if there had been complete separation, which led to deformity of the head and limitation of movement. Mr. R. C. **Murray** (Inverness) considered that open reduction was seldom needed. Mr. V. H. **Ellis** thought that limitation of rotation might be caused by subluxation of the lower radio-ulnar joint from disproportionate growth of the forearm bones after premature fusion of the upper radial epiphysis. Manual reduction of a greenstick fracture of the radial neck could not be maintained. Mr. **Scott** agreed that tilting of the radial head in young children needed no correction.

Experimental Rupture of the Medial Ligament of the Knee.—Mr. E. A. **Jack** (Edinburgh) had studied the results of experimental rupture in the cat. Ligamentous recoil always left a gap, which could no longer be closed after 7–10 days. Healing ensued except when the rupture was at the upper end. These experiments suggested that the ligament should be sutured during the first week, with the least possible damage to its blood-supply.

Hallux Rigidus.—Mr. A. C. **Bingold** (Leeds) showed how the basal epiphysis of the great toe might ossify from a dense or bipartite centre in the normal course of development, and he described the pathological changes in early and late hallux rigidus.

Osteotomy of the Spine.—Mr. W. A. **Law** showed a film of the operation and results of Smith-Petersen osteotomy in ankylosing spondylitis.

Experiences in Mauritius.—Mr. J. M. **Fitton** (Mauritius) described the island's peculiarities and the orthopædic service which had been developed since 1945, when an epidemic of poliomyelitis occurred. Mr. H. J. **Seddon** referred to the magnitude of Mr. Fitton's task and his modesty. Other Colonial orthopædic centres had now been established in Malta, Nairobi, and Lagos; and it was imperative that the men who built these up should find places on their return home.

Radiology and Histopathology of Malignant Bone Tumours.—Dr. A. L. **Taylor** and Dr. P. H. **Beamish** (Bristol) summarised the records of the bone-tumour registry at Bristol Royal Infirmary. The 72 primary bone tumours which had been recorded were classified as: (1) related to bone tissue, (*a*) osteogenic sarcoma, (*b*) chondrosarcoma, (*c*) fibrosarcoma; and (2) arising within the marrow cavity, (*a*) Ewing's tumour, (*b*) reticulosarcoma, and (*c*) multiple myeloma. Dr. R. C. **Tudway** (Bristol) pleaded for the treatment of osteogenic sarcoma by deep X-ray therapy alone. Mr. **Barnes** and Mr. H. E. **Harding** agreed about the value and safety of biopsy. Mr. K. I. **Nissen** spoke of the importance of the patient's age in diagnosis: Ewing's tumour seldom occurred after the age of 17 years, and osteoclastoma rarely before 20.

Posterior Scapulo-humeral Arthrodesis.—Mr. **Brittain** reported that bony fusion had taken place in 24 out of 30 patients operated on by himself and others.

Pregnancy and Skeletal Tuberculosis.—Mr. M. C. **Wilkinson** (Black Notley) described the effects of pregnancy in 32 cases of skeletal tuberculosis; in none had harm ensued. Mr. E. G. **St. Clair Strange** (Canterbury) confirmed this in 27 cases of sacro-iliac tuberculosis.

Excision of the Carpal Scaphoid Bone.—Mr. F. C. **Dwyer** (Liverpool) had found generally satisfactory results from complete excision of the carpal scaphoid bone in 19 patients with symptoms from ununited fracture. Mr. **Nicoll** considered that ununited scaphoid fractures called for no treatment if symptomless, excision if there were pain and only local arthritis, and arthrodesis if there was severe arthritis.

Arthroplasty of the Hip-joint.—Mr. **Charles Gray** demonstrated a film of cup arthroplasty of the hip through a lateral approach with removal of the great trochanter. Mr. **Pridie** preferred an anterolateral approach.

The patient said that she had always been healthy. She had never had a miscarriage, and could not recall any skin eruptions. Her first husband, by whom she had had three children now aged 29, 26, and 19 and in good health, had committed suicide seventeen years ago. Her second husband, by whom she had one child now aged 11 and also healthy, was alive and well.

On examination there was an indurated swelling $2^{1}/_{2}$ in. in diameter in front of and adherent to the left patella. The skin overlying the indurated area and extending downwards over the ligamentum patellæ was infiltrated and dusky red. There were three or four small punched-out ulcers and the scars of healed ulcers in this area. There was no local tenderness. Movements of the knee were full and painless. There was no clinical or radiological evidence of syphilitic involvement of the cardiovascular system or of the nervous system. The blood Wassermann reaction was strongly positive.

Radiological Examination (Dr. J. Lavelle).—There was no radiological evidence of osteitis or of periostitis. The tibia, fibula, and lower end of the femur were normal. There was a mild marginal hyperostosis of both patellæ, both femora, and both tibiæ—degenerative changes not excessive for the patient's age. The prepatellar bursa on the left side was swollen.

Progress.—The lesion regressed satisfactorily under treatment with bismuth injections and systemic penicillin.

COMMENT

The fact that only about 40 cases of syphilitic bursitis or tenosynovitis have been recorded probably gives a false impression of the rarity of the condition. Three of the authors who became interested were able to collect several personal cases in the course of a few years (Keyes 4, Verneuil 7, Moreau 4). Thus it seems likely that the true nature of some cases of "chronic housemaid's knee" remains unsuspected. Many of the published cases had been so diagnosed and had been treated ineffectively for long periods, with occasional resort to surgical intervention with unfortunate results.

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Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE annual meeting of the British Orthopædic Association was held in Bristol from Oct. 13 to 15 under the presidency of Mr. S. A. S. MALKIN (Nottingham).

Relationship of Orthopædic Surgery and Traumatic Surgery

Mr. WILLIAM GISSANE (Birmingham) said that 80% of patients who attended the casualty departments did so because of accidents, and only 10% were referred to the medical or general surgical departments. The casualty department had often proved a barrier to prompt effective treatment, and control of this department might justly be claimed as an orthopædic commitment. Fractures provided but a small part of the work of accident services. Accident hospitals like that at Birmingham could be developed for a population of about two million people, and both on economic and clinical grounds they should receive at once injuries of a specialised nature. An accident unit should retain and develop its relationship with surgery as a whole, and every accident hospital should be attached to a teaching hospital. After preliminary experience in general surgery and full training in orthopædic surgery, intending traumatic specialists should acquire at least the first principles of plastic surgery and thereafter gain practical knowledge of the work of a special accident unit.

Mr. E. A. NICOLL (Mansfield) said that traumatology was now practised in three ways: in conjunction with orthopædics; as part of general surgery; and as a specialty in its own right—though this was hardly yet justified, and in any event practice of such a specialty called for an orthopædic training. Better distribution of orthopædic surgeons was required. Mr. H. OSMOND-CLARKE suggested that accident units should usually be situated in general hospitals, closely associated with teaching hospitals. Whether the surgeon confined himself to traumatic work or not, training in general and orthopædic surgery was indispensable. Mr. RAINSFORD MOWLEM emphasised the importance of full coöperation in any traumatic unit between plastic and orthopædic surgeons. Mr. PHILIP WILES wondered whether the training of orthopædic surgeons would not be better organised with a university degree in the offing. Mr. R. H. METCALFE referred to one Metropolitan region in which registrars had been enabled to gain a varied experience by rotation through appointments in casualty departments, wards, consultative outpatient departments, and long-stay orthopædic hospitals. Mr. BRYAN MCFARLAND (Liverpool) held that an accident unit should be within a general hospital, with an orthopædic surgeon in charge, a plastic surg[illegible] treatment of injuries and in the [illegible] specialists. Mr. H. A. BRITTAIN [illegible] a certifying board appointed by the association, like the American Board of Orthopedic Studies.

Mr. A. N. BIRKETT (Nottingham) believed that accident hospitals were impracticable in many places. Experience, he said, was more important than a certificate. Miss M. FORRESTER-BROWN (Bath) referred to the Ontario scheme of postal advice on radiographs. The PRESIDENT hoped that this expedient would not be adopted here. The general hospital, he said, was the place for accident units and the training of orthopædic surgeons. Mr. H. LANGSTON (Southampton) said that pending the formation of large accident units, Mr. Metcalfe's scheme for registrars was excellent. Mr. NORMAN ROBERTS (Liverpool) urged that the accident unit should be situated in the general hospital, and that the casualty department should be controlled by the accident service and directed by the orthopædic surgeon. Mr. J. C. SCOTT (Oxford) deplored the inadequate orthopædic training of many traumatic surgeons. Mr. E. N. WARDLE (Liverpool) regretted the frequent appointment of the most junior member of a general-hospital staff to the casualty or accident department. Mr. ROLAND BARNES (Glasgow) advocated an accident unit under the control of the orthopædic department in every teaching hospital, for the sake of training undergraduates. Prof. GEORGE PERKINS thought that it might be agreed that everyone practising orthopædic or traumatic surgery must be properly trained and that traumatology was not to be encouraged as a specialty. The PRESIDENT concurred with this view and that practical experience was more important than a special degree; emphasis should be on training in general orthopædic surgery; and thereafter there should be special training in the principles of plastic surgery and specialisation in traumatology.

Lesions of the Lumbar Intervertebral Disc

Mr. J. PENNYBACKER (Oxford), on the basis of 800 cases, drew attention to the importance of differentiating disc lesions from cases of neoplasm. The latter were often misleading in their symptomatology, but their neurological signs were usually progressive. With a new growth, radiographs would occasionally show scalloping of the vertebral bodies or increased width between the

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LITERATURE ON REQUEST

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Reviews of Books

British Surgical Practice

Vol. VI. Editors: Sir ERNEST ROCK CARLING, F.R.C.S., F.R.C.P., consulting surgeon, Westminster Hospital; Sir JAMES PATERSON ROSS, M.S., F.R.C.S., director of surgical clinical unit, St. Bartholomew's Hospital, and professor of surgery in the University of London. London: Butterworth. 1949. Pp. 554. 60*s*.

THE first five volumes of this great work have already been reviewed in these columns. Volume VI covers the surgical alphabet from Malingering to Peritonitis, in 37 sections. The high standard of text and illustration is maintained. We have commented before on the way in which surgical lumber and folklore have been cleared out, and here the good work continues—e.g., with the omission of Loewe's mydriatic test in acute pancreatitis. It is impossible to do justice to the individual excellences of 37 authors, but Sir Stanford Cade and Mr. E. Stanley Lee on malignant disease of the mouth and pharynx, Mr. Ivor Lewis on cut throat, and Mr. P. R. Allison on the œsophagus are particularly good.

The Group Approach to Leadership-Testing

HENRY HARRIS, M.D. With a foreword by General Sir RONALD ADAM and a preface by Brigadier A. TORRIE, formerly Director of Army Psychiatry. London: Routledge & Kegan Paul. 1949. Pp. 288. 21*s*.

THIS is an unofficial account, based on long personal experience, of the procedures used by War Office selection boards. The author was, by general repute, highly adept in the techniques he describes. Unfortunately skill in the practice of a technique does not always make for clarity in its exposition, and Dr. Harris has not simplified his task by combining psychiatric jargon with a military system of abbreviations. We encounter in his pages such monsters as MATCOP (mature coöperative or objective personality) and IMAG (immature-aggressive personality) and we make our way through the "progressive revelation of personality from the UGD through the IS to the HPS." Nevertheless, those who are concerned to discover "what went on at WOSB" will find the procedures fully described here. Dr. Harris is at his best when what he is describing is most concrete, whether it be the various group situations which were contrived for officer selection, or the methods of Japanese wrestling, which analogy prompts him to consider; he is least at home in his introductory treatment of theory. The formidable task of validation is not seriously attempted (we learn from Sir Ronald Adam's foreword that it will be undertaken in a later, and official, account); and the chapter, by another author, on the validation of boards, observers, and selection procedures could probably have been omitted from the present work without detriment.

Bacteriological Technique

A Guide for Medical Laboratory Technicians. W. W. W. MCEWEN, A.I.M.L.T., F.R.M.S., chief technician, pathological laboratory, Neath General Hospital. Foreword by Sir ALEXANDER FLEMING, F.R.C.P., F.R.C.S., F.R.S. London: J. & A. Churchill. 1949. Pp. 293. 15*s*.

MUCH clinical laboratory work now devolves on technicians. Their duties are diverse and exacting and in the public interest they need to have a high level of competence. Certificates of proficiency in laboratory technique are granted by the Institute of Medical Laboratory Technology, which has also arranged for regular courses of instruction in many centres throughout the country. These courses have accentuated the need of textbooks written specially for technicians, and this book, based on 25 years' experience, is sure of a warm welcome. In 31 chapters it covers the whole field of bacteriological technology, dealing more fully with practical details than do books addressed to medical students.

The first 7 chapters deal with laboratory equipment and maintenance. The next 15 describe standard procedures, such as sterilisation, centrifuging, media-making, and filtration. The remaining chapters are mainly descriptions of the common routine examinations, including those of water, milk, stools, swabs, and sputa. The final chapter is a useful account of the microscope, by E. G. Knowles.

The book presupposes a good knowledge of chemistry physics and considerable practical experience of bacte logical technique; it also supports the view that bacte logical technicians must know something of bacteriol itself. The writing is in the main clear and simple, bu contaminated by laboratory jargon and faulty spelling; text of the second edition should be passed through a fi that will remove these impurities, and also the marks exclamation. The figures are numerous and good.

The best judges of the work will be technicians, the author is entitled to look to them for criticisms suggestions; but two general comments may be ventu here. There can be no doubt about the superio of binocular over monocular microscopes for regular prolonged work; it may be true, as stated in this bo that for critical work they are less good, but freed from eyestrain far outweighs this objection. A chap on histological technique is too sketchy to be of pract value, and is superfluous in view of the special bo on this subject.

La streptomycine et le "P.A.S." dans le traitement la tuberculose chez l'enfant

MAX-HENRI BÉGUIN, médecin-assistant à l'Hôpi Jenner, Berne. Basle: Karger. 1949. Pp. 96. Sw. fr.

PROGRESS is so swift in chemotherapy that publicati are soon out of date. A monograph on streptomyc published in November, 1949, and based largely reviews of the literature, is unlikely to be of great va if, as in this case, it covers only publications to beginning of 1948. Dr. Béguin gives a short histori account of the in-vitro and experimental results, a the distribution and administration of the drug. T clinical review deals with all forms of tuberculosis in child, and gives in detail some of his own results: cases of meningitis were treated, with 11 deaths; children with miliary tuberculosis (which in only 1 w acute) were treated with streptomycin, and 2 w streptomycin and P.A.S.; the period of observation w six months. He also reports 4 cases of primary infecti treated with streptomycin, and 8 with streptomycin a P.A.S., and concludes that the results were better wi combined treatment.

The Function of the Thyroid Gland (Oxford: *Blac* well Scientific Publications. 1949. Pp. 37. 5*s*.).—Prof. J. Means, of Harvard, is both learned and stimulating; prose is full of amiable idiosyncrasies and is always wor reading; and this is a good lecture, though not of course comprehensive work.

A Short History of Physiology (2nd ed. *London* Staples Press. 1949. Pp. 140. 10*s*. 6*d*.).—Prof. Kenneth Franklin has given us a second edition of his little book. some 130 pages he traces the story of 2000 years of progre with at least a bare mention of some 500 of those who hav most contributed to it. To those who are not already famili with the subject, information so condensed can hardly mal easy reading, but physiologists will appreciate the industr and accuracy with which he has fitted the disjointed piec into the mosaic of his little picture.

Discoverers for Medicine (New Haven: Yale Universit Press. London: Oxford University Press. 1949. Pp. 219. 18*s* —Many of the most valuable discoveries from which medici has benefited have been made by men outside the ranks the medical profession. Dr. William H. Woglom's summar of these shows how much indebted the profession has bee to those "amateur" scientists. Not easily, and by the tedio process of trial and error, often in its course resulting damaged health, if not actually loss of life itself, did the pioneers pave the way for those methods of diagnosis an treatment which are now a commonplace. Dr. Woglom arresting narrative, full of facts hitherto unknown to th ordinary reader—and indeed to many in the medical professio itself—is a record of human endeavour crowned by succes He tells, for example, of Stephen Hales, a clergyman, fro whose remarkable investigations into the mechanics of th circulation derived our knowledge of the blood-pressure, an of Johann Mendel's discoveries in the field of heredity—perhap the most fascinating story in the book.

THE LANCET

LONDON: SATURDAY, DEC. 31, 1949

Control of Tuberculosis

LULLED by a slightly falling death-rate, we are apt to forget that in England and Wales tuberculosis still carries off some 400 people a week. An epidemic which killed on such a scale would arouse intense anxiety, and the sense of resignation which prevents stronger action against this endemic disease is quite irrational. Admittedly the rise in annual notifications may be due to better case-finding; but ought we to tolerate a system under which the diagnosed cases do not get prompt treatment? The rate at which sanatorium waiting-lists are growing was illustrated by Dr. H. J. TRENCHARD[1] when he said that the number of those awaiting admission to chest hospitals in the North West Metropolitan region rose from 1250 at the end of 1948 to about 2000 last September. To reduce the harm done by such delay, the domiciliary treatment of tuberculosis has been developed in a wider and more ambitious way than was ever previously considered; and it has proved its worth. The range of home treatment now undertaken by chest-clinic physicians is considerable in some areas, and could probably be extended everywhere. Certainly it represents an advance on the practice of leaving the patient to wait at home untreated—often for months, sometimes for more than a year. But surely the right time for home treatment is not at the beginning but at the *end* of the therapeutic course. Present housing conditions often make the nursing of the infectious patient both difficult and dangerous,[2] and such a patient, left in contact with his family, can seldom be trusted until at least he has been trained in sanatorium routine. There is a place both for institutional and for domiciliary care of tuberculosis; but normally the former should precede the latter, in the interest both of the patient and of the community. As Dr. C. H. C. TOUSSAINT[3] says, "there can be no more effective preventive measure than the conversion of infectivity."

To use the existing sanatorium beds to the best purpose is a measure of economy; but the policy of immediate admission cannot in fact be brought into action unless more beds are provided—at least temporarily. It is true that improvement of domiciliary care permits a quicker turnover, and sanatorium physicians could improve the situation if, when home conditions are suitable, they would discharge patients earlier to the care of the clinics. But the modification of sanatorium practice, however desirable, would not suffice in present circumstances to bring tuberculosis under control. Waiting-lists cannot be overtaken, and a rational policy cannot be initiated, unless we deliberately devote to this disease some of the beds now reserved, or used, for other diseases. Is tuberculosis really receiving the share of our medical resources which it deserves as a disabling and destructive disease of *young people*? Far from it—this infection, which could be virtually eradicated from this country within a few years if we took enough trouble, is allowed to reproduce itself continuously because, for historical reasons, it has been assigned a relatively low medical priority. As Dr. TOUSSAINT says, it is appalling that sufferers from the disease which takes a greater toll than any other of our industrial population should be debarred from all but a few hospitals, and should be forced to wait months for admission. Anyone coming to this problem with fresh eyes and an unperverted sense of proportion would certainly demand that priority for tuberculosis should be raised, that waiting-lists should be abolished at once by admitting patients to infectious-diseases and general hospitals, and that the complementary domiciliary service should be developed and used for its proper purpose—as a means of giving efficient and economical care to patients who have been made non-infective.

Given the will, however, there are still difficulties to be faced; and the biggest is that this is a question not of beds merely, but of nurses. Many nurses have an objection to nursing tuberculosis, and it is not altogether ill founded. Dr. DONALD COURT[4] has collected evidence to show that nurses are probably more liable to contract tuberculosis than women in other professions; but tuberculous infection has not yet been admitted to be an occupational hazard of nursing, and no special financial provision is made for those who go down with it. Miss EILEEN ANDREWS,[5] who has followed the histories of 59 tuberculous nurses over six years, found that many of them suffered great financial hardship. It is customary to say that sanatorium nurses—being better trained in protective measures, and more closely watched for signs of infection—are less likely to acquire the disease than nurses in general hospitals, and this may well be true, though we know of no published evidence to that effect. The Prophit Tuberculosis Survey,[6] however, showed that nurses in general hospitals with tuberculosis wards are four times as liable to tuberculosis as women in the general population, and that nurses in general hospitals without such wards are twice as liable. Hence the policy of admitting tuberculous patients to general hospitals and infectious-disease hospitals should be introduced only after full discussion with the nursing profession. Moreover, supervision of the nurse's health should be raised in all hospitals to the level recommended by Dr. COURT, and the whole subject of risk should be openly aired, so that nurses know clearly what they are undertaking and what is being done to ensure their safety and (at the worst) their care if they fall ill. In addition, pending the controlled trials, which we all desire, on "persons not known to be exposed to special risk," such protection as B.C.G. vaccine may afford should be offered to Mantoux-negative nurses as a routine.

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[1] *Lancet*, Nov. 19, p. 956.
[2] *Ibid*, p. 953.
[3] *Ibid*, Dec. 24, p. 1199.
[4] *Ibid*, Nov. 12, p. 874.
[5] *Ibid*, 1943, ii, 30, and Nov. 26, p. 1011.
[6] Tuberculosis in Young Adults. London, 1948

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missionary who arrived at Chesterfield 16 days re the first case there was recognised but who, far as could be ascertained, had never been ill. ugh differing widely in case-incidence and fatality- tes. the two outbreaks were alike in including no ses in children under 3 years old and no deaths children under 8 years. The 78 patients in the two tbreaks included 5 over 60 years of age and were out equally divided between the sexes. Multiple ses in families were common; 12 out of 25 families Chesterfield had more than one case. Clinically, th outbreaks were typical. Most of the cases began th a feverish phase lasting 2–3 days, accompanied headache, anorexia, vomiting, and occasionally arrhœa. After a few days of comparative well- ing, the patients who were to develop paralysis gan a second feverish phase with headache, followed muscular pain, weakness, and spasm. In nearly these cases the lower limbs were affected. Trunk ralysis was also common but the upper limbs ere not often involved; the left arm was affected ore than twice as many times as the right. Menin- al, bulbar, and cerebral involvement and cranial- rve palsies were not seen in these outbreaks, and e deaths were all due to an ascending paralysis fecting the respiratory muscles. Lumbar puncture as done on 12 of the patients, all during or after e second week: the cerebrospinal fluid showed the ual increase in protein, but the cell-counts were ostly raised less than usual and were unrelated to the degree of paralysis. Histological studies on necropsy material from two cases revealed the typical lesions of poliomyelitis in the cord, most marked in the lumbar region; and the diagnosis was confirmed by injection of infected material into monkeys.

Low temperatures are used to preserve viruses in the laboratory, so one might expect the poliomyelitis virus to survive 80° of frost; and these Canadian outbreaks prove that at least one strain can not only survive but spread in an Arctic winter. Unfortunately the outbreaks throw no immediate light on the puzzling winter recession of poliomyelitis in temperate regions. Studies of the virus content of sewage have shown that this recession does not consist merely in the disappearance of recognisable clinical cases but is associated with a striking reduction in the viruses excreted by the general population. The Eskimo outbreaks raise some ticklish questions. Why, for instance, when the general attack-rates were so high, did children under 3 years entirely escape? Does the preponderance of lower-limb paralysis indicate that the central nervous system was invaded by virus from the intestine? Why was paralysis much more common in the left arm than the right? Why, even in severe cases, was there no cerebral or midbrain involvement? The exceptional way of life and unusual racial characters of the Eskimo may suggest speculative answers to these questions; but, as in much else connected with poliomyelitis, hypothesis is easier than proof.

Annotations

STUDYING THE FORM

THIS week brings disappointment to practitioners who ve hoped that the findings of the Inter-Departmental mmittee on Medical Certificates would promise notable lief from clerical work. Perhaps the most important commendation in the committee's report, which is mmarised on another page, is that National Insurance rtificates should be used for more general purposes an at present; certificates for employers might, it is ggested, be obtainable through the local National surance office. Otherwise the committee confines elf largely to enunciating broad principles and to scribing the many certificates and forms which the ctor may have to complete. On some of its specific commendations action has already been taken. The ggested statutory limitation of the certificates which e practitioner must provide without charge to his ational Health Service patients is provided for in the nending Act which was passed this month: and in veral instances proposals for the prolongation of a rtificate's validity or for the acceptance of alternative idence have been adopted.

If the report proposes no great relief, it at least nderlines the complexity of the problem under review. he committee heard evidence from no fewer than venty-seven Government Departments; as the report ints out, only these Departments can judge whether particular form or a particular question is indispensable, nd reduction in their demands must depend largely on eir own good sense, perhaps aided by a permanent pert committee. Rationing accounts for some of the eavy burden; but the truth is that nowadays few ctivities, whether Governmental or not, can be conducted ithout repeated calls on the doctor for certificates of ckness or of fitness; and the committee's report shows at while the forms might sometimes be more simple nd uniform, very few can certainly be abolished. robably no other professional man spends so much me as the [illegible] cal practitioner in clerical work of this rt. Y [illegible] ofessional time on the present scale is not inevitable. It could, for example, be curtailed by the provision of clerical assistance. In this respect the Minister of Health now has a clear responsibility, for he should be interested not only in providing medical attention under the National Health Service Act but in providing enough medical attention. The first step is clearly for each Department, having examined the joint committee's report, to search its conscience. The next should be for the Ministry of Health to analyse the cost in money and the economy in professional time from a routine which relieves the doctor of the task of actually filling in the various certificates and forms. The place for such a survey is a health centre; yet, even now, there *are* no health centres.

THE BACTERIAL NUCLEUS

THE "practical" (or, more correctly, "medical") bacteriologist probably uses his microscope less and less. Colony form, biochemical activity, and such technical tricks enable him to identify this and that as the cause of disease; and his interest is directed—always provided they will grow on his culture media—to problems of parasitism rather than to the anatomy and physiology of the humbler members of the vegetable kingdom. But lately other bacteriologists, who, presumably to avoid confusion, now call themselves "microbiologists," have introduced or revived microscopical techniques to throw light on subjects which their colleagues have either taken for granted or ignored. Of these subjects few have received more attention than the existence of a nucleus in the bacterial cell, and the part that such a body plays in reproduction and, possibly, in the transmission of heritable factors. It may now be said that some bacteria, if not all, contain bodies with most of the characters of the nuclei of other cells, and the recent paper by Bisset[1] not only extends this claim to *Bact. coli*, but by argument and photographic illustration must go a long way to convince the doubters. The resting cell contains a "microcyst," within which is a nucleus. As vegetative growth proceeds this nucleus takes the form of several chromosome-like bodies, which, so long as active growth continues, multiply both

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[1] Bisset, K. A. *J. Hyg., Camb.* 1949 **47** 182.

River Pollution

OUR highway law is still based upon a pre-Victorian statute of 1835; our public-health code, enacted in 1875, was not rewritten until 1936. Perhaps therefore it is not surprising that our present provisions for preventing the pollution of rivers were passed as long ago as 1876, or that the important report[1] of the rivers pollution prevention subcommittee of the Central Advisory Water Committee recommends that this old law should now be modernised and strengthened.

Much is hoped of the river boards recently established under the Act of 1948 on the admirable principle that every river (or, in some cases, groups of rivers) shall have a single administrative authority, based on catchment areas and not on local-government units, responsible for its condition from source to sea. One of the recommendations of the report is that effluents discharging into a stream or river should be made to comply with standards prescribed by these river boards. These standards would be stated in by-laws, subject to confirmation by the Minister of Health, under a procedure which would allow a prior hearing to interests likely to be affected. The standards would not be uniform but would vary from river to river. Under the Act of 1876, legal proceedings for pollution by trade and mining wastes are not to be taken unless the central department consents. The report advises that, once the standards have been prescribed in consultation with industrial and other interests, the Minister's consent should not be required before a prosecution is undertaken. Another recommendation is that river boards should have power to control new openings for the discharge of effluents into a stream or river, and that they should be given notice of proposed changes in existing discharges. The report suggests that by-laws might prescribe standards of temperature at which liquids may be permitted to enter a stream. An appendix gives details of the ascertained effect of discharging pure but heated water into streams already in some degree polluted. Organic matter so discharged in sewage effluents or in industrial wastes from dairies or beet-sugar factories undergoes oxidation at the expense of the oxygen dissolved in the water. The rate of oxidation rises with increase in temperature over the range ordinarily found in the river. Sometimes the water in a stream or estuary may be almost saturated with dissolved oxygen in the coldest months of winter and almost devoid of oxygen in the hottest part of summer. The temperature of a polluted stream is also of very great importance to its fish life.

It is true that the Act of 1876 is not the only source of law for checking river pollution. There was an amending Act in 1893. There are useful clauses in the Salmon and Freshwater Fisheries Act, 1923, to punish the intrusion of liquid or solid matter into water containing fish so as to make it poisonous or injurious to fish. There is section 259 of the Public Health Act, 1936, which directs local authorities to detect and deal with any watercourses so foul as to be prejudicial to health or a nuisance. There are anti-pollution provisions in the Water Act of 1945 and the Gas Act of 1948. More important still, many progressive municipalities and county councils have persuaded Parliament to allow them to advance ahead of the general law; their experimental legislation may well be ready for universal adoption. Somehow one gets the impression that there are too many enactments on the subject, perhaps also too many Ministers concerned, and also that the law has either timidly bought off opposition at the cost of sanctioning exemptions for trades and businesses and mines and railways, or else has expressed itself in terms so uncompromising that nobody cares for the adventure of enforcing it. The most promising aspect of the recent report is that the members of the subcommittee were drawn not only from the associations which represent local authorities, catchment boards, and fishery boards but also from the Federation of British Industries, and that their conclusions are unanimous. The organisations which contributed written or oral evidence included the National Coal Board, the British Electricity Authority, and bodies representing canals, field sports, landowners, launderers, and ramblers. All this amicable discussion may eventually yield better results than fresh statutory prohibitions.

Arctic Poliomyelitis

As everyone knew would happen, this year's high incidence of poliomyelitis—second only to that of 1947—has fallen with the coming of colder weather. And nobody has been surprised that the unusually prolonged summer was parallelled by an unusually protracted epidemic. For here, as in the U.S.A. and Australia, epidemic prevalences in the late summer and autumn months have always declined with the approach of winter. This seasonal rise and fall, so far unexplained but often thought to offer a possible clue to the mode of spread of epidemic poliomyelitis, is not universal. For instance, in Iceland, which at times is more severely affected by poliomyelitis than any other country in the world, the incidence has sometimes reached its maximum in the winter; and during the late war the serious epidemic in Malta began in November, 1942, and lasted until the following March. Even so, it was rather astonishing to hear[1] that two outbreaks occurred among isolated Eskimo communities in the Arctic regions of Canada during the winter of 1948–49, which was one of the coldest ever known

The affected communities live on the western coast of Hudson Bay or in its hinterland, between latitudes 60° and 65°N, which is as cold as any part of the Arctic mainland and feels colder because of constant winds. In this severe winter the temperature fell as low as —49°F—i e, 81° of frost. In the first outbreak, which affected a group of four trading-posts with a combined population of 500 Eskimos, between September, 1948, and March, 1949, there were 21 cases with paralysis and 4 deaths. In the second outbreak, at Chesterfield, a trading-post farther north, in February (the coldest month of the winter) there were 39 cases with paralysis and 14 deaths among a population of 275; including the non-paralytic cases the attack-rate was at least 50%. Poliomyelitis probably spread to the Eskimo communities involved in the first outbreak by ship from a military installation at Churchill a hundred miles or so to the south, where a case with paralysis occurred in July, 1948. The only known link between the first and the much more severe second outbreak was

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[1] Prevention of River Pollution. H.M. Stationery Office, 1949. Pp. 76. 1s. 6d.

[1] Adamson, J. D., Moody, J. P., Peart, A. F. W., Smillie, R. A., Wilt, J. C., Wood, W. J. Canad. med. Ass. J. 1949, 61, 339.

Points of View

ARMY MEDICINE IN THE LATE WAR

SOME MISTAKES OF POLICY ?

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(Concluded from p. 1198)

4. Medical Classification and Disposal

WHEN studying a potential recruit, the obvious question : "Is this man likely to be useful to the Army in any which is at present short of personnel ?" But in the members of selection boards were not allowed ask this question. It was laid down that certain defects or diseases were an absolute bar to admission to the Army, irrespective of the individual's abilities. And large numbers of excellent men were kept out of the Army because of such findings as high blood-pressure, varicose veins, flat-feet, or missing fingers.

In my view even severely diseased or disabled men need not have been kept automatically out of the Army. If such men could do useful jobs in civil life. they could commonly do the same when soldiers. The widespread assumption that life in the Army is necessarily much harder than civil life and requires a higher standard of health is false.

For example, during the war the life of the average medical officer stationed at a military hospital in England or in base areas abroad was very easy. He was usually stationed in the country, and had little to fear from the bombs of the enemy ; his hours were often short and usually fairly regular ; he rarely left his bed at night except when orderly officer, perhaps once a week (and even then he was often left undisturbed) ; he had frequent leave ; he was untroubled by problems of rationing and provided with plentiful food ; and he was usually comfortably housed and given a batman to look after him. By contrast, his brother in general practice was nearly always overworked and had his nights constantly disturbed, if in a large town was often bombed, rarely if ever had a holiday, and in every way led a hard and difficult life.

Although medical officers were admittedly a privileged body, the same considerations apply, if in less degree, to the vast numbers of clerks, cooks, and technicians of all kinds needed in the modern Army, and also to many combatants, such as heavy anti-aircraft and Coast Defence gunners, and the great majority of the non-flying personnel of the R.A.F.

The following case illustrates what everyone knows—at least if the matter is not being considered from a "medical" standpoint—namely, that the psychological qualities are of overriding importance by comparison with the physical in determining a man's excellence as a soldier.

An officer who had served with distinction in the first world war lost an eye, sustaining such severe damage to the orbital bones that he was never able to wear a glass eye but had to use a shield instead, and leaving behind chronic osteitis necessitating numerous operations for the removal of sequestra. During that war he also developed two herniæ and a duodenal ulcer which was treated by gastro-enterostomy. As he continued to have severe ulcer symptoms, including several hæmatemeses, he was finally awarded, round about 1924, a 100% disability pension. When the second world war started he succeeded in getting himself into the Pioneer Corps without seeing a medical officer. He went to France but was taken prisoner during the German invasion. After a year in a prison camp he escaped with 15 men and succeeded in conducting them all to Gibraltar, the party negotiating the Pyrenees in mid-winter. For this feat he was awarded a bar to the Military Cross he had won in the first world war.

CATEGORISATION AND DISCHARGE DURING THE WAR

Soldiers were classified largely according to structural defects. It was not even left to the medical officer's or board's discretion to judge the significance of some defect in any particular case, for there were a number of cut and dried instructions on the matter. The man blind in one eye was automatically put in category B.3, which meant that he could never belong to any kind of fighting unit in the field. There were similar regulations in respect of such disorders as perforated ear-drums, flat-feet, and knock-knee, and in India a further series of regulations referred to enlarged spleens, stones in the urinary tract, and other conditions common in the tropics. When sitting on a medical board one used a form entitled "form for the medical recategorisation of a soldier." In fact, when dealing with a man affected by one of these conditions which had been the subject of a regulation, one was not allowed to recategorise *a soldier* ; all one could do was to recategorise a tympanic membrane, the first part of a duodenum, a spleen, a big toe, or the lens of an eye.

Naturally these regulations had absurd consequences.

In one unit to which I was attached we had nine R.I.A.S.C. drivers. All had perfect vision, excellent arches to their feet, hæmoglobins of 100%, two testicles in their scrotums, impalpable spleens, and mobile joints. Indeed, they had but one defect ; they were incapable of driving. Three smashed so much valuable Army transport that the C.O. permanently forbade them from driving any more, and another three were only allowed to go on specified easy journeys. But fortunately we had a nursing orderly in the unit who, though blind in one eye (and therefore "unfit" to drive), was a superb driver, his peace-time job consisting in driving lorries through the Highlands of Scotland. He was therefore given a stripe and put in charge of the unit's transport.

An ex-Territorial warrant officer had had a perforated ear-drum for many years. During the first four years of the war this lesion was fortunately overlooked, and it never caused him any trouble. As the result of a slight and transient aural discharge he was referred to an E.N.T. surgeon, who, obeying his instructions, recommended him to be recategorised to B.1. I presided over his medical board. His first anxious remark was : "You aren't going to lower me in category below A.2, are you, Sir ?" For he was the sergeant-major of a battery which he had helped to raise, and was most distressed at the thought that he might have to be posted away, as would be necessary if his category were lowered to B.1. Rarely did I have such pleasure in disobeying a regulation, and rarely did I see such gratitude from a soldier having a medical board.

Throughout my military career I saw large numbers of soldiers who, because each of their limbs, systems, and organs were structurally normal, had been placed in category A.1, and yet had never in fact succeeded in performing the dutes of an A.1 soldier, although belonging to active units. Given up as hopeless early in their military careers, they would spend their time when on duty in such unmilitary occupations as mess waiter, batman, or latrine orderly, while many had spent long periods away from military life, absent without leave, in prison or detention barracks, or in hospital.

The practice of ignoring the man but of concentrating all the attention on the parts of his body was also illustrated by the rule that soldiers could only be lowered in category or discharged at the recommendation of a specialist. If a man's foot was troublesome he had to be seen by an orthopædic surgeon ; if his nose, an E.N.T. specialist ; if his abdomen, a physician. Yet to assess a man's value as a soldier it would be absurd to pretend that a specialist was necessary, so this rule implied that the military value was of no importance. Many specialists, after the most exhaustive study of the region in which they specialised, would return a man to his unit with the statement that he had "nothing the matter," though the man was in fact utterly useless as a soldier.

sexually and asexually. As multiplication slows down, these bodies revert to the microcystic form, either directly or through the stage of a larger non-cysted nucleus. Such is a bare outline of Bisset's demonstration, which without his illustrations sounds bare and unconvincing. It is true that the evidence is based on the examination of stained material under a high magnification, and neither staining reactions nor nuclear division can by themselves justify the supposition that the processes observed by Bisset are identical with those seen in the larger cells of higher organisms. But the resemblance is there, and it deserves attention from a wider circle than the microbiologists, and an adjective more complimentary than "suggestive." Whether optical skill can carry the matter further we do not know, nor have we the knowledge to suggest investigations on the function of these bodies. Has all this anything to teach the medical bacteriologist? Apart from its value as a sermon on the virtues of mere curiosity, perhaps not; but there may come a time when new knowledge of bacterial heredity will have a startling impact on the theory and practice of epidemiology.

CRUELTY TO CHILDREN

PARLIAMENT has decided that a committee should be set up to inquire into the extent to which children in their own homes are neglected and cruelly treated. Such children are out of reach of the measures designed to protect children who are deprived of a normal home life, because they still have both home and parents; and one of the questions which the new committee will have to decide is whether officials should be given the right to enter the home to inquire into such cases, and what measures can appropriately be applied to protect the child and correct the parents. In this country we have always felt that the home should be forcibly invaded by officials only in the last resort—only, in fact, when a crime is being committed. It may fairly be argued that when a child is suffering cruelty, even at the hands of his own parents, then a crime is certainly being committed, and the right of entry can be justified. But in many cases the child is suffering not because his parents are cruel but because they are unequal to their responsibilities. Mrs. Ayrton Gould, who moved that the committee should be set up, quoted the case of a woman whose husband was serving a long term of imprisonment. Her six children were ill-fed, dirty, and verminous, and the whole family lived in a slum. She welcomed the help of the welfare officer, allowed five of the children to go into a local-authority home, and herself went into a voluntary home for the recuperation of mothers, taking the baby with her. After two months she was fit enough to go home and look after her children, and anxious to do it; and moreover she had been taught something about mothercraft. It is hard to see how official right of entry would have helped in such a case: the mother was ready to respond to the offer of help without coercion.

It seems that most of the cases will fall under this heading. The Women's Group on Public Welfare[1] found last year that the parents, and especially the mother, are more often poor, incompetent, ill, and fatigued than deliberately neglectful or cruel. Though 75% of a group of mothers in prison for child neglect were below the average in health when sentenced, not one of them had thought of pleading this as a cause of her failure—though many of them blamed bad housing and lack of money. In such cases the mothers are the victims of our own failure, and their children are secondary sufferers. This kind of neglect must be sharply distinguished from deliberate, or half-deliberate, cruelty. The neglected child and his parents may be closely attached to each other, and far greater harm will come to the child by removal from them than by physical neglect, bad as this is. On the other hand, where the child is being terrorised by a brutal or drunken parent or step-parent, the community should clearly be able to protect him. This very work has been done for 65 years by the National Society for the Prevention of Cruelty to Children, as Mr. Wilton McCann, the director, points out in a letter to the *Times* (Dec. 12); and it may well be best for such a voluntary society to carry on with a task which calls for so much personal judgment. He notes that of the 40,246 cases dealt with by the society last year, only 626 required a prosecution.

The committee's deliberations may indeed lead them to decide that this work must be done by a voluntary body rather than by statutory officials; but they must also consider what supplementary services the society needs to carry on with this work, and do it even better. First among these must surely stand mothercraft training homes—such as those founded by the Society of Friends, the Community Council for Lancashire, and the Salvation Army—in which the mother can live for a while with her children and learn to care for them properly. Housing difficulties must also be considered carefully, for a neglectful mother has even less chance of being rehoused than a capable one. The committee will also be able to establish another important point—whether cases of cruelty are increasing or getting fewer. In the House of Commons debate some held one view, some another.

MORPHINE ON THE MOUNTAIN

MORE than once the publicity of legal proceedings has been deliberately courted with the aim of putting an end to anomalies in the law. The latest instance has been provided by Mr. Wilson Hey, the Manchester surgeon, who invited prosecution under the Dangerous Drugs Acts for having supplied morphine to trained mountain rescue parties, in accordance with the policy of the Mountain Rescue Committee. Mr. Hey had twice applied for sanction of a direct supply, but without success, and on Oct. 26 he was fined by a magistrate.[1] At his appearance in court, Mr. Hey pointed out that mine rescue parties were already officially allowed to carry morphine. The mountaineer's claim to this concession seems hardly less strong; without the benison of morphine at hand, the severely injured climber usually faces a long and painful descent over a hill track as the alternative to waiting, possibly in wind and cold, until the nearest doctor reaches him.

Now the Home Office has notified the British Mountaineering Council of new arrangements which have been authorised. Morphine in gr. $^1/_4$ ampoules, up to a total of gr. $^3/_4$, may be packed in the standard mountain first-aid equipment which is stored at each of the first-aid posts formally established by the Mountain Rescue Committee. The morphine will be in the charge of the supervisor of the post, who will obtain replacements through a local general practitioner, accounting to him for ampoules used or rendered unserviceable. The council will supply to the Home Office a list of the first-aid posts, and will also furnish a statement each year of cases where morphine is used. The ampoules will be accompanied by printed instructions for administration and by a tag, for attachment to the injured man, on which the quantity administered together with the date and time will be recorded. At one post in an untenanted hut the emergency equipment, including the morphine, is to be kept in a locked cupboard which can be opened by a key stored in a glass-fronted box of the fire-alarm post type. The council is free to improvise forthwith arrangements along these lines.

WE regret to announce the death on Dec. 20, at the age of 45, of Dr. W. H. Newton, professor of physiology in the University of Edinburgh.

Children in Need. London: *Allen & Unwin. 1948.* See also *Lancet, 1948, ii, 63.*

1. See *Lancet, Nov. 5, p. 850.*

A preliminary way of assessing a recruit's military
, which has the virtue of extreme simplicity,
study of his performance in civil life—either taken
his history as given by himself or from reports from
employers. At present many soldiers have to per-
skilled trades similar to those of civil life. There
be no more convincing testimony of the suitability
man for the Royal Corps of Signals than that he was
'y efficient Post Office engineer, or for a commission
the R.A.M.C. than that he was a sound general
tioner.

regards the particularly military activities, such
marching in full kit, throwing hand-grenades, and
a rifle, useful information may also be obtainable
imes from a recruit's previous career. But in
respects the best time to classify recruits is towards
end of their period of preliminary training. A
d could be made of each man's ability in the more
rtant military activities, and from these records
authorities could decide which men should
sent to the infantry, which to the artillery, and
so on.

But even tests such as these do not give precise information about the functioning capacity of a soldier in *action*. And the only absolutely reliable way of assessing this—by putting him into action and observing the results—is obviously unsatisfactory, since so far as is possible men who are going to fail in battle should never be allowed into action at all. Moreover, in peace-time there can be no question of putting men to the practical test of fighting.

The qualities which cannot satisfactorily be tested on the training-ground, but which may cause a man to fail in battle, are the psychological qualities. An attempt should therefore be made to assess these qualities in all recruits, and they should be graded accordingly—though this is admittedly very difficult. The PULHEEMS system, by its admission of the quality S (emotional stability) certainly stresses the importance of character and temperament—in contrast to the previous system of categorisation. But under this system the assessment is made by a medical officer. Even if, with all the facts before him, a medical officer were able to make a better assessment than a non-medical officer (which is doubtful) his opportunities of studying recruits are so small that the opinion of the officer in charge of their training should be the determining factor.

In the Services a number of men are engaged in more or less highly skilled occupations, such as aeroplane pilots or tank drivers, which are rare or unknown in civil life. A recruit's civilian record, therefore, can give no direct information as to his ability in these occupations, and for obvious reasons all recruits cannot be tested in their actual performance. Means of selecting men for training in these occupations are, therefore, important. Intelligence and aptitude tests are doubtless very useful, and an assessment of character and temperament should be made as well. Consideration should also be given to certain separate bodily functions, notably the sight. Thus, whereas an exact standard of vision should not be laid down in respect of shooting (since the matter can easily be tested with a rifle and target) it is reasonable to insist that men with uniocular vision should not be trained as pilots. Similarly, it is perhaps sound practice not to train men with uniocular vision as truck-drivers—unless *they have already learnt to drive in civil life*. Nevertheless, hard and fast standards should still be avoided, since a man with some slight defect of vision but of strong personality will be more likely to make a successful pilot, say, than a man with perfect vision but of weak personality.

As previously noted, there is legitimate place for a medical opinion in assessing men's likely future capacities as soldiers. It would be proper, therefore, for each recruit to be seen by a medical officer who would supply a certificate of the following kind: "This man is not (or is), or has not been (or has been), affected by a disorder likely to recur or progress rapidly if he is a soldier." When this certificate is in the negative, no further medical action is needed. But when in the positive, the subject could rightly be brought before a *medical* board—or, at least, a board containing one or more medical men. The board could attempt to prophesy the likely rate of progression of the trouble, or the likelihood of recurrences, in a variety of circumstances of Army life, and decide whether any treatment practicable in the Army would influence future developments. Thus, it might be deduced that a man subject to eczema would probably suffer bad relapses in a tropical climate, and should therefore be kept in temperate zones. Cases which would form a problem here are those which it might be alleged would be damaged by the "strain" of Army life. For example, many doctors would say that the symptom-free subject of rheumatic heart-disease would be likely to develop cardiac failure if put into the infantry, though able to perform all the duties of an infantryman without distress. But good evidence to support this view is lacking. The statement that, in general, if a man is capable of certain duties there is no reason why he should not perform them seems sound. Even if it is probable that some individual would be harmed by the military life, this is hardly a sufficient reason for keeping him out of the Army in war-time. The additional hazard to him is surely a trivial matter by comparison with the enormous hazards freely taken by such men as the flying personnel of the R.A.F., submarine crews, and paratroopers. They are honoured for volunteering for their dangerous occupations; why, then, should a man with a raised blood-pressure be prevented from taking the slight risk involved by his joining, say, the field artillery?

Even when assessing such cases as these the problem whether or not to admit a recruit should not be considered wholly "medical." For one man with a specified liability to a certain disorder may be a most useful addition to the Army, either because of his other excellent qualities or his previous training, while another similarly affected man lacking these advantages may rightly be refused admission. Hard and fast rules excluding all men with certain disorders from the Army (such as those relating to peptic ulcer) should therefore be avoided. They can also be condemned from a purely medical standpoint, for most diseases vary infinitely in their course and severity from person to person. It is no doubt sound to keep a man out of the Army who is liable to frequent epileptic fits or has had numerous hæmatemeses over a short period. But another man of similar personality and qualifications who has had five epileptic fits in his life, the latest two years previously, or has suffered from a duodenal ulcer for one short period three years before, may be well worth recruiting.

After men have passed through the initial stages of their training and are attached to active units, there is no need as a rule for special tests to assess their functional abilities as soldiers. For they are continually undergoing the best test of all—that of carrying out the duties for which they are in the Army. A report from a commanding officer that a soldier has been tried and found wanting should, therefore, provide a supremely important ground for discharging him from the Army or transferring him to different duties. In action such a report should carry even greater weight than in training. There should, as I have already said, be two routes for evacuating men from the battle-line—the medical route for the acutely sick and wounded, and the non-medical route for the incompetents.

I do not suggest that the word of a commanding officer alone should settle the matter. Not every C.O.

As the war went on there was an increasing number of psychiatrists in the Army, and an increasing proportion of men were discharged or recategorised on psychiatric grounds. It could not be objected that psychiatrists did not take a soldier's military value into account, for they insisted on having a report on it from his C.O. But it must be wondered what was the need of the psychiatrist. For if the C.O. said the man was a useful member of the unit and the psychiatrist recommended his discharge from the Army, the latter was clearly wrong—as he was if the C.O. said the man was useless and the psychiatrist *recommended no change in category*. Indeed, in the matter of boarding the chief function of the psychiatrist *was to rubber-stamp the advice of C.O.s*, though he might have the added function of suggesting appropriate duties *for men found unsatisfactory in their present units*.

The high proportion of psychiatric discharges aroused much comment. "The statistics," says Adrian (1948), "are certainly rather alarming. It has been stated, and not contradicted, that from a third to a half of all medical invalids discharged during the war were discharged on psychiatric grounds. . . ." These figures seem to have proved: to psychiatrists that psychiatry is important; to the "tough old school" that these damned trick-cyclists are getting too influential; and to many ordinary people that the state of England's youth is very poor. Yet the figures simply reflected the introduction into the Army of the practice—universal in civil life—of judging a man not by his organs but by the way he does his work. It is taken for granted that the reason why a civilian is sacked is that he has a psychiatric defect.

Personally I always tried to frame recommendations about discharge from an assessment of the soldier's military value, to the extent that the regulation allowed, or could be ignored or circumvented. Leaving aside cases of severe maiming from battle wounds (with which I had little connexion) and perhaps pulmonary tuberculosis, I rarely saw a soldier whose *bodily condition alone* seemed to provide sufficient grounds for advising discharge from the Service. This does not mean that I rarely recommended discharge except by a psychiatric diagnosis; indeed, not being a psychiatric specialist I was not allowed to do this. A considerable proportion of the chronically useless soldiers had some organic lesion which could be made the nominal "disability" necessitating their removal from the Army; and otherwise there were plenty of labels, such as effort syndrome, chronic gastritis, chronic dyspepsia, second-grade constitution, or chronic fibrositis, which could be used for the same purpose.

THE PULHEEMS SYSTEM OF MEDICAL CLASSIFICATION

Since the war the PULHEEMS system has been introduced into the Army, and also into the Navy and Royal Air Force. Under this system the individual is examined with reference to seven subdivisions of bodily or mental function, the initial letters of which go to make up the word PULHEEMS, as follows:

P = Physical capacity.
U = Upper limbs.
L = Locomotion.
H = Hearing.
EE = Eyesight in each eye.
M = Mental capacity.
S = Stability (emotional).

There are 8 degrees under each quality, from the highest, 1, to the lowest, 8, though in the case of some qualities several of these degrees are not used in practice. Men of degree 8 in any quality are not normally accepted for service.

In the official instructions about the application of PULHEEMS, the importance of function, as opposed to structure, is stressed. Thus, it is said that: "T *decision (as to classification)* should be based primar on function, that is, the capacity to perform the wo involved in a *given type of duty*"; and, with referen to locomotion, "it is important that it be clearly und stood that L refers to the functional efficiency of the man locomotive system and not to any anatomical defect. . If the man can march with efficiency this will be express as L1 or L2, whether his feet are æsthetically pleasi or not."

These last sentiments are admirable. Unfortunatel the PULHEEMS instructions proceed to describe ho in many ways, the decision as to the degree und each quality should *not* depend on function. For examp in respect of P (physical capacity) it is said that, to graded *P1*, a man "should be above the average physiqu Height-weight ratio should be within the normal limi and chest measurements and expansion proportiona to build. General muscular development above averag . . ." In another place appears the *following* "Assessment of the man's physique is to be based upo careful observation of such general things as apparen muscular development, age, height, weight, and th correlation of these; potential ability to acquire physica stamina with training." Similar statements are give about the other degrees. It is also laid dow categorically that "evidence of mitral or aortic incom petence is a reason for placing in P8"; with referenc to varicose veins, that "lesser degrees of varicosity ma allow of P3 or P6. Minor degrees giving no troubl may admit of P3 or even P2"; and that "strabismu present in either eye will not be assessed *higher tha* P3."

Thus, in spite of the repeated stress as to the import ance of function, medical officers are compelled to considerable extent to ignore function and *act on struc* ture when assessing soldiers' PULHEEMS. Even if th eight qualities are all considered from a fully functiona standpoint, the system may still be criticised on the grounds that it takes no account of the function which really matters—that is, the *function of the whole man as a soldier*. An infantry unit needs men who are brave and resolute, are able to march long distances with full kit, and are accurate shots with rifle and other small arms. It is of small moment that such men are unable fully to extend their right elbows or flex their left knees, or are hard of hearing. A medical unit needs medical officers who are intelligent, possessed of a sound knowledge of medicine, hard-working, and able to inspire confidence in patients. It matters little that they should be missing one leg, one kidney, one eye, and one ear. Even if it is conceded that deafness in an infantryman or the absence of a leg in a medical officer are, other things being equal, a handicap to the efficient execution of their duties, these defects are trivial by comparison with their other qualities. The commander of a battalion, if given the choice between a brave, trustworthy, but deaf, man and a coward with perfect hearing would unhesitatingly choose the former. The PULHEEMS system, just like its predecessor, compels him to take the latter.

A SUGGESTED APPROACH TO CATEGORISATION AND DISPOSAL

Perhaps the fundamental error behind both the old and the new methods of classifying soldiers is that they are *medical* methods. For classifying men according to their functioning capacities as soldiers clearly does not require the services of a doctor. A doctor is needed in this connexion only to assess men's probable future functioning capacities. His opinion is not required except in the case of men suffering from, or thought likely to suffer from, some progressive or recurrent disorder.

man possibly be trusted in circumstances which are e to shatter the nerve of even the best type of soldier ? And is he not in the heat of action apt to be a hindrance to his fellows, and even perhaps to cause them to become alties ? Indeed, if anyone should be kept out of the battle-line, it is he. True, he should not be *invalided* out of the Army or lowered in *medical* category he often was in fact) but dismissed with dishonour. d. in so far as there is any truth in the view that gering can become infectious, the worst cases could sent to prison before their final removal from the y. with the object of discouraging others.

Perhaps another reason for the objectivity of the schemes of medical classification lay in the belief that to be objective is to be fair. During the war, when the try was in grave danger and nearly everyone was conscripted in some sort of way, it was an understandable feeling that it would be unfair to leave the individual to decide whether he should be a front-line soldier or not. When sitting on medical boards I commonly had arguments with fellow members who might say : " It would be damned unfair to let this dirty little so-and-so out of the Army when all the good chaps have to stay in and do their bit. I won't be a party to letting him escape." But this emotional attitude is quite indefensible. The object of classification should be to make the Army efficient, and the question of fairness is irrelevant (except in so far as a widespread *feeling* that there is much unfairness makes for inefficiency). Moreover, all the most dangerous jobs in the Services—submarine crews, flying personnel, parachutists, and commandos—were open only to volunteers ; and no method of selection could be more " unfair " than this.

Finally, a partial explanation for the Army policy of refusing to accept recruits with abnormalities is apparently to be found in pension considerations. A man who is admitted with a minor degree of hallux valgus which is causing no trouble may later develop (or maintain that he has developed) severe pain in the affected foot, preventing him from marching. He will then have a very strong claim for a pension on the ground that he has " a disability aggravated by military service." But even in peace-time this policy of refusing many excellent men because of the chance of one later behaving in this manner seems unjustifiable. In war-time, when vast sums of public money are being poured out in the prosecution of the war, and the number of people on the books of the Ministry of Pensions is inevitably enormous, the policy is absurd.

5. Implications for Civil Life

IF correct, the conclusions reached in this review of certain features of Army medicine have important medical and non-medical implications for civil life.

DIAGNOSTIC CRITERIA

The official Army attitude towards the diagnosis of malaria and amœbiasis exemplifies the widespread tendency in the medical world today to pay less attention to clinical findings than to the results of special investigations. Perhaps the fundamental reason for this tendency is that special investigations yield *objective* criteria. There is something attractive about a positive Wassermann reaction, a notched R wave in an electrocardiogram, a blood-sugar figure of 321 mg. per 100 ml., or the hæmolytic streptococci which are grown from the tonsils. For their reality cannot be questioned ; and they provide concrete evidence. Symptoms, on the contrary, are commonly so vague that it is very hard to be sure just what the patient's complaints are ; and even if the history is apparently definite, it is still somehow an intangible thing by comparison with a blood-urea of 180 mg. per 100 ml. or a polymorphonuclear leucocytosis of 21,000. It is true that many physical signs have not this " drawback," an enlarged spleen, a temperature of 103°F, or a diastolic murmur being just as objective and satisfactory as the flick of a muscle on galvanic stimulation or a titre of 1 in 1024 of *Bact. typhosum* antibodies in the blood-stream. But physical signs are probably wrongly emphasised just as often as the results of special investigations. (The attention paid to systolic murmurs some years ago is a good example.) The error in modern medicine which is being considered here, therefore, is the neglect of symptoms, rather than the neglect of clinical findings as a whole.

Platt (1947) says : " It has seemed to me for a long time that good doctors differ from bad ones in two major respects. The time they devote to history-taking and their ability to interpret a history correctly is the first. . . ." Later he adds : " Far more mistakes are made by putting too much significance upon doubtful physical signs and neglecting the clear indications of the history than by the opposite process." and he goes on to point out that in a high proportion of cases the correct diagnosis can be reached from the history alone.

In the study of acutely ill people the symptoms can be of great value in suggesting the diagnosis, or at least in suggesting the region where the lesion is to be found. But it is in the study of the chronic case that the history becomes very often of supreme importance. For deducing the cause of the symptoms—and this is the essence of diagnosis—is rarely the simple process of discovering some lesion. It involves, in addition, asking : first, whether a lesion which is known to be present is at all related to the symptoms (for incidental chronic lesions are common) ; and second, if this question is answered affirmatively, to what extent the symptoms can be ascribed directly to the lesion and to what extent to the state of mind (for the symptoms of many among the chronic sick with organic disease are predominantly or largely of psychological origin). Concentrating on the physical signs and investigations and neglecting the history can lead to the gravest errors. The bald diagnoses " mitral stenosis " or " anæmia " may be made when in fact the cardiac lesion or the state of the blood have little connexion with the symptoms, which are mainly emotional. The diagnosis " gallstones " may be made on the strength of shadows on the X-ray plate, when in fact these stones are causing no trouble and the real diagnosis should be " duodenal ulcer." The diagnosis " ankylostomiasis " may be made because of the finding of ankylostoma ova in the stools, when the symptoms are really due to amœbiasis. And the vast number of false " organic " diagnoses, such as visceroptosis, hyperchlorhydria, intestinal auto-intoxication, hypotension, strained heart, weak heart, and disordered action of the heart, which I have enumerated elsewhere under the title " The black chapter of medicine " (Todd 1949), can be made only by those who ignore the symptoms and concentrate all their attention on the physical signs and the results of special investigations.

The actual process of analysing persistent symptoms can also be most tedious and difficult. Very often a lengthy interrogation is needed before one even begins to appreciate what the patient is really complaining of. Among the chronic sick one of the commonest complaints is of feeling " generally unwell." Only after long questioning may it become evident that the real trouble of one patient with this complaint is mental depression, and of another generalised bodily weakness. As regards the chronic case, Platt seems justified in thinking that " good doctors differ from bad in the time they devote to history-taking and their ability to interpret a history."

ABUSE OF HOSPITALISATION IN CIVIL LIFE

In view of the practitioner's difficulty in getting his patients into hospital, the long waiting-lists in many is necessarily all-wise. Sometimes, indeed, an important reason for a soldier's incompetence is the attitude of superior officers who dislike and cannot handle him; if given better officers he may become an efficient soldier. Probably a satisfactory arrangement would be to bring together in appropriate units all the men who had been dismissed from their own units on the grounds of uselessness. There, with the aid of detailed reports under various headings from their commanding officers, observations on their behaviour by the personnel of the disposal unit, and various functional tests, it could be decided whether the men should be discharged altogether from the Service. retained in some different capacity, or retained in the same capacity. To such a unit could also be sent, when they have recovered from their wounds, soldiers who have been maimed.

When men develop in the Army some such recurrent or progressive disease as peptic ulcer or amœbiasis, or a disease likely to be influenced greatly by climate or surroundings, such as "sprue" or severe fungal infections of the skin, their disposal becomes, at least in part, a truly medical problem. They should be dealt with as already described in connexion with potential or actual recruits affected by diseases of this kind. Again, of course, hard and fast rules relating to certain diseases should be avoided, for considerations other than medical should nearly always influence disposal.

A matter which should be considered in all these situations is the individual's personal desires. Obviously, in so far as men can be given the kind of duties they prefer, they will be more efficient and of better morale than if forced into activities they dislike. Recruits who are keen to become soldiers will, other things being equal, be better than those who abhor the idea of the military life. This factor seems of particular importance in respect of those who have been maimed. A man who has lost a leg but is keen on staying in the Army will probably be worth retaining in some capacity, if he is of fair or good intelligence; a similarly afflicted man who is anxious to return to civil life should doubtless be sent there. Yet, in all the vast number of regulations and instructions on medical classification in the Army in both the old and the new systems, I never found a reference to the personal wishes of the individual. I do not suggest that these wishes should always count for a great deal, for in war-time men must be conscripted, and comparatively few soldiers would choose the infantry. But I do think that they should always be taken into consideration, and that sometimes they should carry much weight.

DISCUSSION

The above opinions, though at variance with official teaching, are in no way original. My theme—that, in the Army, men should be classified according to their ability to function as soldiers—is essentially the same as the universally accepted assumption about employment in civil life. The employer when selecting employees does not send them to a doctor to see whether they have hallux valgus, flat-feet, or a perforated eardrum, but chooses those who, from their previous record and their general behaviour, seem most likely to be efficient at the work he wishes them to do; if men have to be dismissed, those who go are the least efficient, not those who have a varicocele, albuminuria, or an ingrowing toenail. Why then, it must be asked, did the systems of classification described in this paper ever come to be evolved?

In civil life, it may be answered, people are not forced into, and held in, occupations against their will; but men are conscripted into the Army, or, even if they volunteer, are compelled to remain soldiers for a fixed number of years. It is easy to deduce from this that a system of classification from an assessment of the function of the man as a whole, which depends on willing coöperation, cannot be satisfactory, since he be apt deliberately to function badly, so as to escape fr the Army altogether or escape from a fighting u Accordingly (it is said) there must be some object system of classification. When I used to advance view that if a soldier is useless to the Army, he sho obviously be discharged, I was—at least when statio in base areas thousands of miles from the enemy—so times answered by the retort: "Good heavens, if eve one knew that any lead-swinger could get his tic just by making himself inefficient, within a mo hardly any Army would be left."

To this it can be replied that even during the ea phases of the war some aspects of categorisation notably hearing and vision—depended on the coöpe tion of the subject; that later on intelligence tests, whi have the same "drawback," were universally use and that rejection and discharge on psychiatric groun became increasingly common. The PULHEEMS syste which stresses so strongly the function of various aspec of the individual, largely depends on the subjecti factor. Yet I have hardly ever heard of men deliberate pretending that they were less intelligent, or of poor vision or hearing, than they were in fact.

In the R.A.F. any flying man who reached the co clusion that he had had enough of the frightful hazar of his life could say to his C.O. that he was unable carry on any longer, and was then permanently tran ferred to ground duties, because of his "lack of mor fibre." Yet according to R.A.F. officers there was nev any suggestion that a flying man who was still capab of his duties would deliberately escape in this manne It is true that these men were all volunteers of goo calibre, and if grounded because of "lack of moral fibre were reduced to the rank of aircraftman. But if in th Army there had been a procedure by which men in th front-line infantry could have been made, say, clerks i the Pay Corps or nursing orderlies in the R.A.M.C. because of "lack of moral fibre," would men o sufficient character to be any use in action hav incurred the contempt of others by employing thi means?

So far from discouraging malingering, I believe tha the "objectivity" of the medical classification schem during the war had precisely the reverse effect. If, by repeatedly reporting sick, with, say, pain in the back, a man succeeded in getting himself invalided out of the Army, the solemn procedure of a medical board—consisting of three doctors, one at least a lieut.-colonel—was to inform him that he was *unfit for any form of military service* on account of chronic lumbar fibrositis. What could be more calculated to salve his conscience? Even though an uneasy voice at the back of his mind occasionally told him that his backache had not been so bad as he had said it was, a much louder voice could reply: "Three doctors have discovered that I'm unfit and they ought to know; I didn't ask for my ticket: it's not my fault that I'm back in civvy street." And his friends and relatives in civilian life would welcome him home as a hero, his health ruined by the hardships of military life. Whereas, if the process of getting out had been to be told, by a high officer: "You are a useless incompetent without the guts to deserve the honour of wearing the King's uniform," it seems most unlikely that many men would have been so base as deliberately to escape from the Army in this way.

The question of malingering can be looked at from another angle. Though the old sweat who reports to the M.I. room with a bad attack of "backache" on the day of a route-march may be quite a useful soldier in action, the habitual chronic malingerer must have a defect of character so gross as to be quite useless in battle. How could such

At least one disorder—epilepsy—may nevertheless the refusal to give even an adult certain occupa- ns, though the only person who can thereby suffer himself: if he works close to machinery or has to mb ladders he will be liable to kill or maim himself: d it seems reasonable to prevent him from doing this. iere may also be a strong case for stopping juveniles m damaging themselves. But to prevent a grown an from taking the job of his choice is as a rule a grave terference with the liberty of the subject. When note (*a*) that the prevention is done by a single edical examiner, against whose decision there is no peal; (*b*) that there is no clear knowledge of how uch different kinds of work may damage people with rtain diseases; and (*c*) that different doctors some- nes come to entirely different conclusions about the me case, the degree of this interference seems intoler- le. One often hears it said that the traditional erties of England are gradually being filched away. ut the kinds of things to which this statement refers, ch as the compulsory use of identity-cards, the striction in taking money out of the country, and the merous regulations of various Government depart- ents, seem trivial in comparison with the practice of rbidding someone to take a job because of the opinion a single medical man. It is strange that apparently voices have been raised in protest.

3. To an employer the answer to the question “will is man be likely to give continuous effective service r an indefinite period?” is valuable, since reliable nployees are more useful than unreliable employees. nd at a medical examination a doctor may sometimes able to conclude with confidence that a person has undue liability to illness, or a shortened expectation life. But if to refuse a man a job because he may rm himself is an infringement of liberty, to refuse him ecause he may, through no fault of his own, prove reliable seems a shocking injustice. The victims of vere asthma, tuberculosis, peptic ulcer, rheumatoid thritis, and other recurrent or progressive diseases ve misfortunes enough. If in addition no-one will nploy them, their fate is melancholy. In recent years ey have been the subject of sympathetic legislation, r a law has been made compelling employers to accept proportion of disabled men. As regards the National ealth Service, whereas originally the newly appointed d to be certified as free of physical defect or disease hich appeared likely to prevent continuous effective rvice *in the future*, the doctor is now only asked give his opinion on the candidate’s present ndition.

4. When the candidate for a job is a potential danger his fellow workers and others, there may be the rongest reasons against appointing him, however rd his fate may in consequence seem. But there seem be only two common conditions—pulmonary tuber- losis and epilepsy—whose victims are liable to objection this account. And only in a few occupations, such driving a vehicle, is the epileptic dangerous to other eople. Undoubtedly there are a number of conditions, cluding such skin diseases as widespread psoriasis, hich are so frightening or unpleasant that their subjects re apt to be treated almost as lepers. Yet to refuse man a job because he has one of these conditions ould be as bad an injustice as to refuse him because has an undue liability to fall sick. In so far as a octor is concerned in this sort of situation, his efforts hould be directed to removing the prejudices of those ho object to the near presence of unfortunate people ith skin diseases and other unsightly or unpleasant isorders.

We may therefore conclude that there is no real place r a medical examination as a part of the selection of adults for jobs. To assess a man’s capabilities is not a medical problem; to refuse him work because he may damage himself is nearly always an unwarranted interference with his personal liberty; to refuse him because he may be unreliable through bodily disease is unjust; and, with the exception of two conditions, it is highly unlikely that he will be a danger to others, whatever diseases he happens to have. And perhaps the most important disorder which should legitimately influence the work which a man is *allowed* to do—namely, epilepsy—cannot be discovered by objective examination: in its detection a certificate from *a candidate for a job* that he is free of it is all that is needed. For juveniles a medical examination before acceptance for work is conceivably justifiable, though even in their case there is very rarely convincing evidence that doing a job of which they are capable will in any way harm them.

6. Summary and Conclusions

1. In the diagnosis of malaria and amœbiasis too great an emphasis was put upon the microscopical aspects of the problem, by comparison with the clinical, during the Burma campaign.

This practice provides an example of the common modern error of exaggerating the importance of special investigations by comparison with clinical findings, and particularly with symptoms.

2. Soldiers were admitted to hospital too often with malaria: they were retained there too long with amœbiasis and other acute diseases: and they were wrongly admitted for investigation and disposal.

Civilians are also sometimes retained in hospital too long, and are wrongly admitted for investigation and the medical treatment of certain chronic conditions.

3. The method of medically classifying soldiers during the late war, and to a less extent the present PULHEEMS system, are wrong because they depend on structure or on the function of single parts or organs of the body. Soldiers should be classified according to their ability to function as such.

The medical classification of civilians for jobs is unnecessary, often unjust, and sometimes interferes with the liberties of the subject.

I wish to thank my father for his valuable help in revising this paper, and Dr. Frank H. Scadding for his advice and criticism.

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“. . . Reverting to the tropic hormones of the anterior pituitary, it should be noted that these are by no means the only examples. There seems to be a fairly general and adaptable mechanism whereby the appearance of a protein stimulates the formation or release of various steroid hormones at different sites in the body. There must be some common factor in these processes, and it may not be so far from our reach as we imagine. There is a widespread belief that steroid hormones are intimately connected in some way with malignancy, and for this reason alone research in this field must be vigorously pursued.”—Sir ROBERT ROBINSON, P.R.S., *Nature, Lond.* Dec. 17, p. 1023.

hospitals, and the shortage of nurses causing many beds to be kept empty, the title of this section may appear strange. And, doubtless, there is nothing in civil life corresponding to the abuse of hospitalisation in the Army which I have been describing. For many of the disorders which hospitalised the soldier—e.g., gonorrhœa, malaria, tonsillitis, and bacillary dysentery—the average civilian would never dream of going into hospital. Nor are patients admitted to civilian hospitals for purposes of disposal.

In some respects, nevertheless, the abuse of hospitalisation in the Army has its counterparts in civil life. Perhaps the best example of this is the practice of admitting patients with chronic complaints for investigation, which is often futile or harmful for reasons similar to those given in the third part of this paper. Many people with chronic or recurrent treatable complaints—e.g., diabetes, pernicious anæmia, and peptic ulcer—are also, in my opinion, wrongly admitted for treatment. Admittedly, it is commonly held that those with peptic ulcer should go to hospital in their "early, curable stages" so that they can be treated vigorously and the development of the serious phases of the disease prevented. But there is apparently no sound evidence behind this argument, while a study of the natural history of the disease suggests strongly that it is false: it is very hard to understand how even the most intensive treatment now should prevent the recurrence of an ulcer in a year or two's time. Again, among the patients who really need hospital care many seem to be retained too long. In surgical wards they may be unnecessarily admitted several days before their operations—perhaps for investigations which could have been performed when they were outpatients—and unnecessarily retained for some weeks afterwards. In medical wards, convalescents from acute illnesses are sometimes not discharged, though they seem quite well and their home conditions are excellent, because of a vague fear that something may go wrong. In teaching hospitals the additional reason that a patient is a "good teaching case"—i.e., has numerous exciting physical signs—may delay his discharge.

It seems, therefore, doubtful whether the genuine shortage of ordinary "short-stay" beds in this country now is as great as it appears. If the only patients who were admitted to such beds were those who might reasonably be expected to *benefit from being there,* and if they were discharged as soon as they had ceased so to benefit, there might be room in hospital for many acutely ill people who are now looked after to their disadvantage in their own homes, and the swollen surgical waiting-lists might soon disappear. As regards the beds used as permanent homes for the chronic sick, who cannot otherwise be looked after, the position is of course very different. There is, and doubtless will continue to be, a shortage of such beds, because few nurses are willing to look after their typical occupants—old people with senile dementia, incontinent of both fæces and urine, and commonly with the sequelæ of a stroke or strokes.

MEDICAL CLASSIFICATION IN CIVIL LIFE

I said in the fourth part of this paper that, in contrast to Army practice, men in civil life are employed or dismissed because of their ability or inability to do their work, not on the strength of a medical examination. But this statement is not now altogether true, for in recent years an increasing proportion of men have had to go through some sort of medical examination to determine their "fitness" for their desired occupation. In one particular field—the employment of juveniles in factories—such examination started more than a hundred years ago. Under the Factory Act of 1844 certifying surgeons were appointed who were empowered to examine children and issue the following form certificate: "I certify that I have today examined person . . . and am satisfied that such person is of age . . . and is not incapacitated by disease or bod infirmity from working daily in these works for the ti allowed by law for a young person." In 1937 certifying factory surgeon changed his name to that examining surgeon. As such he had the power reject a youngster as unfit for work. Quite apart fr this legal insistence on a medical examination for juveni many large firms and public bodies have their o private rules on the matter. Hospitals, for example, ha for years required that all their potential nurses shou be passed as medically "fit" before being accept Today each person appointed to the National Heal Service must be certified by the examining doctor "free from any physical defect or disease which n impairs his capacity satisfactorily to undertake t duties of the post for which he is a candidate."

When a man is medically examined before bei accepted for some kind of work, an answer may required to each of the four following questions:

1. Is he capable of doing the work?
2. Is it advisable, for his health's sake, that he should do t work?
3. Will he be likely to give continuous effective servi in the work for an indefinite period in the future?
4. Will he be a danger to others?

These questions will now be considered in turn.

1. I concluded in my fourth section that the asses ment of a man's present capabilities as a soldier is not medical matter at all. This is even more true of civ life. The way to decide whether a man can efficiently he coal, lay bricks, write leading articles, or direct a compan is either to study his previous record in these direction or to give him an appropriate examination. Yet th form of medical certificate laid down for candidate to posts in the National Health Service (given above requires only a statement about his capacity. If candidate for a clerkship has been selected by an appoint ments board because his testimonials provide clea evidence that he is in fact efficient in clerical work the doctor cannot say that he is incapable of it.

2. I also concluded that if a soldier is continuously capable of certain duties there is rarely any good reason why he should not perform them. A similar conclusion can be reached about work in civil life. Admittedly this conclusion would not be universally accepted in medical circles: many doctors adv [illegible] who have had a coronary thrombosis, or have [illegible] or a liability to peptic ulcer, not to perform heavy manual work, though they can do so without distress. But, whether they are right or wrong in this, it is clear that the function of the doctor who is examining candidates for a particular job is not to *advise* them as to the kind of occupation they should undertake, but *to accept* or *reject* them. Even if it is true that a person would be ill-advised to take some particular work, it may not be justifiable to forbid him to do it, when he is quite aware of the risk he runs. This is one example of the general question as to how far society is justified in compelling individuals to refrain from actions which harm no-one but themselves.

Now, it appears to be the common opinion in this country—and it is an opinion with which I concur—that men should in general be free to do what they like, provided that they do no direct damage to anyone else. And as a rule the Law supports public opinion in this matter, making no attempt to prevent people from, say, drinking excessive amounts of alcohol, climbing precipices, engaging in motor races, or going on expeditions to the South Pole.

hising to some extent with this objection, the points out that "the National Insurance Certification) Regulations, 1948 (S.I. 1948, 1175), provide, in paragraph 3 of the Schedule, that in the practitioner's opinion, a disclosure to the t of the precise cause of incapacity would be udicial to his well-being, the certificate may contain s precise statement."

PARA-AMINOSALICYLIC ACID AND STREPTOMYCIN IN PULMONARY TUBERCULOSIS

CLINICAL trial of *p*-aminosalicylic acid (P.A.S.) and ptomycin in pulmonary tuberculosis was undertaken 1948 by the Medical Research Council, with the eration of the British Tuberculosis Association. The l is not yet completed but some of the results already ined are so important that the joint committee onsible for guiding the trial has decided to issue the wing preliminary statement.

major disadvantage of streptomycin is that the od of effective therapy is limited in many patients the emergence of streptomycin-resistant strains of rcle bacilli after five or more weeks of treatment. y workers have suggested that the addition of her tuberculostatic agent might suppress the resistant strains, which in the initial phases are present in small numbers: published reports on a few cases ted with P.A.S. and streptomycin have been encourag- The present investigation was planned to examine, he method of controlled trial, the possibility that . has this property, and at the same time to assess clinical effect of this drug alone and in combination streptomycin.

PLAN OF TRIAL

hree treatment groups of over 50 cases each were rved: (*a*) P.A.S. alone (20 g. of the sodium salt); (*b*) streptomycin alone (1 g. daily); and (*c*) both s together (20 g. of the sodium salt of P.A.S. and of streptomycin daily). The methods were similar hose employed in the first M.R.C. clinical trial of ptomycin in pulmonary tuberculosis,[1] and the type ase was again defined as follows: acute rapidly ressive bilateral pulmonary tuberculosis, of recent elopment, unsuitable for collapse therapy, in young ts aged 15–30. After acceptance for the trial by a l, patients were allocated to one or other of the e treatment groups by a method of random selection. prescribed treatment was given for three months ach group. Clinicians and pathologists at eleven ital centres have coöperated in this investigation, ing uniform records, using standard clinical and eriological procedures, and reporting results at regular vals to the council's Tuberculosis Research Unit, re the grouped results have been analysed.

PRELIMINARY RESULTS

r this well-defined type of case of pulmonary rculosis, the trial has demonstrated unequivocally the combination of P.A.S. with streptomycin conably reduces the risk of development of streptoin-resistant strains of tubercle bacilli during the onths following the start of treatment. This conon is applicable so far only to the acute form of se treated, and it remains to be seen whether the e results are obtainable in other forms of tubercuamenable to streptomycin therapy. Furthermore, conclusion is applicable only to the large dose of used; this dosage causes discomfort in some patients and it has been agreed to find out, by further trials, whether smaller doses would achieve a same result. It must be stressed also that streptomycin is effective only in certain forms of tuberculosis, and the finding reported here must not be interpreted as indicating that a combination with another drug will be effective in those forms for which little result would be expected from streptomycin alone.

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[1] 1. *Brit. med. J.* 1948, ii, 769.

THE NEW ZEALAND ELECTION

FROM OUR NEW ZEALAND CORRESPONDENT

AT this general election on Nov. 30, the National Party was returned with the substantial majority of 46 seats to Labour's 34, the latter figure including all the 4 Maori seats. The Labour government's fourteen years of office thus came to an end, and Mr. S. G. Holland has assumed office as prime minister. The new minister of social security and health is Mr. J. T. Watts, of Christchurch, a barrister and solicitor about 40 years of age with a distinguished academic record, who entered parliament six years ago.

The National Party's election policy emphasised prevention and research, and promised a complete reorganisation of the hospital system on a basis of regional control and decentralisation. It supported recent Acts for the more economical management of medical and pharmaceutical benefits, and promised help for the elderly, for the Post Graduate Women's Teaching Hospital in Auckland, and for a number of other projects. With recent and forthcoming appointments inside the health department—notably that of the new director-general, Dr. J. Cairney—the field is open for much-needed progressive development.

The Labour Party's fourteen years saw the introduction, in spite of war-time difficulties, of an almost complete series of medical and allied benefits under social security, specialist services being the only major gap. The fee-for-service principle in maternity and medical benefits was dominant. Little change in hospital organisation and planning was undertaken, though during this era the government came to be much more responsible for finance than formerly.

Public Health

Typhoid on a Liner

WHEN the liner s.s *Moollan* arrived in the Port of London on Dec. 16, three sick members of the crew were removed to hospital for observation. On subsequent days further members of the crew were admitted to hospital, and a diagnosis of typhoid fever has now been confirmed in some of them. On Dec. 22 a total of eleven confirmed cases were under treatment, and five further members of the crew were under observation in hospital. The organism is Vi-phage type A. Retrospective inquiries suggest that the dates of onset of illness were during the last ten days of the voyage. One passenger has been admitted to hospital as a suspected case of enteric fever. The names and addresses of passengers and members of the crew who left the vessel have been notified to medical officers of health of the destinations to which they were proceeding.

Poliomyelitis

In the week ended Dec. 10 notifications in England and Wales numbered: poliomyelitis 124 (141), polioencephalitis 10 (15). Figures for the previous week are shown in parentheses. The total of 134 notifications of poliomyelitis and polioencephalitis together may be compared with figures of 76 in the corresponding week of 1947 and 36 in 1948. In 1926 the corresponding

Special Articles

MEDICAL CERTIFICATES

INTER-DEPARTMENTAL COMMITTEE'S REPORT

Two years ago the Minister of Health and the Secretary of State for Scotland set up a joint committee, under the chairmanship of Mr. Archibald Safford, K.C., " to consider the medical certificates required under present enactments or regulations or for other administrative purposes," and to advise how far it would be possible to reduce the number of certificates to be signed by practitioners and to improve and simplify the forms of certificates and the rules governing their issue.

In its report,[1] issued this week, the committee asserts that the increasing demand for certificates is to the disadvantage of both doctors and patients; and the best way to reduce the number of certificates would be for the Ministry of National Insurance to provide, at the request of insured people, extracts of certificates of incapacity which could be used for more general purposes than at present—for presentation to employers, for example.

The committee points out that some certificates and forms are of great complexity, and it recommends that each department should be asked to review, with the aid of its medical advisers, the possibilities of simplification.

> " One general point can clearly be made. It is of great assistance to a person called upon to complete a document if he is familiar with its lay-out. If the same questions are asked but they are printed in a different order or in different type or on different sized paper or on different pages of the form in question, the identity in content of the two documents will escape the observation of the person dealing with them until he has studied them with care. A doctor familiar with one form, called upon to sign the other, may approach it as an unfamiliar matter which requires preliminary and wasted study. Even if a few additional questions need to be asked in one of the documents they may be so placed as to form a separate and easily recognisable group."

Further general suggestions are that: (1) it is convenient to leave the place for the date immediately under the doctor's signature; (2) it is unnecessary to make the doctor write in the name and address of the patient if this appears elsewhere on the form; and (3) a general inquiry about disease should call for the enumeration of symptoms or signs rather than ask whether the patient is free from disease. " In the future in preparing new forms of certificates it would seem to be desirable that advice and assistance should be obtained from some joint committee representative of medical and other interests with legal guidance available to them."

The committee abstains from drastic recommendations since it believes that without knowledge of the day-to-day working of a control it is usually impossible to say whether a particular question can be eliminated. Instead, it lists the many certificates and other forms that the doctor may be called on to sign, so that those requiring them may be able to consult and avoid duplication, and where possible adopt the same or similar forms.

The report suggests that

> " the doctor's function in relation to the signing of certificates is to provide evidence of medical facts or inferences and does not extend to a general assurance that the application or other matter in respect of which such a certificate is used is founded on a true presentation of the other facts of the case. Instances of the inclusion of such non-medical matters in the forms at present in use may often be found."

Furthermore, the doctor should not be called on to state as a medical fact something of which he has no personal knowledge.

The committee recommends that section 33 (2) (*d*) of the National Health Service Act, 1946, and section 34 (2) (*d*) of the National Health Service (Scotland) Act, 1947, should be amended to provide for the free issue only of " such certificates as may be prescribed, being certificates reasonably required under or for the purposes of any enactment."

SPECIFIC RECOMMENDATIONS AND CONCLUSIONS

Admiralty.—The committee suggests a variation of layout in the forms of attestation.

Ministry of Agriculture and Fisheries.—Local agricultural wages committees should be encouraged to assess percentage disability by personal observation.

Commonwealth Relations Office, Division B.—A normal certificate of cause of death is all that need be produced with form 178 (Military Dept.).

Ministry of Education.—This department should reduce the demand for certificates where a child is absent from school to cases where the allegation that the child is ill is believed to be false, or where the situation is one which a layman cannot judge.

Ministry of Food.—(*a*) The length of validity of a certificate of the need for special rations for active workers should be at the doctor's discretion, and not restricted to one week; (*b*) form R.G.50A puts an unwarrantable burden on doctors (this form, which has to be completed to enable patients with active polyarthritis to obtain extra milk, includes the question: What is the value of the sedimentation-rate?).

Ministry of Health.—(*a*) The demand for a certificate for an ambulance is unjustified, except in special circumstances; (*b*) the provision of a certificate to obtain a district nurse or home help is not convenient or necessary; (*c*) one certificate should suffice for all purposes to obtain a specially made surgical corset.

Home Office.—(*a*) Form Port 12 should be revised so that the duplicates may be made by carbons; (*b*) the forms used by fire authorities should be coördinated.

Ministry of Labour.—(*a*) Modification of form DP32 is suggested; (*b*) wages boards and wages councils should be encouraged to assess percentage disability by personal observation; (*c*) the certificate of probable absence of a trainee should be dropped.

Ministry of Pensions.—Instead of MPC21, a form similar to form BW2 of the Ministry of National Insurance might be used.

Ministry of National Insurance.—(*a*) The books of medical certificates should be provided with counterfoils, and they should be distinguished by different colours; (*b*) there should be longer intervals between certificates in the case of long-term and permanent incapacity; (*c*) existing arrangements for the provision of extracts of certificates (which are already to be supplied for the purposes of a friendly society or trade union from which the insured person is claiming benefit on the ground of incapacity) should be extended to more general purposes.

Ministry of Transport.—Slight alteration of form PSV15A is proposed.

Scottish Education Department.—(*a*) The form of examination for candidates to train as youth leaders is unnecessarily elaborate; (*b*) Form 189 is unnecessary with the use of form 9T.

Scottish Home Department.—The committee does not consider a certificate " on soul and conscience " to be a certificate in the sense in which it is used in the National Health Service Acts.

OTHER OBSERVATIONS

In its evidence the British Medical Association proposed two standard forms of certificate which, it was contended, would be suitable for most purposes. One form was for National Insurance use, while the other was drafted to cover all cases where the patient needs medical evidence in order to attain some necessary object. The association proposed that the condition of the patient should not be stated specifically but should be classified according to categories known to the doctor but not to the lay person who would normally handle the certificate; concern was expressed at the increasing divulgence of diagnosis as the result of universal certification. While dier RAYNER: Will the Minister do something about Does he realise that in many of these small cottage 's, offering very few amenities, they have to charge than the London Clinic; that a great many old people to have extra privacy and are quite able to pay reason- or it, but cannot pay fantastic prices; and does he that doctors, nurses, and patients are absolutely fed the whole business as regards private rooms? AN: The hon. Member has entirely exaggerated the The fact is that so long as there is need for hospital dation it is not desirable to relax the situation so ple can buy their way into hospitals before those who hem more. Brigadier RAYNER: In view of the bank- ature of the hospital service, can the Minister afford the revenue from these private rooms? Mr. BEVAN: ospital service is no more bankrupt than the resources nation.

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[1] Ministry of Health and Department of Health for Scotland. Report of the Inter-Departmental Committee on Medical Certificates. H.M. Stationery Office. Pp. 102. 2s.

WILSON HARRIS: Does not the Act already provide ny patient needing a private room for medical reasons it over the head of anybody else, and is it not rather ate position as a result of this Act that these very prices should be charged? Mr. BEVAN: The hon. confuses the situation. There are two types of dation in hospitals for which a charge is made. There amenity bed for which one only has to pay for the and there is the other where one has to pay for the n and the medical service if one insists upon having s of a particular kind. In most hospitals it is now to have both. In this hospital to which reference is if the beds are empty, they are made available to who need them urgently. Brigadier RAYNER: Who to buy them at 19 guineas a time in a small cottage al? Mr. BEVAN: The answer is that if they cannot em at that price they can have them free if they need urgently.

A General-practitioner Hospital

G. W. ODEY asked the Minister why it had been decided e Beverley Cottage Hospital should cease to be a general- ner hospital as from Jan. 1 next; and why this had been taken without any consultation with the management committee, the members of the public ley and district, or the local medical profession, in ention of the advice given to regional boards in his 's circular R.H.B. 49 (132).—Mr. BEVAN replied: d that the board took their decision before my was issued, but that they have now asked the manage- mmittee to consider the practitioners' representations. bject is to make full use of beds, staff, and facilities, have not been fully used up to now.

Hearing-aids

GERALD WILLIAMS asked the Minister if he had dis- d the percentage of persons who could not be fitted the "Medresco" hearing-aid; and if he proposed to distributing centres of aids to the hard-of-hearing y other hearing-aids until the new medresco was —Mr. BEVAN replied: I am advised that the per- likely to benefit from a different electrical aid is less . The answer to the second part of the question is r. WILLIAMS: Will the Minister bear in mind that hen the medresco hearing-aid is available in quantity not suit everybody, and will he therefore give the of other hearing-aids a chance of letting the public heirs?—Mr. BEVAN: At the moment we are investigat- possibility of having an aid which will be suitable for than 5% of the hard-of-hearing, and when that aid able it will be distributed freely like the medresco I hope to be able to make an announcement before

W. S. SHEPHERD: Are those unfortunate 5% to wait any relief because of the obstinacy of the Minister?— EVAN: No, but I am not prepared to mulct the ers to provide commercial aids.

Treatment of Sex Offenders

JOHN CORLETT asked the Home Secretary to what it was the practice in prisons for prison medical officers ing men sentenced to imprisonment for sex offences drugs which destroyed the sexual urge.—Mr. CHUTER plied: No such drugs are being administered by prison al officers.

In England Now

A Running Commentary by Peripatetic Correspondents

CHRISTMAS AT THE E.B.S.

Doctor Wenceslas rang up,
On the Feast of Stephen,
Just before he sat to sup,
Latish in the even:
Wildly shrilled the bell that night,
Witness to his fury,
Telephoning in his plight
Number Ten, Old Jewry.

"Listen, girl, I want a bed,
And I want it quickly,
Mrs. Binks is nearly dead—
Or at least is sickly."
"Sir, I pray you, what is wrong?
Has she tertian fever?
Soon, I hope, we'll send along
Someone to retrieve her."

"Hackney, can you take her in?
Or can you, St. George's?"
But the staff were sufferin'
From their Christmas orgies:
So the maidens, one and all,
Dialled London madly,
Telling every hospital,
Mrs. Binks was badly.

"Sir, there's nobody about,
I have tried each number,
Porters to a man are out,
Housemen wrapped in slumber."
"Girl, I will not take excuse,
Mrs. Binks is worser:
Ring until the wires fuse,
Or yourself shall nurse her."

Far their clarion call they sent,
Sleepers to awaken:
By the last establishment
Mrs. Binks was taken.
Therefore, maidens, all accurst
By G.P.s be reckoned,
If you ring the ninety-first
But not the ninety-second.

* * *

Each year we try to do something distinctive at our Christmas party, to mark it off from other parties at other times. This year we demanded that our guests should wear evening dress: the men grumbled but the women loved it. In our household there was distressing talk of my missus getting a new evening gown until I persuaded her that her 12-year-old one was the best of all. She sewed some lace round the edges, and on the evening I actually believed what I'd said. We limited the number to twenty-five, and included a fair sprinkling of foreigners—Swedish, Danish, French, Russian, and ex-German—chiefly because we like them but also because they know that a party is the place for chatter and laughter, however indiscriminate. The drink question I solved empirically half an hour before the guests began to arrive at 8. I found that one part of rum, two parts each of gin, dry vermouth, and orangeade, and four parts of dry cider made an innocent-tasting mixture. (Those who find it too dry can sweeten it with sugar or—here's a tip—with just a touch of glycerin.) Working out this problem cheered me up enough to greet the first guest with suitable warmth.

For an hour we left them sipping in peace—with relief I noted the hum of talk rise from basso pianissimo to alto con esprito—and then we started them on the first game. In my view games are all right if they are few and short and make no demands on the mind. This year we chose the game in which one pins the name of a different hero or heroine, dead or alive, on the back of each guest and makes them guess their identities: they can ask each other guest not more than three questions, and the answers must be Yes or No. Then, after a pause, we went on to the drawing game. The party is divided into teams of six or so;

figure was 43 and in 1938 it was 30. Multiple cases were reported from the following counties:

London 15 (16), Bedford 2 (0), Buckingham 3 (2), Cambridge 3 (1), Chester 4 (2), Cumberland 3 (0), Devon 2 (0), Dorset 4 (1), Essex 10 (7), Gloucester 2 (7), Hertford 3 (2), Kent 8 (10), Lancaster 9 (14), Middlesex 6 (15), Norfolk 4 (4), Northampton 2 (1), Nottingham 3 (6), Southampton 2 (5), Stafford 3 (5), Surrey 6 (6), Sussex, East 5 (4), Warwick 5 (6), Yorks, East Riding 2 (0), Yorks, West Riding, 13 (19), Glamorgan 4 (6).

New Regulations.—The Public Health (Acute Poliomyelitis, Acute Encephalitis, and Meningococcal Infection) Regulations, 1949 (S.I. 1949, no. 2259), will replace, with slight modification, existing regulations on the notification of these infections. Under the new regulations, which come into force on Jan. 1, "acute polioencephalitis" will be included under "acute poliomyelitis," which will be notifiable as "paralytic" or "non-paralytic." Acute encephalitis will be notifiable as either "infective" or "post-infectious following. . . ."

Parliament

Nutrition Policy

IN opening a debate on nutrition on Dec. 15, Mrs. C. S. GANLEY reminded the House of Commons that in 1936 4½ million people spent only 4s. a week on food; 9 million spent only 6s.; and a further 9 million only 8s. Lord Boyd-Orr had declared the first of these diets to be inadequate; the second to lack proteins and fats; and the third to provide insufficient vitamins and minerals. Today, Mrs. Ganley continued, 336·7 lb. of liquid milk was consumed per head per year compared with 216·9 lb. before the war, and though the consumption of butter was now 12·5 lb. compared with 24·8 lb. before the war, there was little difference between the pre-war and present-day total consumption of fats. With their priority allowances for their children and themselves British mothers were better cared for, and their children were better born, than ever before in our history. Mrs. Ganley quoted Professor Bonnet, a leading French specialist, who when inspecting English school-children in 1948, said that in ten years England would have a generation of young men and women superior physically and mentally to that of any other European country.

Mr. SOMERVILLE HASTINGS pointed out that there was a world shortage of food and every country was affected by it. The less highly developed countries were now claiming their right to share in the world's supplies. By rationing we had provided to some extent fair shares for all, and by food subsidies we had ensured that the important foods were within the reach of even the poorest section of the community. About a fifth of the people were now getting less food than before the war, and about two-fifths were about the same, but the remaining two-fifths were now receiving much more food. As a result the health of our people had, on the whole, been extraordinarily well maintained. He was not forgetful that at present there was a very high incidence of tuberculosis, but this was probably due to the fact that the disease was much more often recognised than it was before the war. There was no clear evidence that the death-rate from tuberculosis was increasing, and the death-rate was the really *important* guide as to the nation's nutrition. On the whole the recent white-paper on Food Consumption Levels in the United Kingdom [1] was most reassuring. But he was a little unhappy about vitamins, and about fats which were some 16% below pre-war. Also he wished we ate more fresh fruit. Though we had increased our vegetable supply by 10% compared with pre-war, we had reduced by 8% the amount of fruit we ate.

Colonel M. STODDART-SCOTT said that the pattern we had developed in this country over many years had provided a diet suitable for our climatic conditions and industrialisation. The white-paper showed certain deficiencies in that diet as well as certain additions to it. The additions in respect of calcium and iron were extraordinarily good and he hoped would so continue. But, if we were to get the most nutritious and attracti we must have more meat, more animal fats, and animal proteins.

Dr. HADEN GUEST believed that we were now at a very high standard of nutrition. The vitality of the nation were great and food-ra price control, and subsidies were all necessary to that standard.

Mr. WALTER ELLIOT thought that a more as well as a more stimulating diet was desirable. might argue this way or that way on the adequacy diet and the lassitude or vigour of those who but vital statistics must be the final test, and many of the important curves of vital statistics h down some of the significant curves remained up. figure for tuberculosis, especially in Scotland, higher than it ought to be if the only explanat our good health was good rations and equal shares It might be that equal shares were not always fair He was sure there was much heavy work done—an in the North than in the South—for which equal do not make an equal contribution to health. desire of the ordinary person for variety in his diet be acceded to if possible. If we were to cont progress we must do our utmost to see that a varied diet was available and that where moved towards the traditional big meat ration not depend so much upon the large starch ration which we were being adequately though monotonously maintained today.

Dr. EDITH SUMMERSKILL, replying to the said the white-paper was a factual document Ministry of Food did not try to prove t the moment the national diet was at its optimum. over-all position, however, had much improved. was not satisfied with the amount of meat available but we depended on other countries for most supplies and no additional meat was available. Ministry would like to distribute more fats. A survey had revealed no signs of fat deficiency country, however, and consumption of butter, m and cooking fats was at the beginning of the about 90% of the pre-war total. It had since increased to 98%. Since last July consum flour had decreased by 19%. The decrease equivalent to 60 calories a head and the extra f sumption was equivalent to 75 calories. The spectacular result of the nutritional policy in had been the almost complete elimination of At the beginning of the century a third of the children had rickets. They either had bandy knock-knees, or pigeon chests. Now this had gone. The Government were trying to translate t which were expounded in the past into practice bring these things right into the homes of the p They looked forward to the day when they could a balanced diet with the full complement of n which everyone desired. Despite our difficult were progressing and the hard-pressed hou could look forward to the future with confidence.

Royal Assent

In the House of Lords on Dec. 16 the Royal was given to the National Health Service (Am Bill, the Nurses (Scotland) Bill, and the Adopt Children Bill.

Parliament was prorogued till Jan. 24.

QUESTION TIME

Fees at Cottage Hospitals

Brigadier R. H. RAYNER asked the Minister of H he was aware that under his regulations the future charge for private rooms Hospital would be, without and with such attendance £26 and with such attendance, 15 guineas and Hospital, without medical attendance, £10 12*s.*; and whether he would a such attendance, a reduction in these charges.—Mr. ANEURIN BEVAN These charges have been calculated in accord the requirements of the National Health Service cover the whole cost of the accommodation and provided, and I have no power to reduce them.

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[1] See *Lancet*, Dec. 24, p. 1186.

and stool examinations are negative. The sig- opic findings described are those commonly seen of spastic or mucous colitis. The vomiting and other symptoms described—particularly the weak- distension, and discomfort—will be recognised by o have seen many cases of alimentary neurosis as very common in that condition. Improvement a course of emetine cannot be held as evidence for or against amœbiasis or neurosis since almost treatment may induce a temporary improvement in patients, and the subsequent histories in this are not discussed.

is well known that to treat patients with neurosis ugh they are suffering from an organic disease to confirm and perpetuate the neurosis,[2] and leads h needless incapacity. There can be little doubt when the diagnosis of amœbiasis is made frequently al grounds alone, large numbers of alimentary are in consequence mismanaged. The resulting invalidism and loss of working-time is almost ly greater than that incurred by a careful search stools as a prerequisite of treatment. Unfortunately actice of treating almost all alimentary disorders makes a ready appeal to some physicians tropics, who find it more lucrative and certainly exhausting to prescribe emetine than to assess lly the physical and psychological state of the t, and where necessary to persuade him or her that ic disease is present. To encourage the practice in or out of the Services is a retrograde step which long run can only harm the patient. The diagnosis sentery, carefully using all available methods, is ly satisfactory basis for treatment.

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—Dr. Todd's article of Dec. 17 constitutes a ge which cannot go unanswered. In my opinion ictures on Army medical policy during the Burma ign are too sweeping, possibly because his related only to a small sector of the vast Conditions in the Kabaw valley could not be d as typical of more important theatres elsewhere. therefore in order to redress the balance and to some of my own experiences during a stay in and Burma from 1942 to 1945. Arriving with the British General Hospital—probably the first to in India—I later saw the Arakan campaign through the rear, in Ranchi in 1943, and from the front, in rakan from January, 1944, onwards almost to the of the war.

the early days, regulations for the treatment of were essential, since British M.O.s had little idea to do and some Indian M.O.s even less. One surely not quibble therefore with the desirability of sing malaria before treating it, and it was no p to look at a slide of a patient not seriously ill at him an hour or two later. If it was negative, e was to repeat the film later in the day or on llowing morning. If still negative and malaria d on clinical grounds to be probable, I had no ion in treating the case as "clinical malaria." I yet to learn that this policy was frowned upon; contrary, I found that approval was given to any in charge of a medical division of a hospital if he put up a reasonable case. Certainly one should have had to wait for repeated rigors before treat- and if this happened in the Kabaw valley it was n of the main dressing-station and certainly not se who framed the regulations.

point, however, on which I agree that Army policy mistaken, was in the use of pamaquin. This was abandoned partly because of an outbreak of hæmoglobinuria which Dr. McMartin and I studied.[3] This took place during "blanket treatment" (not mentioned by Dr. Todd). Our paper described 13 cases and adduced experimental evidence that pamaquin, and not blackwater fever, was the cause. In addition "formes frustes" were discovered, while in one unit 36 out of 200 men suffered from various forms of pamaquin toxicity. Of 3000 patients studied over a two-month period at the same time, 10% suffered from symptoms which had hitherto been attributed to malarial debility.

It is true that in 1943 malarial cases were evacuated very long distances, but that was presumably the reason why my hospital, of whose medical division I was in charge, was moved down from Ranchi (Bihar) to a position in the Arakan, cheek-by-jowl with 14 Indian Divisional headquarters, well to the south of Cox's Bazaar where other hospitals were based. This was in January, 1944, and during that year 50,000 patients were admitted, of whom over half had malaria. We retained the majority of these malarial cases for the full course of treatment, which had already been started at the main dressing-station, field ambulance, or casualty-clearing station. Most—in fact the great majority—were returned direct to their units, while others were sent to the rest-camp or to one of the hospitals at Cox's Bazaar. In this way the flow of cases to the rear was stemmed, at least as far as the Arakan was concerned, although the work involved was extremely arduous.

Along with these malarial patients, we had thousands with dysentery, but amœbiasis was less often diagnosed by the medical units in front of us. "Clinical dysentery" was common and many had already been treated as cases of bacillary dysentery, often quite correctly. Our routine was to send a stool to the laboratory the morning after admission. In all cases with a negative result, both proctoscopy and sigmoidoscopy were undertaken and swabs examined on the spot. Five hundred such examinations were made, mostly by myself, and those patients who presented the typical appearances, even if the swabs were negative, were at once started on emetine. The course was continued at hospitals in our rear. There remained a residue of some 20% who had the symptoms of amœbiasis and yet in whom sigmoidoscopy and the first two stool examinations were negative. These patients were kept for a week, and as a result of further daily stool examinations many were found to be suffering from amœbiasis: the remainder were evacuated. (Within two months, 14 cases of coccidiosis, which Dr. Todd would probably have called amœbic dysentery on the symptomatology, were discovered in this hospital.) We had no reason to question the ALFSEA 1944 instructions. If these had been ignored and Dr. Todd had had his way, bacillary dysentery would have been treated with emetine, which no-one will dispute is a toxic drug. I saw what could happen to cases inadequately treated when, as medical specialist to 14 British General Hospital, I had virtually only emetine with which to treat my cases in 1942; two out of three cases relapsed.

In conclusion, I would put forward a plea that due regard should be paid: (1) to the enormous supply difficulties that the Army medical authorities had to face, which were the only reason for postponing the use of prophylactic mepacrine; and (2) to the scarcity of medical man-power, which led to the use of many medical officers of poor mental calibre. A useful purpose will have been served by Dr. Todd's provocative article if this whole matter could be placed in its proper perspective by contributions from others who served in the Indo-Burma theatre of war.

London, W.1.　S. B. DIMSON.

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[2] Ryle, J. A. *Ibid*, 1939, ii, 353.

[3] Dimson, S. B., McMartin, R. B. *Quart. J. Med.* 1946, 15, 25.

each team then sends one of its members out of the room; there he is given the name of an object (a brussels sprout, a ball of wool, Buckingham Palace, Mr. C., or the like) which he must draw before his team on his return; when the team has guessed the object it sends out another representative, and so on; the first team to guess all the objects wins the bag of nuts. Finally, instead of charades, we played that silly game where the party is split into halves, and one half gives a member of the other half the name of a book or play which he must act dumbly until it has been identified by his side.

Thus to supper; and here candlelight is kinder not only to faces but to the provender (though I must say my old Dutch did a jolly good aspic jelly). After eating their fill people are apt to sit around ghoulishly staring at each other, wondering whatever brought them into such a place and company; this ebb I averted with wine, red or white (no names offered or asked). Then we rolled up the carpet, had one mandatory Paul Jones, and left everybody to do what they pleased for a change. About midnight half the party crept away—to make a long journey home, to awaken a drunken sitter-in, or merely to go to bed. The dozen who were left gathered round the fire (straight gin or whisky now) and talked till two-ish. We had *two surprises: (1) that the head*-mistress of our children's school was the life and soul of the party; and (2) that our doctor—an inveterate party man—refused to play games. "I'm the umpire," he growled when I tried to bully him; so I left him skulking in a corner. Perhaps we should have chosen simpler games.

* * *

Our secretary was good; it was one of the things on which the clinic were agreed, and we often used to say so. We even enlarged on her attributes and told the houseman she would make him an excellent wife. Whether or not we influenced him we cannot say, but he took our advice and married her.

It was during their engagement that we started to be apprehensive of our fate and wonder about her successor. Hitherto we had never been called on to spell dysdiadochokinesis or even exophthalmic ophthalmoplegia, and it did not matter if we mumbled or lit our pipes while dictating, we were always presented with our ideas of the case translated into perfect English. When she left we were not kept long in doubt, for our letters acquired a new and unaccustomed flippancy. One patient was admitted "because he vomited blood and his emotions were jet black"; another "complained of irritation from a virginal discharge"; and a third had "loss of weight in one eye." Perhaps it was comment on this last case which caused: "the sight of this man's primary growth was thought to be abominable."

Alas, our present houseman is not amenable to suggestion.

* * *

The new house-physician was the first woman resident the hospital had had. I asked her where her quarters were, and she told me next door to the matron—a little inconvenient since it was far removed from the residents' common-room, &c. But she said she was lucky to be in the hospital at all, for the superintendent was a great stickler for the proprieties and had gone into the question of her previous accommodation at other hospitals pretty thoroughly—so thoroughly that she hadn't dared say that at the last one she had shared the residents' flat with two men.

* * *

. . . As others see us. Here is what the *Boston Evening American* (Nov. 18) has to say:

> "In England, under the system of Socialized Medicine which has prevailed in the country for a year and a half, the doctors are not known officially by their name but by numbers, somewhat in the manner that inmates of a penal institution are designated. The official numbers by which they are registered and under which they function professionally are assigned to the individual doctors by Mr. Aneurin Bevan, the Minister of Health. Some 18,000 of the country's 20,000 doctors are thus designated, theoretically by their voluntary consent but in many cases under pressure and intimidation inseparable from any form of the totalitarian system."

Letters to the Editor

ARMY MEDICINE IN THE LATE WAR

SIR,—In his article of Dec. 17, Dr. Todd app confuse the curative action of mepacrine with its p lactic value. Though prophylactic mepacrine was on a small scale in Southern Europe and in North I before 1939, its value and the necessary dosage only established by the work carried out at Cairns in the war. Supplies of mepacrine ('Atebrin') came Germany, and some time elapsed before adequate sup could be manufactured in England.

Clinical diagnosis must have been easy for him his cases showed fever every second or third day, why he should have waited this time to make a dia I do not understand. A blood-slide would have inva given him a diagnosis within thirty minutes of se the case if his staining technique was correct. In experience treatment was never delayed for a labora diagnosis. I know of no disease in which a labora diagnosis can be made more easily or quickly t malaria. The trouble in the Army was due to the of adequate provision for laboratory diagnosis; I agree that in a forward area there is no occasio insist on laboratory diagnosis.

Dr. Todd attributes deaths from malaria to delay treatment. I know of many deaths where imme treatment was given, and I know of no treat which will prevent a certain mortality with malign tertian (M.T.) infections—that is, excluding personne adequate suppressive mepacrine.

His account of the ease with which civilians d with malaria is ludicrous. I have known of deaths f M.T. infections among European civilians, and of bl water fever associated with quinine prophylaxis.

B. DE BURCA
Late O.C. Central Military Malaria Laborato
and Senior Instructor in Malariology,
Army Medical College, India.
Thornton Heath.

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SIR,—Dr. Todd (Dec. 17) brings forward many vi which will be recognised as sound by physicians have served in the Forces in India and Burma. Som his views concerning the treatment of amœbiasis, h ever, are open to criticism. He rightly quotes amœbiasis was "the most important single caus protracted illness and invaliding" from the Bu theatre.[1] He does not mention that neurosis was an important cause of invaliding and that alimen neuroses are frequently confused with amœbic dysent

To treat patients such as he describes as cases of am dysentery before examining their stools undoubt causes large numbers of alimentary neurotics to treated for dysentery. This in turn leads them to belief that their symptoms are of organic origin an all the subsequent trouble arising from that belief. the series of which he made a special study, repe stool examinations failed to reveal vegetative form cysts of *Entamœba histolytica*.

> "Their histories were strikingly similar. . . . All plained of anorexia and abdominal discomfort, pain distension, particularly after eating. Ten (42%) stated they had had much vomiting. All had had a certain am of diarrhœa, often in spells alternating with constipa though this was not the main complaint. Thirteen (5 stated that they had sometimes passed blood in the st All complained of weakness and some loss of weight."

If, as Dr. Todd recommends, such cases are to be nosed on clinical grounds, these symptoms surely w suggest an alimentary neurosis rather than am dysentery. Vomiting does not occur in amœbic b infections of such mildness that sigmoidoscopy show

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[1] Marriott, H. L. *Lancet* 1945, i, 679.

PEPTIC ULCER

SIR,—Dr. Martin and Dr. Lewis are to be congratulated on their very useful survey (Dec. 17) of peptic-ulcer cases followed up after ten years. Their achievement of such a low lapse-rate as 8·2% requires us to view their data and conclusions with considerable respect. At the same time their sample of cases is not at all representative of the ulcer population in general. In any given area, and in such a short space of time as four years, only a fraction of the ulcer population would be admitted to hospital for treatment. That fraction depends chiefly on the hospital facilities in the area and the age-distribution of the population, but is probably rarely more than 20%. If 20% were selected at random from the ulcer population, all would be well with your contributors' conclusions; but, as they themselves state, it is the severe and the complicated ulcer cases which are most frequently admitted to hospital. Consequently the authors' statistics, though most valuable in themselves, refer only to this selected sample containing a large proportion of severe, intractable, and complicated cases, of which we do not even know the age-distribution.

Regarded in this light, their figures for the incidence of hæmorrhage, perforation, and death among patients medically treated are seen to be unduly gloomy, whereas their conclusion that the longer the ulcer history the less likely is the ulcer to heal under medical treatment, though weakened by their lack of scrutiny of the milder cases, is probably sound.

There is one other matter which might cause confusion. The article speaks of regimen and treatment in the same sense. This, I think, is wrong. The essential feature of medical treatment of peptic ulceration is rest in bed; the essential feature of an "ulcer regimen" is the achievement of a way of life which minimises ulcer distress. Such a regimen is usually initiated by medical advice but developed by the patient out of his own experience; it rarely bears a close relation to the schedules drawn up by doctors. Surely, then, the only conclusion with regard to the effectiveness of medical treatment which can be drawn from the figures is that within the select sample studied a variety of "ulcer regimens" had no affect on the natural course of the disease. The question whether early and effective medical treatment can effect the prognosis remains unanswered, since the authors have not analysed their data in this respect. For example, their finding that short-history cases do better than long-history cases may mean that hospital admission and treatment by rest, early in the course of the disease, has a beneficial effect in the long run.

It is hoped that the advice of Dr. Martin and Dr. Lewis will not lead to an orgy of gastrectomies in patients with fairly mild and infrequent symptoms. Such cases do exist and have not really been taken into account by them in compiling their rather gruesome and depressing figures. The general rule that no patient should be allowed to suffer gastrectomy until he has already suffered considerably from peptic ulceration should still be observed. If it is not, surgeons can expect an increase in the number of patients who, after gastrectomy, complain that their last state is worse than their first.

Department of Medicine,
University of Bristol.

J. NAISH.

SIR,—It is always refreshing to find medical men, whether physicians or surgeons, publishing the bad results of their own methods of treatment. A careful ten-year follow-up of a series of peptic-ulcer patients, such as that reported by Dr. Martin and Dr. Lewis, was long overdue. Their conclusion—that medical treatment did not appear to have influenced the natural course of the disease—is all the more likely to be accepted because they *cannot* be accused of having any surgical bias.

Their figures show that chronicity in an ulcer be regarded as established until ten years from the of its onset. It is, however, difficult to accept argument that for this reason gastrectomy sho urged only when an ulcer has been present for ten They say that "it is as important not to advise g tomy for an ulcer which may still heal as it is to gastrectomy when chronicity is established." surely this is a fallacious argument. Their results that during the ten years that these patients are w for their gastrectomies 8% will die from hæmorrh perforation (tables XIII and XVI), and that of th survive the ten years 78% will still have active (table X).

The modern operation of high partial gast (removing the pyloric antrum and at least three-qu of the body of the stomach) carries a mortality-ra well under 5% in the best hands (0·5% in one series), and is followed by recurrent ulceration more than 3% of cases (nil in some series). If (as and Lewis state) the mortality-rate for the coun a whole is nearer 15%, doctors should entrust patients to those surgeons whose results are rather than deny their patients the benefits of su A proportion of patients develop post-gastrec symptoms, but in very few are these as incapaci as the symptoms of active ulceration. Of patients have undergone gastrectomy, 95% are well sa with the result, are free from pain, and are abl follow a normal occupation without dietetic restrict It is true that we have few records of ten-year follo in these patients, but the tendency up to 3½–4 y is for their condition steadily to improve.

Surely sufferers from peptic ulcer—especially t who cannot follow an ulcer régime by reason of occupation, economic status, or temperament—sh be offered the advantages of a gastrectomy as soo it is clear that their lives are being seriously distu Even in the best hands the mortality-rate for gastrec increases with the length of history, especially this exceeds five years, and with age; so by ke the patient waiting the hazards of operation are incre Many who had symptoms for much less than ten are coming to the post-gastrectomy follow-up c saying that they wish they had undergone an oper much earlier. Martin and Lewis's results confirm they would have been very well advised to do so.

Department of Surgery,
University of Liverpool.

RICHARD B. WELBOU

VASCULAR DISEASE

SIR,—The mortality from arteriosclerotic diseas been shown to change materially during the war Norway, Dedichen and Strøm[1] found a marked red in the death-rate from arteriosclerotic and c vascular diseases, starting in 1939 and stopping in Malmros[2] has recently shown a similar change i mortality from coronary thrombosis in the Scandin countries during the war; and he attributes the de to rationing, especially of fat.

Since arteriosclerosis is presumed to be a c disease, this fall in the death-rate was difficult to ex Therefore, stimulated by the theory of Winterni were anxious to know whether the same fluctuation be shown in the incidence of thrombo-embolic pheno This investigation, carried out in surgical departm of Ullevål (chief, Carl Semb) by Adelsteen-Jensen, the same fluctuation during the war as in the mo from cardiovascular diseases.

Before the results of this last investigation were to us we had started experiments with the inten

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1. Dedichen, J., Strom, A. Proceedings of the Scand Congress of Internal Medicine, 1948.
2. Malmros, H. *Nord. Med.* 1949, 46, 1785.

ıt to our notice a therapeutic procedure.)) disapproves of this, yet surely it is that as many physicians as possible the opportunity of appraising new s a failure it will be all the more quickly

A. H. DOUTHWAITE.

OSPITAL MEDICAL OFFICER

ıtion has been drawn to the advertise- e of Dec. 17, for the position of deputy ndent at Telidy. Apart from the fact scribed should obviously be undertaken it is highly regrettable that you should s advertisement and help to perpetuate r hospital medical officer.

PETER W. EDWARDS
Chairman, Tuberculosis and Diseases
of the Chest Group Committee,
British Medical Association.

Obituary

GORDON GORDON-WATSON

C.M.G., F.R.C.S., F.A.C.S.

ordon-Watson, consulting surgeon to 's Hospital, died in York on Dec. 19

Rev. H. G. Watson, vicar of St. Leonards hire. Charles Gordon-Watson himself Catholic while still a young man. He St. Mark's, Windsor, and St. Bartholo- ınd after taking the Conjoint qualifica- ıeld house-appointments at Barts and ıd Norwich Hospital. In 1899 he went :o serve as a civil surgeon in the war. ıe returned to England and in 1902 he and quickly won recognition. Besides his own hospital he also joined the staffs of the Metropolitan Hospital, St. Mark's Hospital, and St. Andrew's Hospital, Dollis Hill. He was also surgeon to the Jockey Club and the National Hunt Committee.

On his return from South Africa he had joined the 3rd Middlesex R.G.A. Volunteers and when the Territorial Army was formed in 1908 he received the rank of captain. Soon after the outbreak of war in 1914 he took charge of the Duchess of Westminster's Hospital at Le Touquet. Later, with the rank of colonel, he became consulting surgeon to the France and in Italy. For these services C.M.G. in 1915 and K.B.E. in 1919.

Charles became interested in the treat- ma of the rectum with radium, and 1 1931 he wrote a number of authorita- ıis subject. But after several years of igation, with a careful follow-up of his ed it as a regular method of treatment. his work was linked his interest in the ancer Campaign, where for many years of council and chairman of the investi-

He was also vice-chairman of the tee of Mount Vernon Hospital. Though r his versatility in general surgery—for orated with Marsh in a book on *Diseases* e wrote the article on diseases of the 's *System of Surgery*—he will be best ıaps for what he did to advance rectal 1937 he chose as the subject of his at the Royal College of Surgeons the of Cancer of the Rectum. W. B. G., C. N. M. and the staff of St. Mark's Hospital write: "In his work here certain things stand out in our memory: his kindness and thoughtfulness to patients were proverbial, but on occasion the atmosphere in the operating-theatre could become distinctly explosive! He delighted in demonstrating to foreign visitors and made them feel at home when he shouted forth a few words in their native tongue. He was a staunch, and perhaps the last, adherent of the clamp and cautery method for piles, always referring to his cautery as the 'fiery furnace.' Another feat was his extended Whitehead's operation for removal of large villous tumours of the rectum, and he would delight in removing outrageously long specimens of bowel by the perineal route. In 1935, in collaboration with Harold Dodd, he published his well-known paper on infection of the intramuscular glands, and this was, we believe, his last surgical contribution. We shall remember Sir Charles for his breezy and friendly personality; we admire him for his courage in adversity, and feel that we have lost a popular colleague, a sportsman, and a great and lovable character in British surgery."

A member of the council of the Royal College of Surgeons from 1924 to 1940, he also served a term of office as vice-president, and he was for many years treasurer of the Medical Protection Society. With Mr. Lockhart-Mummery he founded the Proctological Society which later became the proctology section of the Royal Society of Medicine. In 1931 he was elected an honorary fellow of the American College of Surgeons.

As lecturer in surgery Gordon-Watson was a popular teacher at Barts, and it was typical of his thoughtfulness for his students that his was one of the first theatres which had a viewing mirror for those who came to watch his operations. He freely admitted himself to be an "incorrigible Tory," and he was a staunch believer in the value and standard of English clinical teaching which he himself did so much to uphold. Students, he asserted, became "self-reliant because partly self-taught under capable guidance."

During the late war, from 1939 to 1942, with the rank of temporary major-general, he once more served as consulting surgeon, this time to the Army at Home. His last years were spent in York.

J. P. L.-M. adds: "Gordon was an outstanding personality. He was one of those men one could always rely on in a difficult situation to do the right thing regardless of his own personal interests. A keen sportsman, he was a good golfer and an excellent shot, and when he took up fishing he soon became quite a good salmon and trout fisherman. He and I often went for sporting holidays to Norway and Scotland. He was also a good bridge player, having been schooled in the old whist days. Whatever Gordon did he always did with all his energy and he always did it well. He was a charming friend and one of the most honest men in his opinions and deeds that I ever came across."

Lady Gordon-Watson died in 1935. Lieut.-Colonel D. M. L. Gordon-Watson, M.C., their only child, commands the 1st battalion, Irish Guards.

SELWYN GURNEY CHAMPION

M.D. EDIN., L.M. DUBL.

Dr. Champion, a world-famous student of proverbial folklore, died at his home in Framfield on Dec. 13. He was born at Burgess Hill in 1874, qualified in Edinburgh in 1897, and proceeded to the M.D. in 1902, his thesis being highly commended. A keen athlete, he played rugger for the university, and rowed in the university crew. After 32 years' general practice in Bournemouth he retired to Burgess Hill, and later moved to a delightful house in Framfield.

When still a boy, Champion became attracted to proverbs and remembered all his life that it was the saying "A rolling stone gathers no moss" that first intrigued him. He became a great collector and master of proverbs and devoted his years of leisure, up to the last day, to this fascinating study. His two outstanding works are *The Eleven Religions and their Proverbial Lore* (1942) and *Racial Proverbs* (1938). In this last monumental work, the only one of its kind, 26,000 proverbs have been gathered from every part of the world, and grouped together according to their country of origin. This collection proves, as Champion says in his intro-corresponding figures for the heart-rate were 134 and 96 per min.; this accounts for an increase in the heart-beat volume from 18 to 28 ml.—i.e., about 55·5%—which is indeed a considerable hæmodynamic effect.

With these objections, what weight can be attached to the assertion that "neither in the patients with sinus rhythm nor in those with auricular fibrillation is there any correlation between the relief of congestion and the slowing in heart-rate"; or to the sentence stating that "it is significant that atropine-induced acceleration did not lower cardiac output or increase congestion"?

London, W.1. J. PLESCH.

THE LIBRARIAN IN THE CHILDREN'S WARD

SIR,—At a conference held by the Guild of Hospital Librarians on Nov. 9, the audience was surprised to learn that at several hospitals, including large and well-known establishments, librarians were not allowed into the children's wards at all. The opposition, so far as we could gather, comes mainly from the nursing staff, and the reason given is usually "infection." It is not clear whether the librarian or her books are held to be the conveyors of disease, but in any case we respectfully take leave to doubt whether the objection is a reasonable one. If it were valid, it would surely be applicable to all children's wards, which is not found to be the case. Where the librarian is welcomed, difficulties about infection traceable to her presence or to the distribution of books do not arise in practice.

It also emerged at the conference that where the teacher acts as children's librarian, the books are sometimes locked up at the beginning of the school holidays and the children are deprived of this solace just when they need it most. A few old books left for the nurses to distribute do not in the least meet their wants.

Do these defects in the hospital library service really matter? The attention now being paid to the psychological effect of hospital admission on children has shown how bored and frightened and homesick they can be behind a mask of docility. It seems strange that the best and cheapest means of comfort, occupation, and mental stimulation—i.e., a good supply of suitable books—is still not being fully utilised.

JOHN FORSDYKE
President.
LETITIA FAIRFIELD
Chairman.
JOAN COKE
Secretary.

Guild of Hospital Librarians,
60, Beaufort Mansions,
London, S.W.3.

TREATMENT OF WOUNDED IN MALAYA

SIR,—I gather from my colleagues who served in the 1914–18 war that much of the surgical experience that was dearly bought in that war had to be gained all over again in the early years of the 1939–45 war. Those of us who served in the late war hoped that the lessons learned would not be quickly forgotten. The Royal Society of Medicine, in convening the Inter-Allied conferences on war medicine and in publishing these proceedings in book form, has done everything possible to ensure that the knowledge gained should not be lost.

It is therefore all the more regrettable to learn from a statement by the Secretary of State for War[1] on the number of surgeons in Malaya that after less than five years so much has apparently been forgotten. The campaign in the Western Desert established the value of grouping the field surgical unit and field transfusion unit at the main dressing stations of a field ambulance, with instructions to deal with "life and limb" surgery. As a result of siting these units well forward, where they could deal with such cases as penetrating wounds of the abdomen and thorax and severe compound fractures of the femur, countless
saved which would certainly have been lost
patients had had to make the journey back to a c
clearing station or general hospital. I appre
the problems of the jungle are not those of the
Desert; but those of us who went from the
Sicily and Italy, and later to Normandy, found
principles of forward surgical organisation did
very greatly in the various theatres of war.

It would appear from the War Minister's
that there are only four Army surgeons in
Singapore island; and this number would
inadequate to carry out early surgical trea
sincerely hope that in a subsequent stat
Minister will be able to assure us that the
services in Malaya are no less efficient than
Meanwhile the information he has given must
to grave misgivings.

Hove. REX B

SOMATIC EXPRESSIONS OF PSYCHIC

SIR,—In your annotation of Dec. 10, in
Harry Stalker is quoted, I was surprised to
gastric hypersecretion and motility, and
hypermotility are manifestations of an active sy
system. Surely it is generally accepted that the
control of gastric secretion comes from the
that this nerve is also responsible for all
movement apart from sphincteric activity.

Practical applications of this fact are the
atropine and vagotomy to diminish gastric

Redruth, Cornwall. J. SAN

*** Dr. Sandilands is of course quite right,
thank him for the correction.—ED. L.

FOREIGN BODIES IN THE ABDOME

SIR,—The correspondence on this subject re
of a case I saw some twenty years ago.

The patient, a man of 70, had complained
the right iliac fossa for weeks; his doctor had
"that it was not appendicitis." On examina
long thin object lying under the skin at app
McBurney's point. I removed this under local an
and it proved to be a fish-bone about 1½
Presumably this had perforated the colon and
to the surface without much local reaction
peritoneum.

Buxton. F. A.

DEOXYCORTONE ACETATE AND ASC ACID IN RHEUMATOID ARTHRI

SIR,—The lively correspondence arising fro
and Wassén's preliminary communication of
prompts me to record my experiences in respect
treatment.

In five rheumatoids the recommended dosage of
of deoxycortone intramuscularly followed by
ascorbic acid intravenously was used. There
male and four female patients. A favourable
in three females and the male was striking and im
Not only was pain relieved, but a certain
exhilaration was also noticed. The effect passed
two hours on the first day. Treatment given
resulted in a longer action—in fact up to seven ho
by the end of a week. The most striking objective
of benefit was seen in the return of ability to
fingers and form a fist. Such a degree of fle
previously been impossible over periods of six
to three years.

Whether or not this new line of approach
rise to permanent gain has yet to be determined,
is clear that the combination of drugs is by no
inert. Lewin and Wassén made no extravagant

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[1] See *Lancet*, Dec. 24, p. 1205.

duction, that proverbial wisdom is exactly the same all the world over, differing only in the rendering.

Men are known by their companions, and Dr. Champion's communion with the quintessence of human philosophy became him happily. He was a delightful friend, and truly lovable. H. P. S.

ALAN JAMES HIRD

M.B., B.SC. GLASG., M.R.C.P.

SCHOLASTIC distinction, professional skill, and charm of personality were all finely blended in the life of Alan Hird. At the early age of 16 he was dux of Glasgow Academy, and he was equally outstanding as an athlete. His wide range of interest in sport embraced rock-climbing, and it was on the treacherous slopes of Am Bodach in Inverness-shire that he missed his footing in a moonlight climb and fell to his death.

[Annan

He graduated at Glasgow University in science in 1937, proceeding to the degrees of M.B., CH.B., with honours, in 1940. It was clear that he was one of the most able graduates produced by the medical faculty of Glasgow in recent years. He was a voracious but critical reader, and his general conversation no less than his contributions to formal discussions created a lasting impression of mental poise and strength of character. At the same time he was popular among his contemporaries and seniors, for notwithstanding his notable gifts he was modest almost to a fault. Students recognised in him a physical and intellectual robustness which dispelled shyness and marked him out as a teacher of great promise; and indeed this had already been recognised by his appointment as lecturer in medicine in Professor NcNee's department.

Serving in the R.N.V.R. during the war, he sought no furtherance of his personal interests, but was more than content to be medical officer in a destroyer. Here his personal qualities and his professional competence quickly ensured his acceptance by all ranks. Soon after returning from active service he took his M.R.C.P., and threw himself wholeheartedly into clinical work in the hospitals and hæmatological research. His publications, though few, revealed an insistence on accuracy and conciseness.

Hird's untimely death will be felt immediately as a serious loss to the Glasgow school; and with the passing of the years there will often be occasion to lament that this brilliant young physician did not survive to take his place in Scottish medicine. Regret may be intensified by wondering whether the choice of a less perilous sport might not have spared him. But a vigorous and challenging attitude to life was as much a part of Hird's philosophy as were his devotedness to his patients and his loyalty to his friends.

Diary of the Week

JAN. 1 TO 7

Tuesday, 3rd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. C. E. Shattock: Tumours of the Kidney. (Erasmus Wilson demonstration.)

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5 P.M. Dr. M. S. Thomson: Animal Diseases Communicable to Man.

Thursday, 5th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. Rainsford Mowlem: Injuries of the Nose and Sinuses. (Otolaryngology lecture.)

INSTITUTE OF DERMATOLOGY
5 P.M. Dermatitis.

ROYAL P , S.W.7.
7 P.M. thods in Medical

Friday, 6th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. Shattock: Tumours of the Testicle. (Erasmus Wilson demonstration.)

MAIDA VALE HOSPITAL MEDICAL SCHOOL, W.9
5 P.M. Dr. Redvers Ironside: Neurological demonstration.

Notes and N

LONDON ASSOCIATION FOR HOSPITAL

AT a meeting of this body, held under the of Dr. W. Russell Brain, on Dec. 15, the me articles of association were amended to empo Colleges of Surgeons, Physicians, and Ob Gynæcologists, and the British Medical Associ nate its medical members. This provident sc set up by King Edward's Hospital Fund for area, is now open to anyone living in Great Northern Ireland, and it offers cover for hospital and nursing-home treatment. The special sche has attracted many members, and another s covers boys and girls at boarding-schools. The association, which was set up in 1943, now a under £50,000. Further information may be secretary, Tavistock House (South), Tavistock Sq

MEDICAL LIBRARIES IN HOSPITA

THE medical section of the Library Associat open meeting in London on Dec. 16 at which me committee which drew up the hints on medical hospitals[1] and the book-list for hospital libraries Mr. C. C. Barnard (librarian, *London School* of Tropical Medicine), who presided, said that f publication of the note in THE LANCET, over th requests had been received for the reprint and bo hospitals all over Britain and from Australia, C Zealand, South Africa, the U.S.A., India, Mal France, Germany, Sweden, and Siam. Mr. F. N. (assistant librarian, Wellcome historical medi suggested that doctors in hospitals should dem library service as a right. Speaking of the unus in medical libraries, the hon. secretary of the sectio Bishop, librarian, Wellcome library) said that it wa experience for the big medical libraries in Lond say, sets of THE LANCET to Newcastle, which h as almost as bad as sending coals there. Copies and book-list may be obtained from the hon. medical section of the Library Association, Wellcom Medical Library, 183, Euston Road, London, N.

ELASTIC ADHESIVE BANDAGES B.P.

THE Ministry of Health announces that produc of the two packs of these bandages hitherto in use continued from Jan. 1, 1950. From this date st carton "N.H.S." pack may be dispensed wh adhesive bandage is ordered on E.C.10 prescription supplies of this pack are being exhausted. The c is being replaced by a pack in tin containers, to prominently with the title "Elastic Adhesive *B.P.C.*" Since this pack may in fact be the pack manufacturers for their branded product, the brand name or trade mark of the manufacturer appear on the tin. The prices included in the Jan *Tariff* for the two widths of this bandage will be for this new tin pack. Whether the carton or th has been dispensed, these prices will be paid unt after which the bandage in the tin container may be only against orders on E.C.10. For 'Diachy bandages the tin container will be of distinctive col

INTERNATIONAL BUREAU FOR MEDICAL V

THE British Medical Association has set up a its headquarters in Tavistock Square, London, help visiting doctors who come from countries o Commonwealth. Like the Empire Medical Adviso already established for doctors from the Comm the new bureau will be able to tell visitors about po lectures, demonstrations, and courses, and to hel arrange visits to hospitals and clinics. Where ne will help them to find living accommodation, and i give information about food-rationing and petrol to visitors who are happily unfamiliar with these f At the bureau, too, the visitor will be able to fi he can most easily get a game of tennis or golf, for a theatre or concert. Dr. H. A. Sandiford, direc Empire bureau, will also be in charge of the int bureau.

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[1] *Lancet*, Sept. 3, p. 130.